

PS3.20

**DICOM PS3.20 ~~2017e~~2017d - Imaging Reports using
HL7 Clinical Document Architecture**

PS3.20: DICOM PS3.20 ~~2017e~~2017d - Imaging Reports using HL7 Clinical Document Architecture

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Foreword

This DICOM Standard was developed according to the procedures of the DICOM Standards Committee.

The DICOM Standard is structured as a multi-part document using the guidelines established in [ISO/IEC Directives, Part 2].

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1 Scope and Field of Application

This part of the DICOM Standard specifies templates for the encoding of imaging reports using the HL7 Clinical Document Architecture Release 2 (CDA R2, or simply CDA) Standard. Within this scope are clinical procedure reports for specialties that use imaging for screening, diagnostic, or therapeutic purposes.

This Part constitutes an implementation guide for CDA, and is harmonized with the approach to standardized templates for CDA implementation guides developed by HL7. It also provides Business Names for data elements that link data in user terminology, e.g., collected by a report authoring application, to specific CDA encoded elements.

As an implementation guide for imaging reports, particular attention is given to the use and reference of data collected in imaging procedures as explicit evidence within reports. This data includes images, waveforms, measurements, annotations, and other analytic results managed as DICOM SOP Instances. Specifically, this Part includes a specification for transformation into CDA documents of DICOM Structured Report instances that represent imaging reports.

2 Normative and Informative References

The following standards contain provisions that, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibilities of applying the most recent editions of the standards indicated below.

[ISO/IEC Directives, Part 2] ISO/IEC. 2016/05. 7.0. *Rules for the structure and drafting of International Standards*. http://www.iec.ch/members_experts/refdocs/iec/isoiecdir-2%7Bed7.0%7Den.pdf.

ANSI/HL7 CDA®, R2-2005 HL7 Version 3 Standard: Clinical Document Architecture (CDA) Release 2, 2005 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7)

CDA® is a registered trademark of HL7 International.

ANSI/HL7 V3 CPPV3MODELS, R1-2012 HL7 Version 3 Standard: Core Principles and Properties of Version 3 Models, Release 1 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=58)

ANSI/HL7 V3 CMET, R2-2009 Health Level Seven Version 3 Standard: Common Message Element Types, Release 2, 2009.

ANSI/HL7 V3 DT, R1-2004 HL7 Version 3 Data Types Abstract Specification, Release 1 - November 2004. [Note: this specific release version is required by CDA R2]

ANSI/HL7 V3 XMLTSDT, R1-2004 HL7 Version 3 XML Implementation Technology Specification - Data Types, Release 1 - April 2004. [Note: this specific release version is required by CDA R2]

HL7 CDA R2 DIR IG, R1-2009 Health Level Seven Implementation Guide for CDA Release 2: Imaging Integration, Basic Imaging Reports in CDA and DICOM, Diagnostic Imaging Reports (DIR) Release 1.0 - Informative, 2009 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=13)

HL7 CDAR2_IG_IHE_CONSOL HL7 Implementation Guide for CDA® Release 2: IHE Health Story Consolidation, Release 1.1 - US Realm, Draft Standard for Trial Use, July 2012 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=258)

HL7 CDAR2_IG_CCDA_CLINNOTES_R2 HL7 Implementation Guide for CDA® Release 2: Consolidated CDA Templates for Clinical Notes, Release 2 - US Realm, Draft Standard for Trial Use, November 2014 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=379)

HL7 CDAR2_IG_GREENMOD4CCD HL7 Implementation Guides for CDA® R2: greenCDA Modules for CCD®, Release 1 - Informative, April 2011(http://www.hl7.org/implement/standards/product_brief.cfm?product_id=136)

HL7 Templates HL7 Templates Standard: Specification and Use of Reusable Information Constraint Templates, Release 1 - DSTU, October 2014 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=377)

HL7 CDA Digital Signatures HL7 Implementation Guide for CDA® Release 2: Digital Signatures and Delegation of Rights, Release 1 - DSTU, October 2014 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=375)

HL7 v3-2014 HL7 Version 3 Interoperability Standards, Normative Edition 2014 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=362)

IHE Card Sup CIRC IHE Cardiology Technical Framework Supplement, Cardiac Imaging Report Content, Trial Implementation, July 2011 (http://www.ihe.net/Technical_Frameworks/#cardiology)

IHE ITI TF IHE IT Infrastructure Technical Framework, Revision 11.0, September 2014 (http://www.ihe.net/Technical_Frameworks/#ITI)

IHE PCC TF IHE Patient Care Coordination Technical Framework, Revision 10.0, November 2014 (http://www.ihe.net/Technical_Frameworks/#pcc)

IHE RAD TF IHE Radiology Technical Framework, Revision 13.0, July 2014 (http://www.ihe.net/Technical_Frameworks/#radiology)

LOINC Logical Observation Identifier Names and Codes, Regenstrief Institute, Indianapolis 2013.

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RFC4646 Tags for Identifying Languages, The Internet Society, 2005

SNOMED CT® Systematized Nomenclature of Medicine - Clinical Terms, International Release, International Health Terminology Standards Development Organisation (IHTSDO), January 2015

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UCUM Unified Code for Units of Measure, Regenstrief Institute, Indianapolis 2013.

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XML Extensible Markup Language (XML) 1.0 (Fifth Edition), World Wide Web Consortium, 2008 (<http://www.w3.org/TR/REC-xml/>)

XML Schema Datatypes XML Schema Part 2: Datatypes Second Edition, World Wide Web Consortium, 2004 (<http://www.w3.org/TR/xmlschema-2/>)

xml:id xml:id Version 1.0, World Wide Web Consortium, 2005 (<http://www.w3.org/TR/xml-id>)

XPath XML Path Language (XPath), Version 1.0, World Wide Web Consortium, 1999 (<http://www.w3.org/TR/xpath/>)

3 Definitions

For the purposes of this Standard the following definitions apply.

3.1 Codes and Controlled Terminology Definitions:

The following definitions are commonly used in this Part of the DICOM Standard:

| | |
|--------------------------|---|
| Context Group | A set of coded concepts defined by a Mapping Resource forming a set appropriate to use in a particular context. |
| Context ID (CID) | Identifier of a Context Group. |
| Template | A pattern that describes the Content Items, Value Types, Relationship Types and Value Sets that may be used in part of a Structured Report content tree, or in other Content Item constructs, such as Acquisition Context or Protocol Context. Analogous to a Module of an Information Object Definition. |
| Template ID (TID) | Identifier of a Template. |
| Coding Schemes | Dictionaries (lexicons) of concepts (terms) with assigned codes and well defined meanings. |

3.2 Vocabulary Model Definitions:

The following terms used in this Part of the DICOM Standard are defined in HL7 Core Principles and Properties of Version 3 Models:

| | |
|---------------------------|--|
| Concept Domain | A named category of like concepts (a semantic type) that is specified in the vocabulary declaration of an attribute in an information model. It constrains the intent of the coded element while deferring the binding of the element to a specific set of codes until later in the specification process. |
| Value Set | A uniquely identifiable set of valid concept identifiers. Value sets constrain the permissible content for a coded element in an information model or data type specification. |
| Vocabulary Binding | The mechanism of identifying specific codes to be used to express the semantics of coded model elements in information models or coded data type properties. Vocabulary Binding may bind the coded element or data type property to a single fixed value code, or may bind it to a Value Set Assertion. |

3.3 Template Definitions

The following term used in this Part of the DICOM Standard is defined in the HL7 Templates Standard, and applies to CDA template specifications:

| | |
|-----------------|--|
| Template | A set of conformance statements which further constrain an existing information model. |
|-----------------|--|

3.4 Imaging Report Definitions

The following definitions apply to terms used in this Part of the Standard:

| | |
|----------------------|--|
| Business Name | Identifier for a CDA Data Element, Attribute, or structure of Data Elements that corresponds to a business requirement for information exchange. |
|----------------------|--|

4 Symbols and Abbreviations

The following symbols and abbreviations are used in this Part of the Standard.

| | |
|---------------|--|
| ANSI | American National Standards Institute |
| CDA | Clinical Document Architecture (HL7) |
| DICOM | Digital Imaging and Communications in Medicine |
| HL7 | Health Level 7 |
| HMD | Hierarchical Message Description (HL7) |
| IE | Information Entity |
| IHE | Integrating the Healthcare Enterprise |
| IOD | Information Object Definition |
| ISO | International Standards Organization |
| LOINC | Logical Observation Identifiers Names and Codes |
| MRRT | IHE Management of Radiology Report Templates Profile |
| NEMA | National Electrical Manufacturers Association |
| OID | Object Identifier (ISO 8824) |
| RSNA | Radiological Society of North America |
| SNOMED | Systematized Nomenclature of Medicine |
| SR | Structured Reporting |
| UCUM | Unified Code for Units of Measure |
| UID | Unique Identifier |
| XML | Extensible Markup Language |

The following symbols and abbreviations for HL7 v3 Data Types are used in this Part of the Standard.

| | |
|---------------------|------------------------|
| AD | Postal Address |
| CE | Coded With Equivalents |
| CD | Concept Descriptor |
| CS | Coded Simple Value |
| ED | Encapsulated Data |
| EN | Entity Name |
| II | Instance Identifier |
| INT | Integer Number |
| IVL<> | Interval |
| LIST<> | List |

| | |
|-------------|-------------------------------|
| OID | ISO Object Identifier |
| ON | Organization Name |
| PN | Person Name |
| PQ | Physical Quantity |
| REAL | Real Number |
| ST | Character String |
| TEL | Telecommunication Address |
| TS | Point in Time |
| UID | Unique Identifier String |
| URL | Universal Resource Identifier |

5 Conventions

5.1 Template Metadata

Each template has a set of metadata, as specified in the HL7 Templates Specification. The metadata is presented as a table, as shown in Table 5.1-1.

Table 5.1-1. Template metadata table format

| | |
|-------------------------|---|
| Template ID | OID (see Section 5.1.1) |
| Name | |
| Effective Date | |
| Version Label | (see Section 5.1.1) |
| Status | "draft", "active", "review" or "retired" |
| Description | |
| Classification | type of the template, e.g., CDA Section Level |
| Relationships | relationships to other templates or model artifacts |
| Context | "parent node", "sibling node" (see Section 5.1.2) |
| Open/Closed | "open", "closed"(see Section 5.1.3) |
| Revision History | |

5.1.1 Template IDs and Version

Template identifiers (templateId) are assigned for each document, section, and entry level template. When valued in an instance, the template identifier signals the imposition of a set of template-defined constraints. The value of this attribute (e.g., @root="2.16.840.1.113883.10.20.22.4.8") provides a unique identifier for the template in question.

A template may be further qualified by a version label. This label may be used as the extension attribute of the templateId (e.g., @extension="20150309"). All versions of a template, regardless of the version label, must be compatible; i.e., they may vary only by optional content conformance requirements. Thus the version label is typically not used as a conformance constraint.

Within this Standard, template versions are identified by the string "DICOM" and the date of adoption (represented as YYYYMMDD), separated by a hyphen (e.g., DICOM-20150523).

5.1.2 Context

As described in the HL7 Template specification section 2.9.9.4, the context identifies whether the template applies to the parent node in which the templateId is an element, or applies to its sibling nodes in the template table. These typically are applied respectively to templates with a single parent element with child element structure, and to templates with flat list of sibling elements (see Section 5.2.8).

5.1.3 Open and Closed Templates

Each template is defined as being either "open" or "closed". In "open" templates, all of the features of the CDA Specification are allowed except as constrained by the templates. By contrast, a "closed" template specifies everything that is allowed and nothing further may be included.

5.2 Template Table Structure

Each template is specified in tabular form, as shown in Table 5.2-1.

Table 5.2-1. Template table format

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------------|------------|-------------------|------|----------------|-----------|------------|-------|---------------------|
| ScopingBusinessName | | | | | | | | |
| ElementBusinessName | | | | | | | | |
| <i>ReferencedBusinessName</i> | | | | | | | | |

5.2.1 Business Name

This Part uses Business Names to identify and map common data elements from clinical imaging reports into the proper context-specific CDA/XML structure.

A Business Name is assigned to each element or attribute that may have a user-specified value assigned in the production of the clinical document instance. Business Names are specified to facilitate the implementation of production logic for clinical report authoring applications. The benefit is that developers of clinical report authoring applications are not required to have an in depth knowledge of CDA, the HL7 v3 R-MIM data model, or the XML structures. The use of readable and intuitive Business Names provides a method of direct access to insert data that is specific to each clinical report instance.

Note

Business Names are also described in the HL7 greenCDAModules for CCD specification, but that specification implies the use of a specific XML structure for production logic that is not required by this Part. The specification of production logic using Business Names is outside the scope of this Part.

Business Names are not specified for elements that are expected to receive an automatically generated value, e.g., the id element for each document, section, and entry.

As a convention, Business Names are represented in CamelCase (alternating upper and lower case, no spaces, initial letter in upper case) in the Business Name column of the template tables.

Business Names are hierarchically organized, and contextually scoped by higher level Business Names.

- Data element/attribute level Business Names are shown in normal font
- Business Names that provide scoping for subsidiary Business Names are shown in bold font.
- Referenced Business Names from included templates are shown in italic (see Section 5.2.9)
- As a convention, hierarchical relationship between Business Names is shown with the : character.

Scoping Business Names scope all attributes and elements subsidiary to the element to which the name is assigned.

Examples:

- The top level scoping Business Name for an Imaging Report is "ImagingReport", and it scopes all attributes and elements in the document, i.e., including and subsidiary to the <ClinicalDocument> XML element
- The Business Name for the 9.2 Clinical Information report section is "ImagingReport:ClinicalInformation", and it scopes all attributes and elements including and subsidiary to the <section> XML element in template 1.2.840.10008.9.2
- The Business Name for the text element of the 9.2 Clinical Information report section is "ImagingReport:ClinicalInformation:Text"
- The Business Name for the text element of the 9.6 Impression section is "ImagingReport:Impression:Text"

Note that both 9.2 Clinical Information and 9.6 Impression define a Business Name "Text", but these are distinguished by their hierarchical location under the scoping Business Names of their respective sections.

5.2.1.1 Multiple Instantiations

Some templates may be invoked multiple times in a document instance; for example, the 10.5 Quantity Measurement template is instantiated for each numeric measurement in a report. Each instantiation shall have an identifying string, unique within the document, used as a discriminator between those multiple instantiations. The Business Name for each element that may have multiple instantiations has a suffix [*], indicating the use of a discriminator string. This allows Business Name based production logic for authoring applications to identify specific instances of an element.

Example 5.2.1.1-1. Example Business Name based production logic with discriminators for two measurements

```
-- "Q21a" is the discriminator for the first measurement
-- "Q21b" is the discriminator for the second measurement
ImagingReport:Findings:QuantityMeasurement[Q21a]:MeasurementName = ("112058", "DCM", "Calcium score")
ImagingReport:Findings:QuantityMeasurement[Q21a]:MeasurementValue = "8"
ImagingReport:Findings:QuantityMeasurement[Q21a]:MeasurementUnits = "[arb'U]"
ImagingReport:Findings:QuantityMeasurement[Q21b]:MeasurementName = ("408716009", "SNOMED", "Stenotic lesion length")
ImagingReport:Findings:QuantityMeasurement[Q21b]:MeasurementValue = "14"
ImagingReport:Findings:QuantityMeasurement[Q21b]:MeasurementUnits = "mm"
```

The discriminator string shall be conformant to XML Name production requirements, as used for the XML ID attribute (see Section 5.3.4 on the use of XML ID).

Some CDA elements may include an XML ID attribute. This attribute is identified by '*' (asterisk) as its Business Name, and its value shall be the discriminator string.

5.2.1.2 Implicit Element Structure For Business Name

A Business Name may be associated with an element subsidiary to another element that does not have an associated Business Name. In such a case, when the element with the Business Name is instantiated in a document, its entire parent element hierarchy must be instantiated, even if those elements are identified as optional.

Note

For example, in the 8.1 General Header template, if Recipient:Name is instantiated, the entire hierarchical structure of informationRecipient/intendedRecipient/informationRecipient/name must be instantiated to hold the name element content.

5.2.2 Nesting Level

CDA documents are encoded using the Extensible Markup Language (XML), and are marked up through hierarchically nested XML elements (tags). The Nesting Level column of the template tables identifies the hierarchical level of each element relative to the other elements in the table using the character right angle bracket '>'. Multiple levels of nesting are identified by multiple > characters.

XML elements may have attributes, encoded as "<name>=<value>" pairs within the element tag. Such attributes are identified using the character at sign '@'.

5.2.3 Element/Attribute Names and XPath Notation

The name of each XML element and attribute used in a CDA document for which specific constraints are applied is shown in the Element/Attribute column of the template tables. Optional elements whose use is not specified nor constrained are not shown.

Elements and attributes that use the default value specified in CDA Specification are not shown. For example, the Section element has default attributes classCode='DOCSECT' and moodCode='EVN'; these are not listed in the templates. In accordance with the HL7 v3 specification, attributes with default values need not be included in instances, and their absence implies the default value.

XML Path Language (XPath) notation is used to identify the XML elements and attributes within the CDA document instance to which various constraints are applied. The implicit context of these expressions is the root node of the document, and traversing the path

to the root node of the relevant template. This notation provides a mechanism that will be familiar to developers for identifying parts of an XML document.

XPath syntax selects nodes from an XML document using a path containing the context of the node(s). The path is constructed from node names and attribute names (prefixed by a '@') and concatenated with a '/' symbol.

Example 5.2.3-1 is an example of a fragment of a CDA document.

Example 5.2.3-1. XML document example

```
<author>
  <assignedAuthor>
    ...
    <code codeSystem='2.16.840.1.113883.6.96' codeSystemName='SNOMED CT'
      code='17561000' displayName='Cardiologist' />
    ...
  </assignedAuthor>
</author>
```

Table 5.2.3-1 is an example of a fragment of a template specification table.

Table 5.2.3-1. Template element and attribute example

| ... | Nest Level | Element/Attribute | ... |
|-----|------------|-------------------|-----|
| | | author | |
| | > | assignedAuthor | |
| ... | | | |
| | >> | code | |
| | >>@ | @codeSystem | |
| | >>@ | @codeSystemName | |
| | >>@ | @code | |
| | >>@ | @displayName | |
| ... | | | |

In Table 5.2.3-1, the code attribute of the code element could be selected with the XPath expression `author/assignedAuthor/code/@code`.

5.2.4 Cardinality

Each element/attribute has a cardinality indicator that specifies the number of allowable occurrences within a template instance. The cardinality indicators are interpreted with the following format "m...n" where m represents the least and n the most:

- 0..1 zero or one
- 1..1 exactly one
- 1..* at least one
- 0..* zero or more
- 1..n at least one and not more than n
- 0..0 none [SHALL NOT]

5.2.5 Element/Attribute Conformance

Each element/attribute has a conformance verb (keyword) in addition to the cardinality constraint.

The keywords SHALL, SHOULD, MAY, SHOULD NOT, SHALL NOT, and NEED NOT in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Annex H "Verbal forms for the expression of provisions":

- SHALL: an absolute requirement
- SHALL NOT: an absolute prohibition against inclusion
- SHOULD/SHOULD NOT: a best practice or recommendation. There may be valid reasons to ignore a recommendation, but the full implications must be understood and carefully weighed before choosing to not adhere to the best practice.
- MAY/NEED NOT: truly optional; can be included or omitted at the discretion of the content creator with no conformance implications

The keyword SHALL is associated with a minimum cardinality of at least 1; other keywords have a minimum cardinality of 0. If an element is required by SHALL, but is not known (and would otherwise be omitted without the SHALL requirement), it must be represented by a nullFlavor. SHALL allows the use of nullFlavor unless the requirement is on an attribute (nullFlavor does not apply to attributes), or the use of nullFlavor is explicitly precluded (see Section 5.2.7 Value Conformance and Section 5.3.2 Null Flavor).

Within the template, the keyword COND (conditional) may be present. In this case, the specification of the condition, and the conformance verbs associated with the condition being true or false, are described below the table in a paragraph flagged with the COND keyword.

In an open template, additional elements and attributes allowed by the CDA Specification are not precluded by template constraints, unless there are applicable SHALL NOT template specifications.

5.2.6 Data Type

The data type associated with each element/attribute is specified, as described in the CDA Specification and its referenced HL7v3 Data Types Release 1. Elements that are simply tags with subsidiary content only of nested elements, e.g., RIM class clone names, have the Data Type column empty.

Many data types are non-primitive, and may include constituent component elements and/or attributes. Such subsidiary components are not specified in the templates unless specific constraints are to be applied to them.

5.2.7 Value Conformance

The template table may constrain values or vocabularies to be used with an element or attribute. Value constraints include a conformance verb (SHALL, SHOULD, MAY, etc.) as defined in Section 5.2.5, and specified in the Value Conformance column of the template tables.

Elements for which nullFlavor is forbidden are indicated with an additional constraint keyword noNull.

Additionally, constraints specifying Value Sets include a coding strength conformance CWE (Coded With Extensibility) or CNE (Coded with No Extensibility), as defined in Core Principles and Properties of HL7 Version 3 Models, Release 1.

Further, Value Set constraints can be static, meaning that they are bound to a specified version of a Value Set, or dynamic, meaning that they are bound to the most current version of the Value Set. By default, Value Sets have dynamic binding, unless explicitly specified with an additional constraint keyword static.

5.2.8 Value Specification

The template table may constrain values to a single fixed value, to a Value Set from which the value is to be drawn, or to a named Concept Domain. It may non-normatively reference a mapping from a DICOM SOP Instance or an HL7 message.

The template table may contain elements without a value specification, and without a Business Name. These are typically id elements. The application creating the document instance shall fill these elements with appropriate values.

5.2.8.1 Coded Simple Value

Values of Data Type CS (Coded Simple Value) have a fixed code system defined in the CDA Specification, and are simple strings. The template tables identify only the constraint on the code value, and do not specify the fixed code system nor the code meaning (display name), which are not encoded in the CDA instance.

5.2.8.2 Concept Descriptor and Coded With Equivalents

Single values of Data Type CD (Concept Descriptor) or CE (Coded With Equivalents) are specified in the template tables with the triplet notation specified in PS3.16:

(CodeValue, Coding Scheme Designator, "Code Meaning")

The Coding Scheme Designator is a simple human readable identifier of the code system, and corresponds to the optional codeSystemName attribute of the CD or CE element. The CDA Specification requires the Code System OID to be encoded in the codeSystem attribute of the CD or CE element. The corresponding OID for each Coding Scheme Designator is provided in Annex 8 "Coding Schemes" in PS3.16. The Code Meaning is encoded in the displayName attribute of the CD or CE element.

5.2.8.3 Value Set

Elements whose value may be drawn from a Value Set will have that Value Set identified in the Value column introduced by the keyword ValueSet.

5.2.8.4 Concept Domains

Concept Domains (see definition in Section 3.2) are used to provide a named category in a structural template that can be bound to a specific value or value set by an invoking template, thus specializing the structural template for a particular use case. Concept Domain names are introduced by the keyword ConceptDomain in the Value column. For example, the 10.5 Quantity Measurement template Concept Domain "observationType" might be bound to a value set of fetal ultrasound measurements in one invoking template, or to a value set of cardiac CT measurements in another invoking template.

Concept Domain names are similar to element Business Names in that they provide a public interface that is bound to specific values later in the document specification and production process. Concept Domains do not have a Value Conformance verb; the conformance verb is specified when the Concept Domain is bound to a specific value or value set (see Section 5.2.9.1).

5.2.8.5 Mapping From DICOM SOP Instances and HL7v2 Messages

Elements whose value may be mapped from a DICOM SOP Instance or from an HL7v2 message have the source attribute name and tag identified in the Value column in *italic font*. Note that many of these values have their origin in IT systems outside the imaging department, and there may be alternate routes for these values to be accessed by the reporting application, e.g., from an HL7 FHIR web service.

Note

Due to differences in use of HL7v2 data elements, mappings should not be considered normative.

Data mapped from a specific Attribute in the interpreted DICOM image(s) is identified by the Attribute Name and Tag, represented in the mapping as:

Attribute Name (gggg,eeee)

Data mapped from Attributes within sequences is identified with the > character:

Sequence Attribute Name (ggg0,eee0) > Item Attribute Name (ggg1,eee1)

Data mapped from an HL7v2 field in the order for the study is identified by the Element Name and Segment Field identifier:

Element Name seg-n

The mapping of the value typically requires a transformation from the DICOM Value Representation or the HL7v2 Data Type representation to the CDA Data Type encoding. For example, transforming a DICOM Code Sequence attribute or an HL7v2 CWE field to a CD or CE Data Type requires a look up of the Coding Scheme OID.

5.2.9 Subsidiary Templates

A template may include subsidiary templates. Templates typically have one of two styles, a single parent element with child element structure, or a flat list of sibling elements.

The single parent element style is typical for the top level Document, Section, and Entry templates, and the parent element is of the HL7 v3 RIM act class. Inclusion of such a template therefore involves an actRelationship element; that actRelationship element is specified in the invoking template.

The sibling elements style is typical for sets of elements and attributes aggregated for editorial convenience.

Inclusion of a subsidiary template includes the name of included template and its templateID, specified in the Subsidiary Template column of the invoking template table.

For an included template of the single parent element style, the scoping business name and top level element are provided in italics in the invoking template table. This indicates this is data copied from the specification in the included template for the reader's convenience.

5.2.9.1 Vocabulary Binding and Constraints

A template inclusion may provide Concept Domain Vocabulary Binding or other vocabulary constraints, e.g., limiting an element in the included template to a specific value from its defined Value Set. These vocabulary constraints are specified in tabular form, as shown in Table 5.2.9.1-1. The table is included in the additional requirements for the template, with a reference in the Value column of the template entry invoking the subsidiary template. The Value Conformance and Value specification columns are interpreted as in the templates tables.

Table 5.2.9.1-1. Vocabulary Binding Table Format

| Concept Domain or Element | Value Conf | Value |
|---------------------------|------------|-------|
| ... | ... | ... |

5.2.10 Additional Requirements

Each template may be accompanied by additional requirements and usage explanations in narrative specification language.

5.3 Encoding

A full discussion of the representation of data types and vocabulary is outside the scope of this document; for more information, see the HL7 V3 specifications on Abstract Data Types R1 and XML Data Types R1 referenced in the CDA Specification.

Note

1. Many Data Types encode their values in attributes, rather than character data. For example, the URL Data Type encodes its value in the **value** attribute within the element tag, e.g., <reference value="http://xyz.org">. Within this specification, the attribute(s) that hold the value are not identified, except where specific constraints apply.
2. The Consolidated CDA specification includes extensive examples of valid and invalid encodings, which may be useful for implementers.
3. The specification of a representation of Data Types for use in Business Name-based report production logic is outside the scope of this Standard.

5.3.1 Translation Code Element

HL7 Data Types CD (Concept Descriptor) and CE (Coded With Equivalents) allow a translation code element, which allows the encoding of the same concept in an alternate coding system. This supports the encoding of both an originally entered (local) code, and a code specified for cross-system interoperability.

This Part follows the convention used in the Consolidated CDA Implementation Guide specification, which specifies the standard interoperable code in the root, whether it is original or a translation. The HL7v3 Data Types R1 standard included by CDA formally specifies the original code (as initially entered in an information system application) to be placed in the root.

Note

This discrepancy is resolved in HL7v3 Data Types R2 to follow the convention used here, and the HL7 Structured Documents Working Group has approved the "pre-adoption" of the Data Types R2 approach in CDA implementations.

Example 5.3.1-1. Translation code example

```
<code code='206525008'
  displayName='neonatal necrotizing enterocolitis 'codeSystem='2.16.840.1.113883.6.96'
  codeSystemName='SNOMED CT'>
  <translation code='NEC-1'
    displayName='necrotizing enterocolitis'
    codeSystem='2.16.840.1.113883.19'/>
</code>
```

5.3.2 Null Flavor

Information technology solutions store and manage data, but sometimes data are not available: an item may be unknown, not relevant, or not computable or measurable. In HL7 v3, a flavor of null, or nullFlavor, describes the reason for missing data.

For example, if a patient arrives at an Emergency Department unconscious and with no identification, a null flavor is used to represent the lack of information. The patient's birth date could be represented with a null flavor of "NAV", which is the code for "temporarily unavailable". When the patient regains consciousness or a relative arrives, we expect to be able to obtain the patient's birth date.

Example 5.3.2-1. nullFlavor example

```
<birthTime nullFlavor="NAV"/> <!--coding an unknown birthdate-->
```

Use null flavors for unknown, required, or optional attributes:

- NI** No information. This is the most general and default null flavor.
- NA** Not applicable. Known to have no proper value (e.g., last menstrual period for a male).
- UNK** Unknown. A proper value is applicable, but is not known.
- ASKU** Asked, but not known. Information was sought, but not found (e.g., the patient was asked but did not know).
- NAV** Temporarily unavailable. The information is not available, but is expected to be available later.
- NASK** Not asked. The patient was not asked.
- MSK** Masked. There is information on this item available but it has not been provided by the sender due to security, privacy, or other reasons. There may be an alternate mechanism for gaining access to this information.

OTH Other. The actual value is not an element in the value domain of a variable. (e.g., concept not provided by required code system).

The above null flavors are commonly used in clinical documents. For the full list and descriptions, see the nullFlavor vocabulary domain in the HL7 v3 Vocabulary referenced by the CDA specification.

Any SHALL conformance requirement on an element may use nullFlavor, unless nullFlavor is explicitly disallowed (as indicated by noNull, see Section 5.2.7 Value Conformance). SHOULD and MAY conformance requirements may also use nullFlavor. nullFlavor does not apply to conformance requirements on attributes.

The encoding of nullFlavor as an attribute of the data type element is not shown in the templates, hence there is no business name associated with the attribute.

Note

Production logic based on Business Names needs to provide a mechanism for assignment of a value to the nullFlavor attribute as an alternative for a value for the element. Specification of such production logic is outside the scope of this Standard.

Example 5.3.2-2. XML example of allowed nullFlavors when element is required

```
<entry>
  <observation classCode="OBS" moodCode="EVN">
    <id nullFlavor="NI"/>
    <code nullFlavor="OTH">
      <originalText>New Grading system</originalText>
    </code>
    <statusCode code="completed"/>
    <effectiveTime nullFlavor="UNK"/>
    <value xsi:type="CD" nullFlavor="NAV">
      <originalText>Spiculated mass grade 5</originalText>
    </value>
  </observation>
</entry>
```

5.3.3 Unknown Information

If a document creator wants to state that a piece of information is unknown, the following principles apply:

1. If the creator doesn't know an attribute of an act, that attribute can be null.

Example 5.3.3-1. Unknown medication example

```
<text>patient was given a medication but I do not know what it was</text>
<entry>
  <substanceAdministration moodCode="EVN" classCode="SBADM">
    <consumable>
      <manufacturedProduct>
        <manufacturedLabeledDrug>
          <code nullFlavor="NI"/>
        </manufacturedLabeledDrug>
      </manufacturedProduct>
    </consumable>
  </substanceAdministration>
</entry>
```

2. If the creator doesn't know if an act occurred, the nullFlavor is on the act (detail could include specific allergy, drug, etc.).

Example 5.3.3-2. Unknown medication use of anticoagulant drug example

```
<text>I do not know whether or not patient received an anticoagulant drug</text>
<entry></para>
  <substanceAdministration moodCode="EVN" classCode="SBADM" nullFlavor="NI">
    <consumable>
      <manufacturedProduct>
        <manufacturedLabeledDrug>
          <code code="81839001" displayName="anticoagulant drug"
            codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT"/>
        </manufacturedLabeledDrug>
      </manufacturedProduct>
    </consumable>
  </substanceAdministration>
</entry>
```

3. If the sender wants to state 'no known', a negationInd can be used on the corresponding act (substanceAdministration, Procedure, etc.)

Example 5.3.3-3. No known medications example

```
<text>No known medications</text>
<entry>
  <substanceAdministration moodCode="EVN" classCode="SBADM" negationInd="true">
    <consumable>
      <manufacturedProduct>
        <manufacturedLabeledDrug>
          <code code="410942007" displayName="drug or medication"
            codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT"/>
        </manufacturedLabeledDrug>
      </manufacturedProduct>
    </consumable>
  </substanceAdministration>
</entry>
```

Other CDA implementation guides recommended using specific codes to assert no known content, for example SNOMED CT 160244002 "No known allergies" or 160245001 "No current problems or disability". Specific codes are still allowed; however, use of negationInd is an alternative, and the specific approach for each use will be specified in the associated template.

5.3.4 XML ID

The XML Specification allows a markup tag to have an attribute of type ID, whose value is unique within the document, that allows reference to that markup. The CDA schema defines such attributes with attribute name ID.

Note

1. Thus the attribute named ID is of XML attribute type ID. This must further be distinguished from the element named id of HL7v3 Data Type UID that is part of most RIM classes. The attribute name is always upper case, the element name is always lower case.
2. The actual CDA schema specification uses the XML Schema Datatypes definition of XML ID (xs:ID). Readers may also be familiar with the xml:id specification, which is not formally used by CDA as it was published after the CDA specification.

In the CDA R2 Specification, the XML ID attribute capability is applied to the Section and observationMedia elements, and to various types of narrative block markup, and is used to provide linkage between structured entries and the corresponding narrative text (see Section 9.1.1 Section Text).

5.4 Extension and Namespace

In accordance with CDA R2 (and HL7 v3 XML) extensibility rules, as described in CDA R2 Section 1.4, "locally-defined" XML markup may be specified where there is a need to communicate information for which there is no suitable representation in CDA R2. These extensions are described in the context of the templates where they are used. All such extensions use HL7 v3 Data Types used by CDA R2.

Note

The HL7 Structured Documents Working Group coordinates markup extensions that have been defined for implementation guides published by HL7, IHE, DICOM, and other organizations. See http://wiki.hl7.org/index.php?title=CDA_R2_Extensions

The namespace for extensions defined in this standard is "urn:dicom-org:ps3-20", which is aliased in this standard as "ps3-20". Extensions defined in this standard are:

- ps3-20:accessionNumber - The accessionNumber extension allows for the clear identification of the imaging department identifier for a service request (order). While this identifier could be conveyed as another id for the inFulfillmentOf/Order element, there is no reliable way in that context to distinguish it from the Placer Order Number. As this is a primary management identifier in departmental workflows, a distinct local markup is defined. This extension uses the II Data Type.

The namespace for extensions defined by HL7 is "urn:hl7-org:sdtc". which is aliased in this standard as "sdtc". HL7 defined extensions used in this standard are:

- sdtc:signatureText - Provides a location for a textual or multimedia depiction of the signature by which the participant endorses and accepts responsibility for his or her participation in the Act as specified in the Participation.typeCode. Details of the element content are described in the HL7 CDA Digital Signature Standard. This extension uses the ED Data Type.

5.5 Serialization Order of Elements

The CDA schema requires elements to be encoded in a specified order, which may be different than the order in which they are described in the templates. The serialization of elements shall be in accordance with the HL7 CDA Hierarchical Description. In particular, attention must be paid to the serialization order of elements defined in sibling templates (see Section 5.1.2).

Note

For example, the various header templates are siblings, specifying sets of elements at the same hierarchical level. These elements of different templates must be encoded in their appropriate serialized order in the object instance - all templateID elements from the document template and all header templates first, followed by the elements of the clinicalDocument class in their prescribed order, followed by the participations in their prescribed order, followed by act relationships in their prescribed order.

6 Conformance

The CDA specification section 1.3 provides conformance requirements for Document Originators and Document Recipients.

Note

1. Consolidated CDA Implementation Guide Section 2.8 includes recommended best practices for Document Recipients displaying CDA documents.
2. There may be other CDA-related standards to which an application may claim conformance. For example, IHE Patient Care Coordination Technical Framework specifies a Document Consumer actor with four options for conformance.

A CDA document instance in accordance with this Standard asserts its conformance to a template by inclusion of the specified templateID elements in the document, sections, and entries.

7 Document-level Templates

Document-level templates describe the purpose and rules for constructing a conforming CDA document. Document templates include constraints on the CDA header and sections by referring to templates, and constraints on the vocabulary used in those templates.

7.1 Imaging Report

| | |
|-------------------------|---|
| Template ID | 1.2.840.10008.9.1 |
| Name | Imaging Report |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | <p>This CDA Imaging Report document template defines the report content and technical constraints for top level elements, attributes, sections, and entries to be used in imaging report instances. This template may apply to screening, diagnostic, or therapeutic radiology, cardiology, or other imaging reports.</p> <p>The body of an Imaging Report may contain five main imaging report sections:</p> <ul style="list-style-type: none"> • Clinical information (optionally); • Current imaging procedure description; • Comparison studies (optionally); • Findings (optionally); • Impression; • plus potentially an Addendum(s) <p>The report templates sponsored by the RSNA Radiology Reporting Initiative (http://www.radreport.org) adhere to this general section outline.</p> |
| Classification | CDA Document Level |
| Relationships | |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------|------------|-------------------|------|----------------|-----------|------------------------|---|--|
| Imaging Report | | Clinical Document | | | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.1 | |
| DocType | > | code | 1..1 | SHALL | CD | SHALL CWE noNull | ValueSet LOINC Imaging Document Codes 1.3.6.1.4.1.12009.10.2.5 | |
| | > | | 1..1 | SHALL | | | | 8.1 General Header 1.2.840.10008.9.20 |
| | > | | 1..1 | SHALL | | | | 8.2 Imaging Header 1.2.840.10008.9.21 |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------------------|------------|-------------------|------|----------------|-----------|------------|-------|---|
| | > | | 0..1 | MAY | | | | 8.3 Parent Document 1.2.840.10008.9.22 |
| | > | component | 1..1 | SHALL | | | | |
| | >> | structuredBody | 1..1 | SHALL | | | | |
| | >>> | component | 0..1 | MAY | | | | |
| <i>Clinical Information</i> | >>>> | <i>section</i> | | | | | | 9.2 Clinical Information 1.2.840.10008.9.2 |
| | >>> | component | 1..1 | SHALL | | | | |
| <i>Procedure Description</i> | >>>> | <i>section</i> | | | | | | 9.3 Imaging Procedure Description 1.2.840.10008.9.3 |
| | >>> | component | 0..1 | MAY | | | | |
| <i>Comparison Study</i> | >>>> | <i>section</i> | | | | | | 9.4 Comparison Study 1.2.840.10008.9.4 |
| | >>> | component | 0..1 | MAY | | | | |
| <i>Findings</i> | >>>> | <i>section</i> | | | | | | 9.5 Findings 2.16.840.1.113883. 10.20.6.1.2 |
| | >>> | component | 1..1 | SHALL | | | | |
| <i>Impression</i> | >>>> | <i>section</i> | | | | | | 9.6 Impression 1.2.840.10008.9.5 |
| | >>> | component | 0..* | COND | | | | |
| <i>Addendum[*]</i> | >>>> | <i>section</i> | | | | | | 9.7 Addendum 1.2.840.10008.9.6 |

7.1.1 clinicalDocument/code

Most of the codes in Value Set LOINC Imaging Document Codes are pre-coordinated with the imaging modality, body part examined, and/or specific imaging method. When pre-coordinated codes are used, any coded values elsewhere in the document describing the modality, body part, etc., must be consistent with the document type code. Local codes used for report types may be included as a translation element in the code.

Note

Use of Value Set LOINC Imaging Document Codes is harmonized with HL7 Consolidated CDA Templates for Clinical Notes, Release 2. DICOM CID 7001 "Diagnostic Imaging Report Headings", used in TID 2000 "Basic Diagnostic Imaging Report", is a subset of the LOINC Imaging Document Codes.

Example 7.1.1-1. clinicalDocument/code example with translation element for local code

```
<code code="18748-4"
  displayName="Diagnostic Imaging Report"
  codeSystem="2.16.840.1.113883.6.1"
  codeSystemName="LOINC" >
  <translation code="XRPEDS"
    displayName="Pediatric Radiography Report"
    codeSystem="2.16.840.1.123456.78.9" />
</code>
```

7.1.2 Addendum

COND: If the header includes a relatedDocument element with typeCode RPLC, and the replaced document had a legalAuthenticator element (i.e., was signed), the component/structuredBody SHALL contain at least one 9.7 Addendum.

7.2 Imaging Addendum Report

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.24 |
| Name | Imaging Addendum Report |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Document structure for an Imaging Addendum Report, i.e., an appendage to an existing report document that contains supplemental information. The parent document content remains unaltered. The Addendum Report must be read together with its parent document for full context. Some institutions may have policies that forbid the use of Addendum Reports, and require revised reports with a complete restatement of the original documentation. |
| Classification | CDA Document Level |
| Relationships | |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--------------------|------------|-------------------|------|----------------|-----------|------------------------|---|--|
| Imaging Addendum | | Clinical Document | | | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.1 | |
| DocType | > | code | 1..1 | SHALL | CD | SHALL CWE noNull | ValueSet LOINC Imaging Document Codes 1.3.6.1.4.1.12009.10.2.5 | |
| | > | | 1..1 | SHALL | | | | 8.1 General Header 1.2.840.10008.9.20 |
| | > | | 1..1 | SHALL | | | | 8.2 Imaging Header 1.2.840.10008.9.21 |
| | > | relatedDocument | 1..1 | SHALL | | | | |
| | >@ | @typecode | 1..1 | SHALL | CS | SHALL | APND | |
| | >> | parentDocument | 1..1 | SHALL | | | | |
| Amended DocumentID | >>> | id | 1..1 | SHALL | II | | | |
| | > | component | 1..1 | SHALL | | | | |
| | >> | structuredBody | 1..1 | SHALL | | | | |
| | >>> | component | 1..* | SHALL | | | | |
| Addendum[*] | >>>> | section | | | | | | 9.7 Addendum 1.2.840.10008.9.6 |

8 Header Content Templates

8.1 General Header

| | |
|------------------|---|
| Template ID | 1.2.840.10008.9.20 |
| Name | General Header Elements |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | CDA Header Elements for all documents, including primary participations |
| Classification | CDA Header Elements |
| Relationships | Included in all document level templates |
| Context | sibling node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------|------------|---------------------|------|----------------|-----------|--------------|--|---------------------|
| | | templateId | 1..1 | SHALL | II | | | |
| | @ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.20 | |
| Content Template | | templateId | 0..* | MAY | II | | | |
| | | typeId | 1..1 | SHALL | II | | | |
| | @ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.1.3 | |
| | @ | @extension | 1..1 | SHALL | ST | SHALL | POCD_HD000040 | |
| | | id | 1..1 | SHALL | II | | | |
| Title | | title | 1..1 | SHALL | ST | | | |
| CreationTime | | effectiveTime | 1..1 | SHALL | TS | | | |
| Confidentiality | | confidentialityCode | 1..1 | SHALL | CE | SHALL CWE | ValueSet x_BasicConfidentialityKind Value Set 2.16.840.1.113883.11.16926 | |
| Language Code | | languageCode | 1..1 | SHALL | CS | SHALL CNE | ValueSet CID 5000 "Languages" | |
| SetId | | setId | 0..1 | MAY | II | | | |
| Version Number | | versionNumber | 1..1 | COND | INT | | | |
| Patient[*] | | recordTarget | 1..* | SHALL | | | | |
| | > | patientRole | 1..1 | SHALL | | | | |
| | >> | id | 1..* | SHALL | II | | | |
| IDIssuer | >>@ | root | 1..1 | SHALL | UID | | Issuer of Patient ID Qualifiers Sequence (0010,0024) > Universal Entity ID (0040,0032) Patient ID List PID-3.4.2 | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------------|------------|------------------------------|------|----------------|-----------|--------------|--|---------------------|
| ID | >>@ | extension | 1..1 | SHALL | ST | | <i>Patient ID (0010,0020)</i> <i>Patient ID List PID-3.1</i> | |
| Addr | >> | addr | 1..* | SHALL | AD | | | |
| Tele | >> | telecom | 1..* | SHALL | TEL | | | |
| | >> | patient | 1..1 | SHALL | | | | |
| Name | >>> | name | 1..1 | SHALL | PN | | <i>Patient's Name (0010,0010)</i> <i>Patient Name PID-5</i> | |
| Gender | >>> | administrative GenderCode | 1..1 | SHALL | CE | SHALL CNE | ValueSet AdministrativeGender Value Set 2.16.840.1.113883.11.1 <i>Patient's Sex (0010,0040);</i> [Map value "O" to nullFlavor UNK] <i>Administrative Sex PID-3.8</i> | |
| BirthTime | >>> | birthTime | 1..1 | SHALL | TS | | <i>Patient's Birth Date</i> <i>(0010,0030) + Patient's Birth</i> <i>Time (0010,0032)</i> <i>Date/Time of Birth PID-7</i> | |
| | >> | provider Organization | 0..1 | MAY | | | | |
| ProviderOrg Name | >>> | name | 1..* | SHALL | ON | | <i>Issuer of Patient ID</i> <i>(0010,0021)</i> | |
| ProviderOrg Tel | >>> | telecom | 0..* | SHOULD | TEL | | | |
| ProviderOrg Addr | >>> | addr | 0..* | SHOULD | AD | | | |
| | | legalAuthenticator | 0..1 | MAY | | | | |
| SigningTime | > | time | 1..1 | SHALL | TS | | | |
| | > | signatureCode | 1..1 | SHALL | CS | SHALL | S | |
| | > | assignedEntity | 1..1 | SHALL | | | | |
| SignerID | >> | id | 1..* | SHALL | II | | | |
| SignerAddr | >> | addr | 1..* | SHALL | AD | | | |
| SignerTel | >> | telecom | 1..* | SHALL | TEL | | | |
| | >> | assignedPerson | 1..1 | SHALL | | | | |
| SignerName | >>> | name | 1..1 | SHALL | PN | | | |
| Signature Block | > | sdtc:signatureText | 0..1 | MAY | ED | | | |
| Author[*] | | author | 1..* | SHALL | | | | |
| AuthoringTime | > | time | 1..1 | SHALL | TS | | | |
| | > | assignedAuthor | 1..1 | SHALL | | | | |
| | >> | id | 1..* | SHALL | II | | | |
| Addr | >> | addr | 1..* | SHALL | AD | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------|------------|------------------------------------|------|----------------|-----------|------------|----------|---------------------|
| Tel | >> | telecom | 1..* | SHALL | TEL | | | |
| | >> | assignedPerson | 1..1 | SHALL | | | | |
| Name | >>> | name | 1..1 | SHALL | PN | | | |
| Recipient[*] | | information Recipient | 0..* | MAY | | | | |
| | > | intendedRecipient | 1..1 | SHALL | | | | |
| | >@ | @classCode | 1..1 | SHALL | CS | SHALL | ASSIGNED | |
| Addr | >> | addr | 0..* | MAY | AD | | | |
| Tel | >> | telecom | 0..* | MAY | TEL | | | |
| | >> | information Recipient | 0..1 | MAY | | | | |
| Name | >>> | name | 1..1 | SHALL | PN | | | |
| | >> | received Organization | 0..1 | MAY | | | | |
| Org | >>> | name | 1..1 | SHALL | ON | | | |
| | | custodian | 1..1 | SHALL | | | | |
| | > | assignedCustodian | 1..1 | SHALL | | | | |
| | >> | represented Custodian Organization | 1..1 | SHALL | | | | |
| CustodianOrg ID | >>> | id | 1..* | SHALL | II | | | |
| CustodianOrg Name | >>> | name | 1..1 | SHALL | ON | | | |
| CustodianOrg Addr | >>> | addr | 1..1 | SHALL | AD | | | |
| CustodianOrg Tel | >>> | telecom | 1..1 | SHALL | TEL | | | |

Note that there is no business name associated with this template. Rather, this template is an editorial convenience for template specification, and the Business Names for the elements of this template are logically part of the business name scope of the invoking template.

8.1.1 templated - contentTemplate

This templated may be used to identify the template(s) used to generate/constrain the content of the report. This element is in addition to the templated of the document level template, and typically represents clinical sub-specialty requirements. See Section 5.1.1 on the structure and use of the templated.

Note

The IHE MRRT profile defines a "dterms.identifier" that may be used for this templated.

8.1.2 title

The title may include the title of the report template used.

Note

The IHE MRRT profile defines a "dterms.title" that may be used in this element.

8.1.3 effectiveTime

The effectiveTime signifies the document creation time, when the document first came into being. Where the CDA document is a transform from an original document in some other format, the ClinicalDocument.effectiveTime is the time the original document is created. The time when the transform occurred is not represented in CDA.

8.1.4 setID and versionNumber

The setID and versionNumber elements may be used by the document creation system to manage document revisions, in accordance with the CDA specification sections 4.2.1.7 and 4.2.1.8.

COND: If and only if the setID element is present, the versionNumber element SHALL be present.

8.1.5 recordTarget/patientRole

The recordTarget records the patient whose health information is described by the clinical document; it must contain at least one patientRole element.

Multiple recordTarget elements should be used only in the case of conjoined twins/triplets who are the subject of a single imaging procedure, or for special cases (e.g., pre-natal surgery, where a medical record has been established for the fetus).

Example 8.1.5-1. Header example

```
<typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
<!-- DICOM Imaging Report Template -->
<templateId root="1.2.840.10008.9.1"/>
<!-- General Header Template -->
<templateId root="1.2.840.10008.9.20"/>
<id extension="999021" root="2.16.840.1.113883.19"/>
<code codeSystem="2.16.840.1.113883.6.1"
  codeSystemName="LOINC" code="18748-4"
  displayName="Diagnostic Imaging Report"/>
<title>Radiology Report</title>
<effectiveTime value="20150329171504+0500"/>
<confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25"/>
<languageCode code="en-US" codeSystem="2.16.840.1.113883.6.121"/>
<setID extension="111199021" root="2.16.840.1.113883.19"/>
<versionNumber value="1"/>
```

8.1.6 legalAuthenticator

The legalAuthenticator identifies the single person legally responsible for the correctness of the content of the document and SHALL be present if the document has been legally authenticated. In the context of an imaging report, this means the radiologist, cardiologist, or other professional who signed or validated the report.

Note

Per the CDA Standard, the legal authenticator, if present, must be a person, and the authentication applies to the human-readable narrative in section/text and any renderMultiMedia referenced content. Structured entries and external images referenced through linkHtml are not attested by the legal authentication.

Based on local practice, clinical documents may be released before legal authentication. This implies that a clinical document that does not contain this element has not been legally authenticated.

The legalAuthenticator SHALL contain exactly one [1..1] time representing the time of signature.

The legalAuthenticator MAY contain zero or one [0..1] sdct:signatureText extension element. This provides a textual or multimedia depiction of the signature by which the participant endorses and accepts responsibility for his or her participation in the Act. The element is described in the HL7 CDA Digital Signature Standard.

Example 8.1.6-1. legalAuthenticator example

```
<legalAuthenticator>
  <time value="20050329224411+0500"/>
  <signatureCode code="S"/>
  <assignedEntity>
    <id extension="KP00017" root="2.16.840.1.113883.19"/>
    <addr>
      <streetAddressLine>21 North Ave.</streetAddressLine>
      <city>Burlington</city>
      <state>MA</state>
      <postalCode>02368</postalCode>
      <country>US</country>
    </addr>
    <telecom use="WP" value="tel:(555) 555-1003"/>
    <assignedPerson>
      <name>
        <given>Henry</given>
        <family>Seven</family>
      </name>
    </assignedPerson>
  </assignedEntity>
</legalAuthenticator>
```

8.1.7 recordTarget/patientRole/Patient/birthTime

Patient birthTime SHALL be precise to year, SHOULD be precise to day.

Example 8.1.7-1. recordTarget example

```
<recordTarget>
  <patientRole>
    <id extension="12345" root="2.16.840.1.113883.19"/>
    <!--Example ID using fake assigning authority OID. -->
    <id extension="111-00-1234" root="2.16.840.1.118975.4.1"/>
    <!--Fake Social Security Number using the actual SSN OID. -->
    <addr use="HP">
      <!--HP is "primary home" from codeSystem 2.16.840.1.113883.5.1119 -->
      <streetAddressLine>17 Daws Rd.</streetAddressLine>
      <city>Blue Bell</city>
      <state>MA</state>
      <postalCode>02368</postalCode>
      <country>US</country>
      <!--US is "United States" from ISO 3166-1 Country Codes: 1.0.3166.1 -->
    </addr>
    <telecom value="tel:(781) 555-1212" use="HP"/>
    <!--HP is "primary home" from AddressUse 2.16.840.1.113883.5.1119 -->
  </patientRole>
  <patient>
    <name use="L">
      <!--L is "Legal" from EntityNameUse 2.16.840.1.113883.5.45 -->
```

```

    <prefix>Mr.</prefix>
    <given>Adam</given>
    <given qualifier="CL">Frankie</given>
    <!--CL is "Call me" from EntityNamePartQualifier 2.16.840.1.113883.5.43 -->
    <family>Everyman</family>
  </name>
  <administrativeGenderCode code="M"
    codeSystem="2.16.840.1.113883.5.1" displayName="Male"/>
  <birthTime value="19541125"/>
</patient>
<providerOrganization>
  <id root="2.16.840.1.113883.19"/>
  <name>Good Health Clinic</name>
  <telecom use="WP" value="tel:(781) 555-1212"/>
  <addr>
    <streetAddressLine>21 North Ave</streetAddressLine>
    <city>Burlington</city>
    <state>MA</state>
    <postalCode>02368</postalCode>
    <country>US</country>
  </addr>
</providerOrganization>
</patientRole>
</recordTarget>

```

8.1.8 author/assignedAuthor

The author element represents the creator of the clinical document. This template restricts the author to be a person.

Such author SHALL contain exactly one [1..1] time representing the start time of the author's participation in the creation of the content of the clinical document.

Example 8.1.8-1. Person author example

```

<author>
  <time value="20050329224411+0500"/>
  <assignedAuthor>
    <id extension="KP00017" root="2.16.840.1.113883.19.5"/>
    <addr>
      <streetAddressLine>21 North Ave.</streetAddressLine>
      <city>Burlington</city>
      <state>MA</state>
      <postalCode>02368</postalCode>
      <country>US</country>
    </addr>
    <telecom use="WP" value="tel:(555) 555-1003"/>
    <assignedPerson>
      <name>
        <given>Henry</given>
        <family>Seven</family>
      </name>
    </assignedPerson>
  </assignedAuthor>
</author>

```

8.1.9 InformationRecipient/intendedRecipient

The informationRecipient participation elements record the intended recipients of the information at the time the document is created. An intended recipient may be a person (an informationRecipient entity), with or without an organization affiliation (receivedOrganization scoping entity), or simply an organization. If an organization, the document is expected to be incorporated into an information system of that organization (e.g., the electronic medical record for the patient).

Example 8.1.9-1. informationRecipient example

```
<informationRecipient>
  <intendedRecipient classCode="ASSIGNED">
    <informationRecipient>
      <name>
        <given>Henry</given>
        <family>Seven</family>
      </name>
    </informationRecipient>
    <receivedOrganization>
      <name>Good Health Clinic</name>
    </receivedOrganization>
  </intendedRecipient>
</informationRecipient>
```

8.2 Imaging Header

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.21 |
| Name | Imaging Header Elements |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | CDA Header Elements for imaging reports, including encounter, order, and study context |
| Classification | CDA Header Elements |
| Relationships | Included in 7.1 Imaging Report |
| Context | sibling node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-----------------------|------|----------------|-----------|------------|--------------------|---------------------|
| | | templateId | 1..1 | SHALL | II | | | |
| | @ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.21 | |
| | | componentOf | 1..1 | SHALL | | | | |
| | > | encompassingEncounter | 1..1 | SHALL | | | | |
| | >> | id | 0..1 | SHOULD | II | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------------------------------|------------|------------------------------|------|----------------|-----------|------------|--|---------------------|
| Encounter IDIssuer | >>@ | @root | 1..1 | SHALL | UID | | <i>Issuer of Admission ID Sequence (0038;0014) > Universal Entity ID (0040,0032)</i> <i>Visit Number PV1-19.4.2</i> | |
| EncounterID | >>@ | @extension | 1..1 | SHALL | ST | | <i>Admission Id (0038,0010)</i> <i>Visit Number PV1-19.1</i> | |
| EncounterTime | >> | effectiveTime | 1..1 | SHALL | | | | |
| | >> | location | 0..1 | MAY | | | | |
| | >>> | healthCareFacility | 1..1 | SHALL | | | | |
| | >>>> | location | 0..1 | SHOULD | | | | |
| Healthcare FacilityName | >>>> | name | 1..1 | SHALL | EN | | | |
| Healthcare FacilityAddress | >>>> | addr | 1..1 | SHALL | AD | | | |
| | >>>> | serviceProvider Organization | 0..1 | SHOULD | | | | |
| Healthcare Provider Organization Name | >>>> | name | 1..1 | SHALL | ON | | | |
| | >> | encounterParticipant | 0..* | MAY | | | | |
| | >>@ | @typeCode | 1..1 | SHALL | | | ATND | |
| | >>> | assignedEntity | 1..1 | SHALL | | | | |
| | >>>> | assignedPerson | 1..1 | SHALL | | | | |
| Attending PhysicianName | >>>> | name | 1..1 | SHALL | EN | | | |
| | | inFulfillmentOf | 1..* | SHALL | | | | |
| Order[*] | > | order | 1..1 | SHALL | | | | |
| | >> | id | 1..1 | SHALL | II | | | |
| OrderAssigning Authority | >>@ | @root | 1..1 | SHALL | UID | | <i>Order Placer Identifier Sequence (0040,0026) > Universal Entity ID (0040,0032)</i> <i>Placer Order Number OBR-2.3</i> | |
| OrderPlacer Number | >>@ | @extension | 1..1 | SHALL | ST | | <i>Placer Order Number/Imaging Service Request (0040,2016)</i> <i>Placer Order Number OBR-2.1</i> | |
| | >> | ps3-20:accessionNumber | 1..1 | SHALL | II | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------------|------------|-------------------|------|----------------|-------------|------------|---|---------------------|
| Accession Assigning Authority | >>@ | @root | 1..1 | SHALL | UID | | <i>Issuer of Accession Number Sequence (0008,0051) > Universal Entity ID (0040,0032)</i> <i>Filler Order Number OBR-2.3</i> | |
| Accession Number | >>@ | @extension | 1..1 | SHALL | ST | | <i>Accession Number (0008,0050)</i> <i>Filler Order Number OBR-2.1</i> | |
| Ordered ProcedureCode | >> | code | 0..1 | SHOULD | CE | | <i>Requested Procedure Code Sequence (0032,1064)</i> <i>Universal Service ID OBR-4</i> | |
| OrderPriority | >> | priorityCode | 0..1 | SHOULD | CE | | ValueSet ActPriority Value Set 2.16.840.1.113883.11.16866 | |
| | | documentationOf | 1..* | SHALL | | | | |
| Study[*] | > | serviceEvent | 1..1 | SHALL | | | | |
| StudyUID | >> | id | 1..1 | SHALL | II | | <i>Study Instance UID (0020,000D)</i> <i>Study Instance UID IPC-3</i> | |
| ProcedureCode | >> | code | 1..1 | SHALL | CE | | <i>Procedure Code Sequence (0008,1032)</i> | |
| Modality | >>> | translation | 1..* | SHALL | CD | SHALL CNE | <i>Modality (0008,0060)</i> | |
| Anatomic RegionCode | >>> | translation | 0..1 | SHOULD | CD | | ConceptDomain AnatomicRegion | |
| | >> | effectiveTime | 1..1 | SHALL | IVL <TS> | | | |
| StudyTime | >>> | low | 1..1 | SHALL | TS | | <i>Study Date (0008,0020) + Study Time (0008,0030) + Timezone Offset From UTC (0008,0201)</i> <i>Observation Date/Time OBR-7</i> | |
| Performer[*] | >> | performer | 0..* | MAY | | | | |
| Type | >>@ | @typeCode | 1..1 | SHALL | CS | SHALL | ValueSet x_serviceEventPerformer Value Set 2.16.840.1.113883.11.19601 | |
| | >>> | assignedEntity | 1..1 | SHALL | | | | |
| ID | >>>> | id | 1..1 | SHALL | II | | | |
| | >>>> | assignedPerson | 1..1 | SHALL | | | | |
| Name | >>>>> | name | 1..1 | SHALL | PN | | | |
| | | participant | 1..1 | SHALL | | | | |
| | @ | @typeCode | 1..1 | SHALL | CS | SHALL | REF | |
| | > | associatedEntity | 1..1 | SHALL | | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-----------------------|------------|-------------------|------|----------------|-----------|------------|--|---------------------|
| | >@ | @classCode | 1..1 | SHALL | CS | SHALL | PROV | |
| ReferrerID | >> | id | 0..1 | SHOULD | II | | <i>Ordering Provider ORC-12.1 + ORC-12.9.2</i> | |
| ReferrerAddr | >> | addr | 0.* | SHOULD | AD | | <i>Ordering Provider Address ORC-24</i> | |
| ReferrerTel | >> | telecom | 0..* | SHOULD | TEL | | <i>Call Back Phone Number ORC-14</i> | |
| | >> | associatedPerson | 1..1 | SHALL | | | | |
| ReferrerName | >>> | name | 1..1 | SHALL | PN | | <i>Referring Physician's Name (0008,0090)</i> <i>Ordering Provider ORC-12</i> | |
| | | dataEnterer | 0..1 | MAY | | | | |
| | @ | @typeCode | 1..1 | SHALL | CS | SHALL | ENT | |
| | > | assignedEntity | 1..1 | SHALL | | | | |
| Transcriptionist ID | >> | id | 0..1 | SHOULD | II | | <i>Transcriptionist OBR-35.1.1</i> | |
| | >> | assignedPerson | 0..1 | SHOULD | | | | |
| Transcriptionist Name | >>> | name | 1..1 | SHALL | PN | | <i>Transcriptionist OBR-35.1</i> | |

Note that there is no business name associated with this template. Rather, this template is an editorial convenience for template specification, and the Business Names for the elements of this template are logically part of the Business Name scope of the invoking template.

8.2.1 componentOf/encompassingEncounter

The id element of the encompassingEncounter represents the identifier for the encounter. When the diagnostic imaging procedure is performed in the context of a hospital stay or an outpatient visit for which there is an Encounter Number, Visit Number, or Admission ID, equivalent to DICOM attribute (0038,0010), that number should be present as the ID of the encompassingEncounter.

The effectiveTime of the encompassingEncounter represents the time interval or point in time in which the encounter took place. The encompassing encounter might be that of the hospital or office visit in which the imaging procedure was performed. If the effective time is unknown, a nullFlavor attribute can be used.

Example 8.2.1-1. componentOf example

```

<componentOf>
  <encompassingEncounter>
    <id extension="9937012" root="1.3.6.4.1.4.1.2835.12"/>
    <effectiveTime value="20060828170821"/>
    <encounterParticipant typeCode="ATND">
      <assignedEntity>
        <id extension="4" root="2.16.840.1.113883.19"/>
        <code code="208M00000X"
          codeSystem="2.16.840.1.113883.6.101"
          codeSystemName="NUCC"
          displayName="Hospitalist"/>
        <addr nullFlavor="NI"/>
        <telecom nullFlavor="NI"/>
        <assignedPerson>

```

```

        <name>
          <prefix>Dr.</prefix>
          <given>Fay </given>
          <family>Family</family>
        </name>
      </assignedPerson>
    </assignedEntity>
  </encounterParticipant>
</encompassingEncounter>
</componentOf>

```

8.2.2 Physician of Record Participant

This encounterParticipant with typeCode="ATND" (Attender) is the attending physician and is usually different from the Physician Reading Study Performer defined in documentationOf/serviceEvent.

Example 8.2.2-1. Physician of record participant example

```

<encounterParticipant typeCode="ATND">
  <assignedEntity>
    <id extension="44444444" root="2.16.840.1.113883.4.6"/>
    <code code="208M00000X"
      codeSystem="2.16.840.1.113883.6.101"
      codeSystemName="NUCC"
      displayName="Hospitalist"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <assignedPerson>
      <name>
        <prefix>Dr.</prefix>
        <given>Fay</given>
        <family>Family</family>
      </name>
    </assignedPerson>
  </assignedEntity>
</encounterParticipant>

```

8.2.3 inFulfillmentOf/Order and @ID

An inFulfillmentOf element represents the Placer Order. There may be more than one inFulfillmentOf element in the case where a single report is fulfilling multiple orders. There SHALL be one inFulfillmentOf/order for each distinct Order associated with the report.

In each inFulfillmentOf/order there SHALL be one order/id for the Placer Order Number (0040,2016). There SHALL be one order/ps3-20:accessionNumber for the DICOM Accession Number (0008,0050) associated with the order. The ps3-20:accessionNumber SHALL be Data Type II; it SHALL have a UID root attribute identifying its assigning authority, and the DICOM Accession Number SHALL be in the extension attribute.

Example 8.2.3-1. inFulfillmentOf example

```

<xs:schema ...
  xmlns:ps3-20="urn:dicom-org:ps3-20"
  ...

```

```

</xs:schema>
<inFulfillmentOf>
  <order>
    <id extension="089-927851" root="2.16.840.1.113883.19.4.33"/>
    <!-- {extension} =
      Placer Order Number/Imaging Service Request (0040,2016) {root} =
      Order Placer Identifier Sequence (0040,0026) > Universal Entity ID (0040,0032) -->
    <ps3-20:accessionNumber extension="10523475" root="2.16.840.1.113883.19.4.27" />
    <!-- {extension}=
      Accession Number (0008,0050) {root} =
      Issuer of Accession Number Sequence (0008,0051) > Universal Entity ID (0040,0032) -->
    <code code="RPID24"
      displayName="CT HEAD WITH IV CONTRAST"
      codeSystem="2.16.840.1.113883.6.256"
      codeSystemName="RadLex Playbook">
    <!-- Ordered Procedure Code is
      Requested Procedure Code Sequence (0032,1064) -->
  </order>
</inFulfillmentOf>

```

8.2.4 documentationOf/serviceEvent

Each documentationOf/serviceEvent indicates an imaging procedure that the provider describes and interprets in the content of the report. The main activity being described by this document is both the performance of the imaging procedure and the interpretation of the imaging procedure.

There may be more than one documentationOf/serviceEvent element if the report is interpreting multiple DICOM Studies. There may also be multiple reports for a single DICOM Study.

The serviceEvent/id element contains the DICOM Study Instance UID.

The date and time of the imaging procedure is indicated in the serviceEvent/effectiveTime element; the date and time of the interpretation is in the clinicalDocument/effectiveTime.

Note

The serviceEvent/effectiveTime uses the IVL_TS data type with the low element required, for harmonization with Consolidated CDA release 1.1.

8.2.4.1 code and translation

Within each documentationOf element, there is one serviceEvent element. The type of imaging procedure may be further described in the serviceEvent/code element. This guide makes no specific recommendations about the primary vocabulary to use for describing this event, identified as Procedure Code.

The serviceEvent/code/translation elements include codes representing the primary image acquisition modality using DICOM (DCM) terminology, and target anatomic region (for which SNOMED terminology is recommended).

Note

1. These codes may be used as health information exchange search metadata in accordance with the IHE Radiology Technical Framework Cross-Enterprise Document Sharing for Imaging (XDS-I) Profile.
2. Binding of the Concept Domains ProcedureCode and AnatomicRegion to specific Value Sets may be done in a further profiling of the use of this Template.

Example 8.2.4.1-1. documentationOf example

```

<documentationOf>
  <serviceEvent classCode="ACT" moodCode="EVN">
    <!-- study instance UID (0020,000D) -->
    <id root="1.2.840.113619.2.62.994044785528.114289542805"/>
    <!-- code is DICOM (Performed) Procedure Code Seq (0008,1032) -->
    <code code="71020"
      displayName="Radiologic examination, chest, two views, frontal and lateral"
      codeSystem="2.16.840.1.113883.6.12"
      codeSystemName="CPT4">
      <translation code="XR"
        displayName="XR"
        codeSystem="1.2.840.10008.2.16.4"
        codeSystemName="DCM"/>
      </code>
    <!-- translation code is Modality (0008,0060) -->
    <effectiveTime value="20060823222400+0800"/>
  </serviceEvent>
</documentationOf>

```

8.2.4.2 Performer

The documentationOf/serviceEvent may include as a participant the physician reading the study, equivalent to DICOM attribute (0008,1060), and other healthcare professional participants in the procedure (e.g., the surgical performer in an interventional procedure).

Note

In simple procedures, the physician reading the study is identified in the Author or LegalAuthenticator participation on the ClinicalDocument, and does not need to be re-identified in this element. The technologist performing the imaging may be identified in this element as a secondary performer, since the interpreting physician is the principal performer responsible for the service event.

Example 8.2.4.2-1. Physician reading study performer example

```

<performer typeCode="PRF">
  <assignedEntity>
    <id extension="111111111" root="2.16.840.1.113883.4.6"/>
    <code code="2085R0202X"
      codeSystem="2.16.840.1.113883.6.101"
      codeSystemName="NUCC"
      displayName="Diagnostic Radiology"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <assignedPerson>
      <name><given>Christine</given><family>Cure</family><suffix>MD</suffix></name>
    </assignedPerson>
  </assignedEntity>
</performer>

```

Example 8.2.4.2-2. participant example

```

<participant typeCode="REF">
  <associatedEntity classCode="PROV">
    <id nullFlavor="NI"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <associatedPerson>
      <name><given>Amanda</given><family>Assigned</family><suffix>MD</suffix></name>
    </associatedPerson>
  </associatedEntity>
</participant>

```

Example 8.2.4.2-3. dataEnterer example

```

<dataEnterer>
  <assignedEntity typeCode="ENT">
    <id root="2.16.840.1.113883.19.5" extension="43252"/>
    <addr>
      <streetAddressLine>21 North Ave.</streetAddressLine>
      <city>Burlington</city>
      <state>MA</state>
      <postalCode>02368</postalCode>
      <country>US</country>
    </addr>
    <telecom use="WP" value="tel:(555) 555-1003"/>
    <assignedPerson>
      <name><given>Henry</given><family>Seven</family></name>
    </assignedPerson>
  </assignedEntity>
</dataEnterer>

```

8.3 Parent Document

| | |
|-------------------------|---|
| Template ID | 1.2.840.10008.9.22 |
| Name | Parent Document Header Elements |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | CDA Header Elements describing relationship to prior/parent documents |
| Classification | CDA Header Elements |
| Relationships | Included in all document level templates |
| Context | sibling node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--------------------------|------------|-------------------|------|----------------|-----------|------------|-------|---------------------|
| | | relatedDocument | 0..1 | MAY | | | | |
| | @ | @typecode | 1.1 | SHALL | CS | SHALL | RPLC | |
| | > | parentDocument | 1..1 | SHALL | | | | |
| ReplacedDocument ID | >> | id | 1..1 | SHALL | II | | | |
| ReplacedDocument SetID | >> | setId | 0..1 | MAY | II | | | |
| ReplacedDocument Version | >> | versionNumber | 1..1 | COND | INT | | | |
| | | relatedDocument | 0..1 | MAY | | | | |
| | @ | @typecode | 1.1 | SHALL | CS | SHALL | XFRM | |
| | > | parentDocument | 1..1 | SHALL | | | | |
| Transformed DocumentID | >> | id | 1..1 | SHALL | II | | | |

8.3.1 relatedDocument

A document may have two types of parent document:

- A superseded version that the present document wholly replaces (typeCode = RPLC). Documents may go through stages of revision prior to being legally authenticated. Such early stages may be drafts from transcription, those created by residents, or other preliminary versions. Policies not covered by this specification may govern requirements for retention of such earlier versions. Except for forensic purposes, the latest version in a chain of revisions represents the complete and current report.
- A source document from which the present document is transformed (typeCode = XFRM). A document may be created by transformation from a DICOM Structured Report (SR) document (see Annex C).

The CDA document management vocabulary includes a typeCode APND (append) relationship to a parent document. This relationship type is not supported in this specification; rather, append is effected by creating a replacement document with an 9.7 Addendum.

8.3.2 parentDocument/setId and versionNumber

COND: If and only if the setId element is present, the versionNumber element SHALL be present.

Example 8.3.2-1. relatedDocument example

```
<!-- transformation of a DICOM SR -->
<relatedDocument typeCode="XFRM">
  <parentDocument>
    <id root="1.2.840.113619.2.62.994044785528.20060823.2006082322322.9"/>
    <!-- SOP Instance UID (0008,0018) of SR sample document -->
  </parentDocument>
</relatedDocument>
```


9 Section-level Templates

9.1 General Requirements For Sections

9.1.1 Section Text

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.19 |
| Name | Section Text |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | This template specifies the common set of narrative block markup that may be included in a CDA imaging report section. |
| Classification | CDA Element Set |
| Relationships | Included in all sections |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------------|------------|-------------------|------|----------------|----------------------|------------|--------------------|---------------------|
| Text | | text | 1..1 | COND | ED | | | |
| Content[*] | > | content | 0..* | MAY | ST | | | |
| * | >@ | @ID | 1..1 | SHALL | XML ID | | [See 5.3.4 XML ID] | |
| Style | >@ | @styleCode | 0..1 | MAY | XML NMTOKENS | | | |
| IntRef[*] | > | linkHtml | 0..* | MAY | ST | | | |
| | >@ | @href | 1..1 | SHALL | ST (URL - XML IDREF) | | | |
| GraphicRef[*] | > | renderMultiMedia | 0..* | MAY | | | | |
| | >@ | @referencedObject | 1..1 | SHALL | XML IDREF | | | |
| Caption | >> | caption | 0..1 | MAY | ST | | | |
| ExtRef[*] | > | linkHtml | 0..* | MAY | ST | | | |
| URL | >@ | @href | 1..1 | SHALL | ST (URL) | | | |
| Paragraph(*) | > | paragraph | 0..* | MAY | ST | | | |
| Caption | >> | caption | 0..1 | MAY | ST | | | |
| List(*) | > | list | 0..* | MAY | ST | | | |
| * | >@ | @ID | 1..1 | SHALL | XML ID | | [See 5.3.4 XML ID] | |
| Ordered | >@ | @listType | 0..1 | MAY | XML NMTOKENS | SHALL | ordered | |
| Caption | >> | caption | 0..1 | MAY | ST | | | |
| Item(*) | >> | item | 1..* | SHALL | ST | | | |

| | | | | | | | | |
|-----------------|-----|------------|------|-------|--------|-------|--------------------|--|
| * | >>@ | @ID | 1..1 | SHALL | XML ID | | [See 5.3.4 XML ID] | |
| Table(*) | > | table | 1..1 | SHALL | | | | |
| * | >@ | @ID | 1..1 | SHALL | XML ID | | [See 5.3.4 XML ID] | |
| Caption | >> | caption | 0..1 | MAY | ST | | | |
| | >> | Tr | 1..1 | SHALL | | | | |
| | >>@ | @styleCode | 1..1 | SHALL | CS | SHALL | Bold | |
| ColumnHead(*) | >>> | Th | 1..* | SHALL | ST | | | |
| Row[*] | >> | Tr | 1..* | SHALL | | | | |
| * | >>@ | @ID | 1..1 | SHALL | XML ID | | | |
| Cell(*) | >>> | Td | 1..1 | SHALL | ST | | | |

The text element within the section stores the narrative to be rendered, as described in the CDA R2 specification, and is referred to as the CDA narrative block.

COND: The text element SHALL be present if the section content is not completely represented by subsections.

As noted in the CDA R2 specification, the document originator is responsible for ensuring that the narrative block contains the complete, human readable, attested content of the section. Structured entries support computer processing and computation, and are not a replacement for the attestable, human-readable content of the CDA narrative block.

Additional specification information for the CDA narrative block can be found in the CDA R2 specification in sections 1.2.1, 1.2.3, 1.3, 1.3.1, 1.3.2, 4.3.4.2, and 6.

The narrative block allows a variety of markup. The markup that implements various types of internal and external linkage is shown in the table, and is included in the conformance specifications for each section narrative block that invokes this template. The markup elements may occur in any order and at any point within the narrative block text as allowed by the CDA R2 specification.

9.1.1.1 <content> Markup and Links From Entries

The CDA narrative block may contain the <content> markup element to wrap a block of text so that it can be explicitly identified using its XML ID attribute, and referenced from elsewhere in the document. Specifically, structured entries may link to their equivalent narrative rendering in a content block using the XML ID (see CDA R2 Specification, section 4.3.5.1).

Additionally, a content block may include a styleCode attribute to suggest rendering (see CDA R2 Specification, section 4.3.5.11). For example, Bold could also be used to highlight actionable findings in the text of the 9.5 Findings and/or 9.6 Impression sections.

9.1.1.2 <linkHtml> Markup and Internal References

The CDA narrative block MAY contain the <linkHtml> markup to provide a link between narrative text in one section and a content block in another section (see CDA R2 specification section 4.3.5.2). The XML ID of the target content block is used in the linkHtml href attribute, with a prefixed '#' to indicate the reference is in the current document.

For example, a linkHtml reference could be used to link an actionable finding in the 9.6 Impression section to the specific, detailed measurement evidencing a problem that was identified in the text of the 9.5 Findings section.

9.1.1.3 <renderMultiMedia> Markup and Graphical Content

The CDA narrative block MAY contain the <renderMultiMedia> markup element to include graphical content, e.g., a coronary tree diagram or myocardial wall motion "bulls-eye chart". The renderMultiMedia element SHALL link to an observationMedia structured entry using the XML ID of that entry (see CDA R2 Specification, section 4.3.5.6).

9.1.1.4 <linkHtml> Markup and External References

The CDA narrative block MAY contain the <linkHtml> markup to provide a link between narrative text and an external (non-attested) resource (see CDA R2 specification section 4.3.5.2).

Note

For radiology reports, this capability may be used to tag concepts in the narrative block to concepts defined in the RadLex terminology (<http://www.radlex.org>), developed by the Radiological Society of North America. The RadLex coded vocabulary is a useful tool for indexing report content for data mining purposes. It is not intended to be a complete grammar for expression of clinical statements, but rather a lexicon for tagging concepts of interest.

Within the report section narrative blocks, RadLex codes may be included using the <linkHtml> element and a URI pointing to the RadLex resource. <linkHtml> elements may be embedded in the text at the location of the concept (within the scope of a content tag), or may be provided in a list at the end of the narrative block.

Example 9.1.1.4-1. Example - linkHtml references at point of use for RadLex

```
<section>
...
<text>
...
  <content ID="find1">There is focal opacity
    <linkHtml href="http://www.radlex.org/RID/RID28530"/>
    at the right lung
    <linkHtml href="http://www.radlex.org/RID/RID1302"/>
    base most likely representing right lower lobe atelectasis
    <linkHtml href="http://www.radlex.org/RID/RID28493"/>.
  </content>
  <content ID="find2">The mediastinum ...</content>
</text>
...
</section>
```

Example 9.1.1.4-2. Example- linkHtml references at end of narrative block for RadLex

```
<section>
  <title>Findings</title>
  <text>
    <content ID="find1">Pleura normal... </content>
    <linkHtml href="http://www.radlex.org/RID/RID1362"/>
  </text>
</section>
```

9.1.1.5 <linkHtml> Markup and Image References

The text elements (and their children) MAY contain Web Access to DICOM Persistent Object (WADO) references to DICOM objects by including a linkHtml element where @href is a valid WADO URL. The text content of linkHtml MAY be either the visible text of the hyperlink, or a descriptor or identifier of the image.

The linkHtml may be associated with a <renderMultiMedia> markup element to specify a (limited resolution) copy of the image to be rendered in the narrative (e.g., a thumbnail); the renderMultiMedia element SHALL link to an observationMedia structured entry using the XML ID of that entry. As CDA does not allow use of an image as the linkHtml displayable hyper-linked content, the linkHtml should immediately follow the renderMultiMedia for the thumbnail.

Example 9.1.1.5-1. Example linkHtml reference for WADO image access

```

<text>
...
<paragraph>
  <caption>Source of Measurement</caption>
  <renderMultiMedia referencedObject="#thumb1"/>
  <linkHtml href="http://www.example.org/wado?requestType=WADO
    &studyUID=1.2.840.113619.2.62.994044785528.114289542805
    &seriesUID=1.2.840.113619.2.62.994044785528.20060823223142485051
    &objectUID=1.2.840.113619.2.62.994044785528.200608232232322.3
    &contentType=application/dicom">Chest_PA</linkHtml>
</paragraph>
...
</text>

```

9.1.1.6 list

This template specifies a structure and Business Names for list markup in the narrative text, as described in the CDA Specification section 4.3.5.8. Inclusion of the listType="ordered" attribute specifies a numbered list of items.

Each list is identified by an XML ID attribute, and each list item also is identified by an XML ID attribute.

The list items contain human readable displayable text using any of the narrative text structures permitted in section/text, including internal, external, or image references, or graphics. Processable structured data may be encoded in 10.1 Coded Observation or 10.5 Quantity Measurement entries in the *section*. Such observation entries SHOULD be linked to the corresponding item through the ID attribute of the item (see Section 10.1.2 and Section 10.5.1).

9.1.1.7 table

This template specifies a structure and Business Names for table markup in the narrative text, as described in the CDA Specification section 4.3.5.9, typically used for a table of measurements. The table may be of arbitrary size.

Note

See Travis, A., et al., "Preferences for Structured Reporting of Measurement Data", *JAcadRadiology* 21:6
DOI:10.1016/j.acra.2014.02.008

Each table is identified by an XML ID attribute, and each table row also is identified by an XML ID attribute.

The table cells contain human readable displayable text using any of the narrative text structures permitted in section/text, including internal, external, or image references, or graphics. Processable structured data may be encoded in 10.1 Coded Observation or 10.5 Quantity Measurement entries in the *section*. Such observation entries SHOULD be linked to the corresponding row through the ID attribute of the row (see Section 10.1.2 and Section 10.5.1).

Example 9.1.1.7-1. Measurements Table Example 1

As displayed

Table . Cardiac Measurements

| Measurement name | Value | Flag |
|-------------------------------------|--------|------|
| Left ventricular ejection fraction | 40 % | LOW |
| Left ventricle end diastolic volume | 120 ml | |

| Measurement name | Value | Flag |
|------------------------------------|-------|------|
| Left ventricle end systolic volume | 72 ml | |

As encoded in CDA instance

```

<text>
<table ID="T-C">
  <caption>Cardiac Measurements</caption>
  <tr styleCode="Bold">
    <th>Measurement name</th>
    <th>Value</th>
    <th>Flag</th>
  </tr>
  <tr ID="Q1">
    <td>Left ventricular ejection fraction</td>
    <td>40 %</td>
    <td styleCode="Bold">LOW</td>
  </tr>
  <tr ID="Q2">
    <td>Left ventricle end diastolic volume</td>
    <td>120 ml</td>
  </tr>
  <tr ID="Q3">
    <td>Left ventricle end systolic volume</td>
    <td>72 ml</td>
  </tr>
</table>
</text>
<entry>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.14"/>
    <id root="1.2.840.10213.2.62.7044234.11652014"/>
    <code code="10230-1" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="LVEF" />
    <text><reference value="#Q1"/></text>
    <statusCode code="completed"/>
    <effectiveTime value="20140913223912"/>
    <value xsi:type="PQ" unit="%" value="40" />
    <interpretationCode code="L" codeSystem="2.16.840.1.113883.6.83"
      codeSystemName="ObservationInterpretation" displayName="Low" />
  </observation>
</entry>
<entry>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.14"/>
    <id root="1.2.840.10213.2.62.7044234.11652014"/>
    <code code="8821-1" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="LVEDV" />
    <text><reference value="#Q2"/></text>
    <statusCode code="completed"/>
    <effectiveTime value="20140913223912"/>
    <value xsi:type="PQ" unit="ml" value="120" />
  </observation>
</entry>
<entry>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.14"/>
    <id root="1.2.840.10213.2.62.7044234.11652014"/>

```

```

<code code="8823-7" codeSystem="2.16.840.1.113883.6.1"
  codeSystemName="LOINC" displayName="LVESV" />
<text><reference value="#Q3"/></text>
<statusCode code="completed"/>
<effectiveTime value="20140913223912"/>
<value xsi:type="PQ" unit="ml" value="72" />
</observation>
</entry>

```

Example 9.1.1.7-2. Measurements Table Example 2

As displayed

Table . Current Lesion Sizes with Comparison to Exam on 2014/11/16

| Ref | Measurement name | Current Value | Prior Value | Image Reference |
|-----|--|---------------|-------------|-----------------|
| L1 | Left periaortic lymph node size (mm) | 12 x 8 | 15 x 10 | Ser:3, Img:67 |
| L2 | Segment 2 left lobe lesion size (mm) | 6 x 8 | 10 x 9 | Ser:3, Img:79 |
| L3 | Left common iliac lymph node size (mm) | 12 x 3 | 16 x 5 | Ser:3, Img:139 |

As encoded in CDA instance

```

<text>
<table ID="Table2">
<caption>Current Lesion Sizes with Comparison to Exam on 2014/11/16</caption>
<tr styleCode="Bold">
<td>Ref</td>
<td>Measurement name</td>
<td>Current Value</td>
<td>Prior Value</td>
<td>Image Reference</td>
</tr>
<tr ID="lesRow1">
<td>L1</td>
<td>Left periaortic lymph node size (mm) </td>
<td>12 x 8</td>
<td>15 x 10</td>
<td><linkHtml href="http://wado.pacs.guh.org/..." >Ser:3, Img:67</linkHtml></td>
</tr>
...
</table>
</text>

```

9.1.2 General Section Entries

| | |
|-----------------------|-------------------------|
| Template ID | 1.2.840.10008.9.23 |
| Name | General Section Entries |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |

| | |
|-------------------------|---|
| Description | This template specifies the common set of structured entries that may be included in a CDA imaging report section, and an author participation for the section. |
| Classification | CDA Element Set |
| Relationships | Included in 9.5 Findings section and its sub-sections, 9.2 Clinical Information and other sections |
| Context | sibling node |
| Open/Closed | open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--------------------------------|------------|--------------------------|------|----------------|-----------|------------|-------|---|
| ContentTemplate | | templateId | 0..1 | MAY | II | | | |
| | | author | 0..* | MAY | | | | |
| AuthoringTime | > | time | 1..1 | SHALL | TS | | | |
| | > | assignedAuthor | 1..1 | SHALL | | | | |
| AuthorID | >> | id | 1..* | SHALL | II | | | |
| | >> | assignedPerson | 1..1 | COND | | | | |
| AuthorName | >>> | name | 1..1 | SHALL | PN | | | |
| | >> | assignedAuthoring Device | 1..1 | COND | | | | |
| AuthorDevice Model | >>> | manufacturerModel Name | 0..1 | SHOULD | ST | | | |
| AuthorSoftware | >>> | softwareName | 0..1 | SHOULD | ST | | | |
| | >> | represented Organization | 0..1 | MAY | | | | |
| AuthorOrganization | >>> | name | 0..1 | SHOULD | ON | | | |
| | | entry | 0..* | MAY | | | | |
| <i>Coded Observation[*]</i> | > | <i>observation</i> | 1..1 | SHALL | | | | 10.1 Coded Observation 2.16.840.1.113883.10.20.6.2.13 |
| | | entry | 0..* | MAY | | | | |
| <i>Quantity Measurement[*]</i> | > | <i>observation</i> | 1..1 | SHALL | | | | 10.5 Quantity Measurement 2.16.840.1.113883.10.20.6.2.14 |
| | | entry | 0..* | MAY | | | | |
| <i>Graphic[*]</i> | > | <i>observationMedia</i> | 1..1 | SHALL | | | | 10.3 observationMedia 1.3.6.1.4.1.19376.1.4.1.4.7 |
| | | entry | 0..* | MAY | | | | |
| <i>SOPInstance[*]</i> | > | <i>observation</i> | 1..1 | SHALL | | | | 10.8 SOP Instance Observation 1.2.840.10008.9.18 |
| | | entry | 0..* | MAY | | | | |
| | > | regionOfInterest | 0..0 | SHALL NOT | | | | |

Note that there is no business name associated with this template. Rather, this template is an editorial convenience for template specification, and the Business Names for the elements of this template are logically part of the Business Name scope of the invoking template.

Also, the ID of this template is not represented in a templateID element. Rather, the templateID of the invoking template implicitly includes the elements specified by this template.

9.1.2.1 templateID

This templateID may be used to identify the template(s) used to generate/constrain the content of the section. This is in addition to the templateID of the section level template, and typically represents clinical sub-specialty requirements. See Section 5.1.1 on the structure and use of the templateID.

9.1.2.2 author

The author participation allows the recording of an author for a section, equivalent to the TID 1002 "Observer Context". Either a person or a device may be identified as the author for a section or subsection.

COND: Either the assignedPerson or assignedAuthoringDevice element SHALL be present.

Example 9.1.2.2-1. Author example

```
<author>
  <assignedAuthor>
    <id extension="121008" root="2.16.840.1.113883.19.5"/>
    <assignedPerson>
      <name>
        <given>John</given>
        <family>Blitz</family>
        <suffix>MD</suffix>
      </name>
    </assignedPerson>
  </assignedAuthor>
</author>
```

9.1.2.3 section/entry

A section may contain CDA entries that represent clinical statements in coded form (using the 10.1 Coded Observation template), numeric measurements (using the 10.5 Quantity Measurement template), images to be displayed in the narrative block (using the 10.3 observationMedia template, and invoked from a renderMultiMedia element), or references to external images or annotated images (using the 10.8 SOP Instance Observation template).

These entries may appear in any order.

9.1.2.4 regionOfInterest

Section templates defined in this Implementation guide SHALL NOT use the CDA Region of Interest Overlay entry (classCode="ROIOVL"). If it is desired to show images with graphical annotations, the annotations SHOULD be encoded in DICOM Presentation State objects that reference the image. Report applications that display referenced images and annotation may retrieve a rendered image using a WADO reference in accordance with PS3.18, including the image and Presentation State, or other DICOM retrieval and rendering methods. This approach avoids the risks of errors in registering a CDA region of interest annotation with DICOM images, and places all image rendering within the scope of the DICOM Standard, including the full range of 2D and 3D presentations defined in DICOM.

9.2 Clinical Information

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.2 |
| Name | Clinical Information |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Clinical details about the case such as presenting signs and symptoms, past clinical history, the overall condition of the patient, etc. |
| Classification | CDA Section Level |
| Relationships | Included in 7.1 Imaging Report |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------------------|------------|-------------------|------|----------------|-----------|------------|--|--|
| Clinical Information | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.2 | |
| | > | id | 1..1 | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (55752-0, LOINC, "Clinical Information") | |
| <i>Title</i> | > | title | 1..1 | SHALL | ST | | | |
| <i>Text</i> | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | component | 0..1 | MAY | | | | |
| <i>Request</i> | >> | section | 1..1 | SHALL | | | | 9.8.1 Request 1.2.840.10008.9.7 |
| | > | component | 0..1 | MAY | | | | |
| <i>Procedure Indications</i> | >> | section | 1..1 | SHALL | | | | 9.8.2 Procedure Indications 1.2.840.10008.9.22 |
| | > | component | 0..1 | MAY | | | | |
| <i>History</i> | >> | section | 1..1 | SHALL | | | | 9.8.3 Medical (General) History 2.16.840.1.113883.10.20.22.2.39 |
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

Example 9.2-1. Clinical Information section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.2"/>
  <id root="1.2.840.10213.2.62.994044785528.114289542805"/>
  <code code="55752-0" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Clinical Information"/>
  <title>Clinical Information</title>
  <text>The patient was referred for evaluation of suspected pulmonary embolism.</text>
  <!--see examples for other sections/entries -->
</section>

```

9.3 Imaging Procedure Description

| | |
|-------------------------|---|
| Template ID | 1.2.840.10008.9.3 |
| Name | Imaging Procedure Description |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | The Imaging Procedure Description section records the technical details of the procedure and may include information about protocol, imaging device, contrast, radiation dose, medications administered (sedation, stress agents), etc. |
| Classification | CDA Section Level |
| Relationships | Included in 7.1 Imaging Report |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------------------|------------|-------------------|------|----------------|-----------|------------|---|--|
| Procedure Description | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.3 | |
| | > | id | 1..1 | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (55111-9, LOINC, "Current Imaging Procedure Description") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 1..1 | SHALL | | | | |
| Procedure Technique | >> | procedure | 1..1 | SHALL | | | | 10.4 Procedure Technique 1.2.840.10008.9.14 |
| | > | entry | 0..* | MAY | | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------------------------|------------|---------------------------------|------|----------------|-----------|------------|-------|--|
| <i>Procedural Medication[*]</i> | >> | <i>substance Administration</i> | 1..1 | SHALL | | | | 10.2 Procedural Medication 1.2.840.10008.9.13 |
| | > | component | 0..1 | MAY | | | | |
| <i>Complications</i> | >> | <i>section</i> | 1..1 | SHALL | | | | 9.8.4 Complications 2.16.840.1.113883.10.20.22.2.37 |
| | > | component | 0..1 | COND | | | | |
| <i>Radiation Exposure</i> | >> | <i>section</i> | 1..1 | SHALL | | | | 9.8.5 Radiation Exposure and Protection Information 1.2.840.10008.9.8 |
| | > | component | 1..1 | SHALL | | | | |
| <i>DICOMObject Catalog</i> | >> | <i>section</i> | 1..1 | SHALL | | | | 9.8.7 DICOM Object Catalog 2.16.840.1.113883.10.20.6.1.1 |
| | > | entry | 0..1 | MAY | | | | |
| <i>ImageQuality</i> | >> | <i>observation</i> | 1..1 | SHALL | | | | 10.9 Image Quality 1.2.840.10008.9.15 |

Example 9.3-1. Current Imaging Procedure description section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.3"/>
  <id root="1.2.840.10213.2.62.9940434234785528.11428954534542805"/>
  <code code="55111-9" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Current Imaging Procedure Description"/>
  <title>Imaging Procedure Description</title>
  <text>A CT study was acquired with 2.5 mm images of the abdomen and pelvis with 140 ml of... </text>
  <!-- See Procedure Technique template example - required here -->
  <!-- See DICOM Imaging Catalog template example - required here -->
  <!--see examples for other sections/entries -->
</section>

```

9.3.1 component/section Radiation Exposure and Protection Information

COND: If the documented service utilizes ionizing radiation, a 9.8.5 Radiation Exposure and Protection Information section MAY be present.

9.4 Comparison Study

| | |
|----------------|-------------------|
| TemplateID | 1.2.840.10008.9.4 |
| Name | Comparison Study |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |

| | |
|-------------------------|--|
| Description | Documentation of a prior Imaging Procedure to which the current images were compared |
| Classification | CDA Section Level |
| Relationships | Included in 7.1 Imaging Report |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------|------------|-------------------|------|----------------|-----------|------------|--|---|
| Comparison Study | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.4 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (18834-2, LOINC, "Radiology Comparison study") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 0..* | MAY | | | | |
| Procedure Technique | >> | procedure | 1..1 | SHALL | | | | 10.4 Procedure Technique 1.2.840.10008.9.14 |
| | > | entry | 0..* | MAY | | | | |
| Study[*] | >> | act | 1..1 | SHALL | | | | 10.6 Study Act 1.2.840.10008.9.16 |
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

Example 9.4-1. Comparison study section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.4"/>
  <id root="1.2.840.10213.2.62.994056444785528.1142893564536542805"/>
  <code code="18834-2" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Radiology Comparison Study"/>
  <title>Comparison Study</title>
  <text>A prior CT with contrast performed on May 7, 2012, showed that ...</text>
  <! ---see examples for other sections/entries />
</section>

```

9.5 Findings

| | |
|-------------|-------------------------------|
| Template ID | 2.16.840.1.113883.10.20.6.1.2 |
|-------------|-------------------------------|

| | |
|-------------------------|---|
| Name | Findings |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Records clinically significant observations confirmed or discovered during the procedure. |
| Classification | CDA Section Level |
| Relationships | Included in 7.1 Imaging Report |
| Context | parent node |
| Open/Closed | Open |
| Revision History | From Consolidated CDA r1.1 DICOM-20150324: Added optional subsections and entries |

| Business Name | Nest Level | Element/ Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------|------------|--------------------|------|----------------|-----------|------------|--|---|
| Findings | | section | | | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.6.1.2 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (59776-5, LOINC, "Procedure Findings") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | component | 0..* | MAY | | | | |
| Fetus Findings[*] | >> | section | 1..1 | SHALL | | | | 9.8.8 Fetus Findings 1.2.840.10008.9.9 |
| | > | component | 0..* | MAY | | | | |
| Subsection[*] | >> | section | 1..1 | SHALL | | | | 9.8.9 Labeled Subsection 1.2.840.10008.9.10 |
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

9.5.1 text

If entries are present, the section/text SHALL represent faithfully all such statements and MAY contain additional text.

The narrative text associated with an actionable finding SHOULD be highlighted using styleCode Bold. See Section 9.1.1.1.

Actionable findings that require a specific follow-up action or procedure SHOULD be referenced from a recommendation in the 9.8.11 Recommendation section.

Communication of actionable findings SHOULD be documented in the 9.8.10 Communication of Actionable Findings section.

Example 9.5.1-1. Findings section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.6.1.2"/>
  <id root="1.2.840.10213.2.62.941494044785528.114289542452452805"/>
  <code code="59776-5" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Procedure Findings"/>
  <title>Findings</title>
  <text>
    <paragraph>
      <caption>Finding</caption>
      <content ID="Fndng2">The cardiomediatinum is... </content>
    </paragraph>
    <paragraph>
      <caption>Diameter</caption>
      <content ID="Diam2">45mm</content>
    </paragraph>
    ...
  </text>
  <entry>
    <templateId root="2.16.840.1.113883.10.20.6.2.12"/>
    ...
  </entry>
  <!-- see examples for other sections/entries -->
</section>

```

9.6 Impression

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.5 |
| Name | Impression |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | The most important diagnoses or other clinical conclusions that can be made from the imaging observations and other clinical information are recorded here. This section may include recommendations for additional imaging tests or other actions, as well as global assessments, such as BI-RADS Categories or the equivalent. |
| Classification | CDA Section Level |
| Relationships | Included in 7.1 Imaging Report |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|----------------|-----------|------------|-------------------|---------------------|
| Impression | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.5 | |
| | > | id | 1..* | SHALL | II | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------------------|------------|-------------------|------|----------------|-----------|------------|---------------------------------|--|
| | > | code | 1..1 | SHALL | CD | SHALL | (19005-8, LOINC, "Impressions") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | component | 0..1 | MAY | | | | |
| CommunicationOf Actionable Findings | >> | section | 1..1 | SHALL | | | | 9.8.10 Communication of Actionable Findings 1.2.840.10008.9.11 |
| | > | component | 0..1 | MAY | | | | |
| KeyImages | >> | section | 1..1 | SHALL | | | | 9.8.6 Key Images 1.3.6.1.4.1.19376. 1.4.1.2.14 |
| | > | component | 0..* | MAY | | | | |
| Recommendation | >> | section | 1..1 | SHALL | | | | 9.8.11 Recommendation 1.2.840.10008.9.12 |
| | > | entry | 0..* | MAY | | | | |
| Coded Observation | >> | observation | 1..1 | SHALL | CD | | | 10.1 Coded Observation 2.16.840.1.113883. 10.20.6.2.13 |

Example 9.6-1. Impression section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.2.27"/>
  <id root="1.2.840.10213.2.62.994948294044785528.11422458954285205"/>
  <code code="19005-8"
    codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC"
    displayName="Impressions"/>
  <title>Impression</title>
  <text>This exam identified ...</text>
  <!-- other sections and entries here -->
</section>

```

9.7 Addendum

| | |
|----------------|---|
| Template ID | 1.2.840.10008.9.6 |
| Name | Addendum |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Addendum section for imaging report includes supplemental information added to the original document contents.. |

| | |
|-------------------------|---------------------------------|
| Classification | CDA Section Level |
| Relationships | Included in 7.1 Imaging Report |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--------------------------------------|------------|-------------------|------|----------------|-----------|------------|------------------------------|---|
| Addendum[*] | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.6 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (55107-7, LOINC, "Addendum") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | author | 1..1 | SHALL | | | | |
| Time | >> | time | 1..1 | SHALL | TS | | | |
| | >> | assignedAuthor | 1..1 | SHALL | | | | |
| AuthorID | >>> | id | 1..* | SHALL | II | | | |
| | >>>> | assignedPerson | 1..1 | SHALL | | | | |
| AuthorName | >>>>> | name | 1..1 | SHALL | PN | | | |
| | > | component | 0..1 | MAY | | | | |
| Communication Of Actionable Findings | >> | section | 1..1 | SHALL | | | | 9.8.10 Communication of Actionable Findings 1.2.840.10008.9.11 |
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

9.7.1 author

Note that the Author identified in the document header is the author of the original report, as that participation sets the default authoring context for the report. The Author participation in this section shall be present, and identifies the author of the addendum, even if the same as the author of the original report.

9.7.2 component/section - Communication of Actionable Findings

It is possible for an imaging report to be legally signed (authenticated) prior to the Actionable Findings being properly communicated. In this event, an addendum to the imaging report is often created to document the communication of the actionable findings. This can be included in the section/text of the 9.7 Addendum, or using the 9.8.10 Communication of Actionable Findings subsection.

Example 9.7.2-1. Addendum section example

```
<section classCode="DOCSECT" moodCode="EVN" ID="Adndm">
  <templateId root="1.2.840.10008.9.6"/>
  <id root="1.2.840.10213.2.62.7906994044785528.1142895428068506"/>
```



```

<code code="55107-7" codeSystem="2.16.840.1.113883.6.1"
  codeSystemName="LOINC" displayName=" Addendum"/>
<title>Addendum</title>
<text>The supplemental information added to the original document...</text>
<author>
  <time value="20140605143000+0500"/>
  <assignedAuthor>
    <id extension="23454345" root="2.16.840.1.113883.19.5"/>
    <assignedPerson>
      <name><given>Henry</given> <family>Radiologist</family></name>
    </assignedPerson>
  </assignedAuthor>
</author>
</section>

```

9.8 Sub-sections

9.8.1 Request

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.7 |
| Name | Request |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Information about the requested imaging studies and associated tests. It may include information on the reason for the request, and on any validation of the request by clinical decision support against relevant appropriateness criteria. |
| Classification | CDA Section Level |
| Relationships | Included in 9.2 Clinical Information |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/ Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--------------------------|------------|--------------------|------|----------------|-----------|------------|-----------------------------|--|
| Request | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.7 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (55115-0, LOINC, "Request") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| CDSRecord Text[*] | >> | content | 0..* | MAY | ST | | | |
| * | >>@ | @ID | 1..1 | SHALL | XML ID | | | |

| | | | | | | | | |
|--|---|--|------|-----|--|--|--|--|
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |
|--|---|--|------|-----|--|--|--|--|

9.8.1.1 text/content and @ID – CDS Record

The Request section narrative text block MAY include content blocks recording clinical decision support assessments of the request with respect to the indications, patient characteristics, and relevant guidelines. Each such text/content SHALL include an XML ID attribute that serves as the business name discriminator associated with an instantiation of the element. Even if only one content block is instantiated, the ID attribute shall be present.

Example 9.8.1.1-1. Request section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.7" />
  <id root="1.2.840.10213.2.62.7906994785528.114289506"/>
  <code code="55115-0"
    codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC"
    displayName="Request" />
  <title>Request</title>
  <text>PTA (Iliac Angioplasty) for treatment of symptomatic
    atherosclerotic disease in both iliac arteries.
    <content ID="CDS001">Procedure ordered by Pat Smith, MD, NPI:8740944987.
      Classified APPROPRIATE by RadCDS based on ACR Select criteria
      at 2015-07-21 10:52:31 CDT</content>
  </text>
</section>
```

9.8.2 Procedure Indications

| | |
|-------------------------|---|
| Template ID | 2.16.840.1.113883.10.20.22.2.29 |
| Name | Procedure Indications |
| Effective Date | 2012-07 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Records details about the reason for the procedure. This section 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. |
| Classification | CDA Section Level |
| Relationships | Included in 9.2 Clinical Information |
| Context | parent node |
| Open/Closed | Open |
| Revision History | From Consolidated CDA r1.1 DICOM-20150324: adapted to use optional Coded Observation entry rather than optional Indication entry |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|----------------|-----------|------------|-------|---------------------|
|---------------|------------|-------------------|------|----------------|-----------|------------|-------|---------------------|

| | | | | | | | | |
|------------------------------|----|-------------|------|-------|-----|-------|---|--|
| Procedure Indications | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.22.2.29 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (59768-2, LOINC, "Procedure Indications") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 0..* | MAY | | | | |
| Coded Observation[*] | >> | observation | 1..1 | SHALL | | | See 9.8.2.1 entry/observation | 10.1 Coded Observation 2.16.840.1.113883.10.20.6.2.13 |

9.8.2.1 entry/observation

The binding to the Coded Observation concept domains is:

| Concept Domain or Element | Value Conf | Value |
|---------------------------|------------|---|
| ObservationType | SHOULD | (432678004, SNOMED, "Indication for procedure") |
| Other concept domains | | unspecified |

Note

In Consolidated CDA r1.1 the binding to the observationType is to Value Set Problem Type (2.16.840.1.113883.3.88.12.3221.7.2) with conformance SHOULD. Values from that Value Set are acceptable here as well.

Example 9.8.2.1-1. Procedure indications section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.2.29"/>
  <id root="1.2.840.10213.2.62.044785528.1142895426"/>
  <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 as a follow-up for abnormal screening result.</text>
</section>
```

9.8.3 Medical (General) History

| | |
|----------------|---------------------------------|
| Template ID | 2.16.840.1.113883.10.20.22.2.39 |
| Name | Medical (General) History |
| Effective Date | 2012-07 |
| Version Label | DICOM-20150324 |

| | |
|-------------------------|--|
| Status | Active |
| Description | History general describes all aspects of 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. It may also be reported as a collection of random clinical statements or it may be reported categorically. Categorical report formats may be divided into multiple subsections, including Past Medical History and Social History. |
| Classification | CDA Section Level |
| Relationships | Included in 9.2 Clinical Information |
| Context | parent node |
| Open/Closed | Open |
| Revision History | From Consolidated CDA r1.1 DICOM-20150324: Addition of optional entries; C-CDA templateID retained |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|----------------|-----------|------------|-------------------------------------|--|
| History | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.22.2.39 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (11329-0, LOINC, "History General") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

9.8.3.1 section/text

In the context of an Imaging Report, the section/text should document any contraindications to contrast administration or other procedure techniques that affected the selection or performance of the protocol.

Example 9.8.3.1-1. Medical (General) History section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.2.39"/>
  <id root="1.2.840.10213.2.62.7044785528.114289875"/>
  <code code="11329-0"
    codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC"
    displayName="History General"/>
  <title>Relevant Medical History</title>
  <text>
    <list>
      <item>Patient reported adverse reaction to iodine.</item>
      <item>Patient is smoker (1 pack daily).</item>
    </list>
  </text>
</section>
```

```

</list>
</text>
</section>

```

9.8.4 Complications

| | |
|-------------------------|---|
| Template ID | 2.16.840.1.113883.10.20.22.2.37 |
| Name | Complications |
| Effective Date | 2012-07 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | The Complications section records problems that occurred during the procedure or other activity. The complications may have been known risks or unanticipated problems. |
| Classification | CDA Section Level |
| Relationships | Included in 9.3 Imaging Procedure Description |
| Context | parent node |
| Open/Closed | Open |
| Revision History | From Consolidated CDA r1.1 DICOM-20150324: Addition of optional entries |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------------|------------|-------------------|------|----------------|-----------|------------|-----------------------------------|--|
| Complications | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.22.2.37 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (55109-3, LOINC, "Complications") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 0..* | MAY | | | | |
| Coded Observation[*] | >> | observation | | | | | | 10.1 Coded Observation 2.16.840.1.113883.10.20.6.2.13 |

Example 9.8.4-1. Complications section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.2.37"/>
  <id root="1.2.840.10213.2.62.70444786655528.11428987524546666"/>
  <code code="55109-3"
    codeSystem="2.16.840.1.113883.6.1"

```

```

codeSystemName="LOINC"
displayName="Complications"/>
<title>Complications</title>
<text>Immediately following IV contrast injection, the patient reporting itching "all over".
  Dr. Smith examined the patient and found multiple urticaria. The patient denied difficulty
  breathing or swallowing. The patient was given Benadryl 50 mg PO and was followed for
  30 minutes, during which time the symptoms subsided.</text>
<entry>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.13"/>
    <!-- Coded Observation -->
    ...
  </observation>
</entry>
</section>

```

9.8.5 Radiation Exposure and Protection Information

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.8 |
| Name | Radiation Exposure and Protection Information |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Contains information related to the radiation exposure and protection of the patient, as may be required by national or local legal requirements or standards. |
| Classification | CDA Section and Entry Level |
| Relationships | Included in 9.3 Imaging Procedure Description |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------------------|------------|-------------------|------|----------------|-----------|------------|---|--|
| Radiation Exposure | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >>@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.8 | |
| | > | code | 1..1 | SHALL | CD | SHALL | (73569-6, LOINC, "Radiation exposure and protection information") | |
| | > | id | 1..1 | SHALL | II | | | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | SHALL | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 0..1 | COND | | | | |
| | >> | procedure | 1..1 | SHALL | | | | |
| | >>@ | @classCode | 1..1 | SHALL | CS | SHALL | PROC | |
| | >>@ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |

| | | | | | | | | |
|---------------------------------------|-------|--------------------------|------|--------|----|-------|--|---|
| | >>> | code | 1..1 | SHALL | CD | SHALL | (121290, DCM, "Patient exposure to ionizing radiation") | |
| | >>> | participant | 1..1 | SHALL | | | | |
| | >>@ | @typeCode | 1..1 | SHALL | CS | SHALL | RESP | |
| | >>> | participantRole | 1..1 | SHALL | | | | |
| Irradiation AuthorizingID | >>>> | id | 1..1 | SHALL | II | | | |
| | >>>> | functionCode | 1..1 | SHALL | CE | SHALL | (113850, DCM, "Irradiation Authorizing") | |
| | >>>> | playingEntity | 1..1 | SHALL | | | | |
| Irradiation Authorizing Name | >>>>> | name | 1..1 | SHALL | PN | | | |
| | > | entry | 0..* | MAY | | | | |
| <i>SOPInstance[*]</i> | >> | <i>observation</i> | 1..1 | SHALL | | | | 10.8 SOP Instance Observation 1.2.840.10008.9.18 |
| | > | entry | 1..1 | COND | | | | |
| <i>Coded Observation [pregnancy]</i> | >> | <i>observation</i> | 1..1 | SHALL | | | [See 9.8.5.4 entry/observation Pregnancy] | 10.1 Coded Observation 2.16.840.1.113883.10.20.6.2.13 |
| | > | entry | 0..1 | MAY | | | | |
| <i>Coded Observation [indication]</i> | >> | <i>observation</i> | 1..1 | SHALL | | | [See 9.8.5.5 entry/observation Indication] | 10.1 Coded Observation 2.16.840.1.113883.10.20.6.2.13 |
| | > | entry | 0..* | MAY | | | | |
| <i>Quantity Measurement[*]</i> | >> | <i>observation</i> | 1..1 | | | | [See 9.8.5.6 entry/observation Dose Measurements] | 10.5 Quantity Measurement 2.16.840.1.113883.10.20.6.2.14 |
| | > | entry | 0..1 | MAY | | | | |
| | >> | substance Administration | | | | | | |
| | >>@ | @classCode | 1..1 | SHALL | | SHALL | SBADM | |
| | >>@ | @moodCode | 1..1 | SHALL | | SHALL | EVN | |
| | >>> | code | 1..1 | | | SHALL | (440252007, SNOMED, "Administration of radiopharmaceutical") | |
| Radioactivity Dose | >>> | doseQuantity | 0..1 | SHOULD | PQ | | | |
| | >>> | consumable | 1..1 | SHALL | | | | |
| | >>>> | manufactured Product | 1..1 | SHALL | | | | |
| | >>>>> | material | 1..1 | SHALL | | | | |

| | | | | | | | | |
|------------------------------|---------|---------------|------|--------|----|---------------|--|--|
| Radio pharmaceutical | >>>>>> | code | 1..1 | SHALL | CE | SHOULD CWE | ValueSet CID 25 "Radiopharmaceuticals", or CID 4021 "PET Radiopharmaceutical" | |
| FreeTextRadio pharmaceutical | >>>>>>> | original Text | 0..1 | SHOULD | ED | | | |

9.8.5.1 text

The section text SHALL contain information related to the radiation exposure and protection of the patient, as is required by state/national legal requirements or standards, for example:

- information on the indications for the procedure
- the name of the "Irradiation Authorizing" person who is the clinician responsible for determining that the irradiating procedure was appropriate for the indications.
- summary information on radiation exposure if ionizing is applied in the context of the current procedure (detailed specification of exposure is out of the scope of this textual summary).
- information on the radioactive substance administered if radioactive substance is administered in the context of the current procedure.

Note

Compare to TID 2008 "Radiation Exposure and Protection Information".

9.8.5.2 entry/procedure Patient Exposure

COND: If modality is CT, MG, NM, PT, XR, XA, or XF, the section SHOULD contain a procedure entry for the exposure of the patient to ionizing radiation.

This entry SHALL have a participant, the irradiation authorizing person who is the clinician responsible for determining that the irradiating procedure was appropriate for the indications.

Note

This may be the same person as the performing physician identified in the header.

9.8.5.3 entry/observation SOP Instance

The section may include reference to one or more DICOM Dose Report SOP Instances that provides a detailed record of exposure.

9.8.5.4 entry/observation Pregnancy

COND: A coded observation entry SHALL be present if the patient is female and child-bearing age.

The binding to the Coded Observation concept domains is:

| Concept Domain or Element | Value Conf | Value |
|---------------------------|------------|---|
| ObservationType | SHALL | (364320009, SNOMED, "Pregnancy observable") |
| ObservationValue | SHALL CNE | ValueSet CID 6096 Pregnancy Status |
| Other concept domains | | unspecified |

9.8.5.5 entry/observation Indication

An indication for procedure recorded in this section should be consistent with any indications identified in the 9.2 Clinical Information and/or 9.8.2 Procedure Indications section. It is included here for conformance with regulatory requirements in some jurisdictions for the indications to be specified in the context of the radiation exposure information.

The binding to the Coded Observation concept domains is:

| Concept Domain or Element | Value Conf | Value |
|---------------------------|------------|---|
| ObservationType | SHALL | (432678004, SNOMED, "Indication for procedure") |
| Other concept domains | | unspecified |

9.8.5.6 entry/observation Dose Measurements

The section may include multiple dose measurements. The binding to the Quantity Measurement concept domains is:

| Concept Domain or Element | Value Conf | Value |
|---------------------------|------------|--|
| ObservationType | SHALL CWE | ValueSet CID 10050 "Summary Radiation Exposure Quantities" |
| Other concept domains | | unspecified |

Example 9.8.5.6-1. Radiation Exposure and Protection section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.8" />
  <id root="1.2.840.10213.2.62.704478559484.11428372623"/>
  <code code="73569-6"
    codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC"
    displayName="Radiation Exposure And Protection Information"/>
  <title> Radiation Exposure and Protection Information</title>
  <text>A dosage of... </text>
  <entry>
    <procedure classCode="PROC" moodCode="EVN">
      <code code="121290"
        codeSystem="2.16.840.1.113883.6.1"
        codeSystemName="DCM"
        displayName="Patient exposure to ionizing radiation"/>
      <participant typeCode="RESP">
        <participantRole>
          <id root="2.16.840.1.113883.4.6" extension="980003719"/>
          <code code="113850"
            codeSystem="2.16.840.1.113883.6.1"
            codeSystemName="DCM"
            displayName="Irradiation Authorizing"/>
          <playingEntity>
            <name>
              <given>Martha</given>
              <family>Radiologist</family>
            </name>
          </playingEntity>
        </participantRole>
      </participant>
    </procedure>
  </entry>
  <entry>
    <observation classCode="OBS" moodCode="EVN" ID="pregnancy">
      <templateId root="2.16.840.1.113883.10.20.6.2.13"/>
      <id root="1.2.840.10213.2.62.7044779.114265201"/>
      <code code="364320009"
        codeSystem="2.16.840.1.113883.6.96"
```

```

    codeSystemName="SNOMED CT"
    displayName="Pregnancy observable"/>
<statusCode code="completed"/>
<value xsi:type="CD" code="60001007"
    codeSystem="2.16.840.1.113883.6.96"
    codeSystemName="SNOMED CT"
    displayName="not pregnant"/>
<effectiveTime value="20140914171504+0500"/>
</observation>
</entry>
</section>

```

9.8.6 Key Images

| | |
|-------------------------|--|
| ID | 1.3.6.1.4.1.19376.1.4.1.2.14 |
| Name | Key Images |
| Effective Date | 2011-07 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | The Key Images section contains narrative description of and references to DICOM Image Information Objects that illustrate the findings of the procedure reported. |
| Classification | CDA Section Level |
| Relationships | Included in 9.6 Impression |
| Context | parent node |
| Open/Closed | Open |
| Revision History | From IHE Cardiac Imaging Report Content DICOM-20150324: Addition of optional inline image (observationMedia) |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-----------------------|------------|-------------------|------|----------------|-----------|------------|--------------------------------|---|
| KeyImages | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.3.6.1.4.1.19376.1.4.1.2.14 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (55113-5, LOINC, "Key Images") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 0..* | SHOULD | | | | |
| SOPInstance[*] | >> | observation | 1..1 | SHALL | | | | |
| | > | entry | 0..* | MAY | | | | |
| Graphic[*] | >> | observationMedia | 1..1 | SHALL | | | | 10.3 observationMedia 1.3.6.1.4.1.19376.1.4.1.4.7 |

9.8.6.1 Section/text

The Key Images section text SHALL contain image references using linkHtml elements, where @href is a valid Web Access to DICOM Persistent Object (WADO) URL. See Section 9.1.1.5. The text content of linkHtml should be either visible text of the hyperlink, or a descriptor or identifier of the image; it may be associated with a (limited resolution) copy of the image (see Section 9.8.6.3).

9.8.6.2 SOP Instance Observation

The Key Images section SHOULD include 10.8 SOP Instance Observation entries equivalent to the linkHtml image references.

9.8.6.3 observationMedia

The Key Images section MAY include observationMedia entries with in-line encoded copies of the referenced images, linked into the narrative block using the renderMultiMedia markup. See Section 9.1.1.3. These in-line encoded images may have limited resolution and lossy compression as appropriate for inclusion in a report.

Example 9.8.6-1. Key Images section example

```
<section classCode="DOCSECT" moodCode="EVN">>
<templateId root="1.3.6.1.4.1.19376.1.4.1.2.14" />
<id root="1.2.840.10213.2.62.704478559484.11428372623" />
<code code="55113-5"
codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC"
displayName="Key Images"/>
<title>Key Images</title>
<text>Maximum extent of tumor is shown in
<linkHtml href="http://www.example.org/wado?requestType=WADO&...">image 1</linkHtml>
<renderMultiMedia referencedObject="refimag1"/>
</text>
<entry>
<!-- SOP Instance reference -->
<observation classCode=DGIMG moodCode=EVN ID="SOP1-2"/>
</entry>
<entry>
<!-- inline rendered image -->
<observationMedia ID="refimag1">
<value representation=B64 mediaType="image/jpeg">
Bgd3fsET4g...
</value>
</observationMedia>
</entry>
</section>
```

9.8.7 DICOM Object Catalog

| | |
|----------------|-------------------------------|
| Template ID | 2.16.840.1.113883.10.20.6.1.1 |
| Name | DICOM Object Catalog Section |
| Effective Date | 2012-07 |
| Version Label | CCDA-1.1 |
| Status | Active |

| | |
|-------------------------|--|
| Description | DICOM Object Catalog lists all referenced objects and their parent Series and Studies, plus other DICOM attributes required for retrieving the objects. The DICOM Object Catalog section is not intended for viewing and may contain empty section text. |
| Classification | CDA Section Level |
| Relationships | Included in 9.3 Imaging Procedure Description |
| Context | parent node |
| Open/Closed | Open |
| Revision History | From Consolidated CDA r1.1 |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|----------------|-----------|------------|---------------------------------------|---|
| DICOMCatalog | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.6.1.1 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (121181, DCM, "Dicom Object Catalog") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | SHALL | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | entry | 0..* | SHOULD | | | | |
| Study[*] | >> | act | 1..1 | SHALL | | | | 10.6 Study Act 2.16.840.1.113883.10.20.6.2.6 |

Example 9.8.7-1. DICOM object catalog section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.6.1.1"/>
  <id root="1.2.840.10213.2.62.70447834679.11429737"/>
  <code code="121181"
    codeSystem="1.2.840.10008.2.16.4"
    codeSystemName="DCM"
    displayName="DICOM Object Catalog"/>
  <entry>
    <!-- **** Study Act **** -->
    <act classCode="ACT" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.6.2.6"/>
      <id root="1.2.840.113619.2.62.994044785528.114289542805"/>
      <code code="113014" codeSystem="1.2.840.10008.2.16.4"
        codeSystemName="DCM" displayName="Study"/>
      <!-- **** Series Act **** -->
      <entryRelationship typeCode="COMP">
        <act classCode="ACT" moodCode="EVN">
          <id root="1.2.840.113619.2.62.994044785528.20060823223142485051"/>
          <code code="113015" codeSystem="1.2.840.10008.2.16.4"
            codeSystemName="DCM" displayName="Series">
            ...

```

```

</code>
<!-- **** SOP Instance UID *** -->
<!-- 2 References -->
<entryRelationship typeCode="COMP">
  <observation classCode="DGIMG" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.8"/>
    ...
  </observation>
</entryRelationship>
<entryRelationship typeCode="COMP">
  <observation classCode="DGIMG" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.8"/>
    ...
  </observation>
</entryRelationship>
</act>
</entryRelationship>
  </act>
</entry>

```

9.8.8 Fetus Findings

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.9 |
| Name | Fetus Findings |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Records observations related to a fetus confirmed or discovered during an imaging procedure. |
| Classification | CDA Section Level |
| Relationships | Included in 9.5 Findings |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--------------------------|------------|-------------------|------|----------------|-----------|------------|---|--|
| Fetus Findings[*] | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.9 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (76514-9, LOINC, "Fetal Study observation") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | subject | 1..1 | SHALL | | | | |

| | | | | | | | | |
|----------------------|------|----------------|------|-------|----|-------|------------------------|---|
| | >> | relatedSubject | 1..1 | SHALL | | | | |
| | >>> | code | 1..1 | SHALL | CE | SHALL | (121026, DCM, "Fetus") | |
| | >>> | subject | 1..1 | SHALL | | | | |
| FetusID | >>>> | name | 1..1 | SHALL | PN | | | |
| | > | component | 0..* | MAY | | | | |
| <i>Subsection[*]</i> | >> | <i>section</i> | 1..1 | SHALL | | | | 9.8.9 Labeled Subsection 1.2.840.10008.9.10 |
| | > | | 0.1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

For reports on mothers and their fetus(es), information on a mother is mapped to recordTarget/PatientRole/Patient in the CDA header. Information on the fetus is mapped to subject/relatedSubject/SubjectPerson at the CDA section level. Both context information on the mother and fetus must be included in the document if observations on fetus(es) are contained in the document.

9.8.8.1 name - FetusID

The subject/relatedSubject/subject/name element is used to store the fetus ID, typically a pseudonym such as "fetus A". This shall be present even if only one fetus is identified in the document.

Example 9.8.8-1. Fetus Findings section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.2.27" />
  <id root="1.2.840.10213.2.62.70447834679.11429737"/>
  <code code="76514-9" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Fetal Study observation" />
  <title>Fetus #1</title>
  <text>Estimated gestational age of 27 weeks... </text>
  <relatedSubject>
    <code code="121026" codeSystem="1.2.840.10008.2.16.4" displayName="Fetus"/>
    <subject>
      <name>Fetus 1</name>
    </subject>
  </relatedSubject>
</section>
```

9.8.9 Labeled Subsection

| | |
|-----------------------|--|
| Template ID | 1.2.840.10008.9.10 |
| Name | Labeled Subsection |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Narrative or coded subsection that allows organization of content for a labeled topic (a particular organ or anatomic feature, a lesion, a tumor, etc.). The section.code shall be absent, but the section.title shall be present. |
| Classification | CDA Section Level |

| | |
|-------------------------|---------------------------------|
| Relationships | Included in 9.5 Findings |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|-----------------|-----------|------------|---------------------|---|
| Subsection[*] | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.10 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 0..0 | SHALL NOT | | | | |
| Title | > | title | 1..1 | SHALL noNull | ST | | [See 9.8.9.1 title] | |
| Text | > | text | 1..1 | COND | ED | | | 9.1.1 Section Text 1.2.840.10008.9.19 |
| | > | component | 0..* | MAY | | | | |
| Subsection[*] | >> | section | 1..1 | SHALL | | | | 9.8.9 Labeled Subsection 1.2.840.10008.9.10 |
| | > | | 0..1 | MAY | | | | 9.1.2 General Section Entries 1.2.840.10008.9.23 |

9.8.9.1 title

The title element is used to identify the topic (specific organ or anatomic feature, abnormality, lesion, etc.) as the subject of the subsection findings in the human readable document. As there is no section.code, this is the required mechanism to represent the section purpose as free text.

9.8.9.2 component/section Labeled Subsection

This template invokes itself recursively to allow arbitrarily deep nested subsections.

Example 9.8.9.2-1. Labeled sub-section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.10" />
  <id root="1.2.840.10213.2.62.7044794679.114296787"/>
  <title>Liver</title>
  <text>No evidence of cirrhosis, nodular regeneration, or ... </text>
</section>
```

9.8.10 Communication of Actionable Findings

| | |
|-----------------------|--------------------------------------|
| Template ID | 1.2.840.10008.9.11 |
| Name | Communication of Actionable Findings |
| Effective Date | 2015/03/24 |

| | |
|-------------------------|---|
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | <p>A section that documents the notification of an actionable finding to a provider or other person responsible for patient care. The documentation in narrative text, and optionally in a coded entry, includes by whom, to whom, and at what date/time.</p> <p>Specific findings, including actionable (aka. critical) findings documented in text or as coded entries, are typically found in the 9.5 Findings. The actionable findings may be duplicated in the 9.6 Impression in either text or as coded entries. The actionable findings may be new (critical) or a change to a previous report/diagnosis (discrepant).</p> |
| Classification | CDA Section and Entry Level |
| Relationships | Included in 9.6 Impression and 9.7 Addendum |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/ Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------------------|------------|-----------------------|------|-------------------|-----------------|---------------|---|------------------------|
| Actionable Findings | | section | 1..1 | SHALL | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.11 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (73568-8, LOINC, "Communication of Critical Results") | |
| Title | > | title | 1..1 | SHALL | ST | | | |
| | > | text | 1..1 | SHALL | ED | | | |
| Content[*] | >> | content | 0..* | SHALL | ST | | [See 9.8.10.1 section/text/content - narrative] | |
| * | >>@ | @ID | 1..1 | SHALL | XML ID | | | |
| FindingRef | >>> | linkHtml | 0..* | MAY | ST | | | |
| FindingURI | >>>@ | @href | 1..1 | SHALL | URL (XML IDREF) | | # <i>findingRef</i> | |
| | > | entry | 0..* | SHOULD | | | | |
| Communication[*] | >> | act | 1..1 | SHALL | | SHALL | | |
| | >>@ | @classCode | 1..1 | SHALL | CS | SHALL | ACT | |
| | >>@ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| * | >>@ | @ID | 1..1 | SHALL | XML ID | | | |
| | >>> | code | 1..1 | SHALL | CD | SHALL | (121291, DCM, "Results communicated") | |
| CommTime | >>> | effectiveTime | 1..1 | SHALL | TS | | | |
| | >>> | text | 1..1 | SHALL | ED | | | |
| Ref | >>>> | reference | 1..1 | SHALL | URL (XML IDREF) | | # <i>contentRef</i> | |
| | >>> | performer | 1..1 | SHALL | | | | |

| | | | | | | | | |
|--------------------------------|---------|-----------------|------|-------|-----|-------|-----|--|
| | >>>> | assignedEntity | 1..1 | SHALL | | | | |
| | >>>>> | assignedPerson | 1..1 | SHALL | | | | |
| ReportingPhysician Name | >>>>>> | name | 1..1 | SHALL | PN | | | |
| | >>> | participant | 1..1 | SHALL | | | | |
| | >>>@ | @typeCode | 1..1 | SHALL | CS | SHALL | NOT | |
| | >>>> | participantRole | 1..1 | SHALL | | | | |
| NotificationContact Telecom | >>>>>> | telecom | 1..1 | SHALL | TEL | | | |
| | >>>>>> | playingEntity | 1..1 | SHALL | | | | |
| NotificationContact Name | >>>>>>> | name | 1..1 | SHALL | PN | | | |

9.8.10.1 section/text/content - narrative

Each documented act of communication of actionable findings SHALL be included as narrative in a section/text/content element, labeled with an XML ID (see Section 9.1.1.1).

Note

The following text content for such a block is specified in the RSNA Radiology Reporting Templates, Template 297: Communication of Actionable Finding (<http://radreport.org/txt-mrrt/0000297>):

method [discussed directly | discussed by telephone | described in message]

by [person]

to [person]

on [<date>] at [<time>]

The documentation may also provide a linkHtml reference to the actionable finding narrative elsewhere in the report, e.g., in the 9.5 Findings or 9.8.4 Complications section (see Section 9.1.1.2).

9.8.10.2 entry/act

A structured entry representation of the act of communication MAY be included in the section. This entry does not necessarily represent the entirety of the act as described in the narrative text, e.g., the communication method and actual content of the communication is not represented, nor whether the receiver acknowledged the communication ("read-back"). The act/text/reference element SHALL include an XML IDREF value pointing to the associated narrative content block.

9.8.10.3 entry/act/effectiveTime

The entry/act/effectiveTime element represents the date and time that actionable findings were communicated. The time that the findings were first observed is recorded in the effectiveTime element of the original observation, as linked through the section/text/content/linkHtml element.

9.8.10.4 entry/act/participant

The entry/act/participant element represents the notified party (@typecode = "NOT"). This could be the patient.

Example 9.8.10-1. Communication of Actionable Results section example

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.11"/>
  <id root="1.2.840.10213.2.62.7044794679.114296787"/>
  <code code="73568-8"
    codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC"
    displayName="Communication of Critical Results"/>
  <title>Communication of Actionable Results</title>
  <text>
    <content ID=CR1>Dr. Smith was phoned at 262-966-0120 at 3:14pm on
      Wednesday, June 4, 2014, and the 4mm lung nodule was discussed directly
      with Dr. Smith to explain the follow-up recommendation of ...</content>
  </text>
  <entry>
    <act classCode="ACT" moodCode="EVN">
      <code code="121291"
        codeSystem="1.2.840.10008.2.16.4"
        codeSystemName="DCM"
        displayName="Results Communicated"/>
      <text>
        <reference value="#CR1"/>
      </text>
      <effectiveTime value="20140604221400-0700"/>
      <performer>
        <assignedEntity>
          <id root="1.2.840.10213.2.62.7044794679.114298686"/>
          <assignedPerson>
            <name>Jane Doctor</name>
          </assignedPerson>
        </assignedEntity>
      </performer>
      <participant typeCode="NOT">
        <participantRole>
          <telecom value="tel:262-966-0120"/>
          <playingEntity>
            <name>Dr. Smith</name>
          </playingEntity>
        </participantRole>
      </participant>
    </act>
  </entry>
</section>

```

9.8.11 Recommendation

| | |
|-----------------------|---|
| Template ID | 1.2.840.10008.9.12 |
| Name | Recommendation |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | This section provides a separate section to describe the study interpreter's recommendations for follow-up studies or procedures. |

| | |
|-------------------------|---------------------------------|
| Classification | CDA Section Level |
| Relationships | Included in 9.6 Impression |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/ Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------------------|------------|-----------------------|------|-------------------|-----------------|---------------|--|------------------------|
| Recommendation | | section | | | | | | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.12 | |
| | > | id | 1..* | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (18783-1, LOINC, "Study recommendation") | |
| Title | > | title | 0..1 | MAY | ST | | | |
| Text | > | text | 0..1 | SHALL | ED | | | |
| Content[*] | >> | content | 0..* | SHALL | ST | | [See 9.8.11.1 text/content] | |
| * | >>@ | @ID | 1..1 | SHALL | XML ID | | | |
| GuidelineRef | >>> | linkHtml | 0..1 | MAY | ST | | | |
| GuidelineURI | >>>@ | @href | 1..1 | SHALL | URI | | | |
| | > | entry | 0..* | SHOULD | | | | |
| Followup Procedure[*] | >> | procedure | 1..1 | SHALL | | | | |
| | >>@ | @classCode | 1..1 | SHALL | CS | SHALL | PROC | |
| | >>@ | @moodCode | 1..1 | SHALL | CS | SHALL | PRP | |
| ProcedureCode | >>> | code | 1..1 | SHALL | CD | | ConceptDomain Recommended Follow-up | |
| When | >>> | effectiveTime | 1..1 | SHOULD | IVL <TS> | | | |
| | >>> | text | 1..1 | SHALL | ED | | | |
| Ref | >>>> | reference | 1..1 | SHALL | URL (XML IDREF) | | # contentRef | |

9.8.11.1 text/content

Each documented recommendation SHALL be included as narrative in a content element, labeled with an XML ID (see Section 9.1.1.1 <content> Markup and Links From Entries). The content element NEED NOT be top level markup within the section/text element; it MAY be wrapped in another allowed narrative block markup, such as paragraph, list/item, or table/row/cell.

If the recommendation is based on a clinical guideline, a reference to that guideline MAY be included in a linkHtml element.

Each recommendation SHOULD have a corresponding structured entry.

9.8.11.2 entry/procedure

The Recommendation section SHOULD include entries for recommended follow-up actions or procedures.

Note

While this entry may be a trigger for a tracking system for ensuring follow up on recommendations, the imaging study report only conveys the interpreting physician's recommendations.

9.8.11.3 entry/procedure/code

Vocabulary binding for Concept Domain Recommended Follow-up may be further profiled in sub-specialty guidelines.

Note

An example would be Value Set CID 6028 "Mammography Recommended Follow-up", incorporating concepts from ACR BI-RADS[®].

9.8.11.4 entry/procedure/effectiveTime

The HL7v3 IVL <TS> Data Type used for effectiveTime requires the specification of absolute dates, rather than a date relative to the date of the report.

Note

Thus the concept "follow-up within one year" needs to be encoded as a IVL <TS> with an effectiveTime/high element value one year after the date of the report.

9.8.11.5 entry/procedure/text/reference

The procedure entry SHALL include a text/reference element, whose value attribute SHALL begin with a '#' and SHALL point to its corresponding narrative content block. See Section 9.1.1.1.

Example 9.8.11-1. Radiology recommendation section example

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.12" />
  <id root="1.2.840.10213.2.62.7044779.114265201"/>
  <code code="18783-1" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Study Recommendation"/>
  <title>Radiology Recommendation</title>
  <text>
    <content ID="rec01">Biopsy should be considered. Follow-up at 3 month interval.
    </content>
    <linkHtml href="http://pubs.rsna.org/doi/abs/10.1148/radiol.2372041887"/>
  </text>
  <entry>
    <procedure ID="RadRec1" classCode="PROC" moodCode="PRP"/>
    <!-- local coding scheme -->
    <code code="9191919" codeSystem="2.16.840.1.56789.6.1"
      codeSystemName="My Hospital Coding System"
      displayName="3 month follow-up"/>
    <text><reference value="#rec01"/></text>
    <effectiveTime value="20141213"/>
  </entry>
</section>
```

10 Entry-level Templates

10.1 Coded Observation

| | |
|------------------|--|
| Template ID | 2.16.840.1.113883.10.20.6.2.13 |
| Name | Coded Observation |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Qualitative or categorical observation using a value of type CD. |
| Classification | CDA Entry Level |
| Relationships | Included in all sections |
| Context | parent node |
| Open/Closed | open |
| Revision History | From Consolidated CDA r1.1 DICOM-20150324: Added optional negationInd, interpretationCode, targetSiteCode, and methodCode with Business Names; added optional subject Coded Observation |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------------|------------|--------------------|------|----------------|-----------------|------------|---|---------------------|
| Coded Observation[*] | | observation | | | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | OBS | |
| | @ | @moodCode | 1..1 | SHALL | | SHALL | EVN | |
| Not | @ | @negationInd | 0..1 | MAY | BL | SHALL | true | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.6.2.13 | |
| | > | id | 1..1 | SHALL | II | | | |
| ObsName | > | code | 1..1 | SHALL | CD | | ConceptDomain ObservationType | |
| | > | text | 0..1 | SHOULD | ED | | | |
| Ref | >> | reference | 1..1 | SHALL | URL (XML IDREF) | | # contentRef | |
| | > | statusCode | 1..1 | SHALL | CS | SHALL | COMPLETED | |
| Time | > | effectiveTime | 0..1 | SHOULD | TS | | | |
| ObsValue | > | value | 1..1 | SHALL | CD | | ConceptDomain ObservationValue | |
| | >@ | @xsi:type | 1..1 | SHALL | ST | SHALL | CD | |
| Interpretation Code | > | interpretationCode | 0..1 | MAY | CE | SHALL CNE | ValueSet ObservationInterpretation Value Set 2.16.840.1.113883.11.78 | |

| Business Name | Nest Level | Element/ Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------|------------|--------------------|------|----------------|-----------|--------------|---|--|
| Actionable Priority | >> | translation | 0..1 | MAY | CD | MAY CWE | ValueSet CID 7035 "Actionable Finding Classification" [See 10.1.3 interpretationCode and translation For Actionable Findings] | |
| TargetSite | > | targetSiteCode | 1..1 | COND | CD | | ConceptDomain ObservationSite | |
| | >> | qualifier | 0..1 | COND | | | | |
| | >>> | name | 1..1 | SHALL | CD | SHALL | (272741003, SNOMED CT, "laterality") | |
| Laterality | >>> | value | 1..1 | SHALL | CD | SHALL CNE | ValueSet CID 244 "Laterality" | |
| | >> | qualifier | 0..1 | COND | | | | |
| | >>> | name | 1..1 | SHALL | CD | SHALL | (106233006, SNOMED CT, "topographical modifier") | |
| TopoModifier | >>> | value | 1..1 | SHALL | CD | SHALL CNE | ValueSet CID 2 "Anatomic Modifier" | |
| Method | > | methodCode | 0..1 | MAY | CD | | ConceptDomain ObservationMethod | |
| | > | entry Relationship | 0..* | MAY | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | SPRT | |
| SOPInstance[*] | >> | observation | 1..1 | SHALL | | | | 10.8 SOP Instance Observation 1.2.840.10008.9.18 |
| | > | entry Relationship | 0..* | MAY | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | SPRT | |
| Quantity Measurement[*] | > | observation | 1..1 | SHALL | | | | 10.5 Quantity Measurement 2.16.840.1.113883. 10.20.6.2.14 |
| | > | entry Relationship | 0..* | MAY | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | SUBJ | |
| Coded Observation[*] | > | observation | 1..1 | SHALL | | | | 10.1 Coded Observation 2.16.840.1.113883. 10.20.6.2.13 |

10.1.1 code and @negationInd

The Observation code element has an associated Concept Domain ObservationType. A representative binding for this Concept Domain is to the value (ASSERTION, actcode[2.16.840.1.113883.5.4], "Assertion"), providing an assertion of a finding concept in the value element.

The Observation may have @negationInd attribute "true", which together with the code "ASSERTION" indicates that the finding was not observed, e.g., to represent "No finding of stroke".

Note

This is the pattern used in Consolidated CDA for negative findings.

10.1.2 text/reference and Related Narrative Block Markup

The Observation entry SHOULD include a text/reference element, whose value attribute (not to be confused with the value element of the Observation class) SHALL begin with a '#' and SHALL point to its corresponding narrative in the parent section (using the approach defined in CDA Release 2, section 4.3.5.1). See Section 9.1.1.1.

10.1.3 interpretationCode and translation For Actionable Findings

When an observation is unexpected or "actionable" (one type of which is denoted a "critical finding"), it may be flagged using the interpretationCode. For very abnormal findings the interpretationCode element SHALL be set to (AA, ObservationInterpretation, "abnormal alert"). Unexpected normal findings, e.g., no findings of disease when patient treatment had been planned on the presumption of disease, may also be flagged using interpretationCode (N, ObservationInterpretation, "normal").

The translation element of the interpretationCode may be used to provide a further classification as defined in a regionally- or professionally-specified value set. This template identifies an optional value set for the ACR Actionable Finding categories 1, 2, and 3, as defined by: Larson PA, et al. J Am Coll Radiol 2014; published online. DOI 10.1016/j.jacr.2013.12.016.

The narrative text associated with the actionable finding SHOULD be highlighted using styleCode Bold. See Section 9.5.1 and Section 9.1.1.1.

Actionable findings that require a specific follow-up action or procedure SHOULD be referenced from a recommendation in the 9.8.11 Recommendation section.

Communication of actionable findings SHOULD be documented in the 9.8.10 Communication of Actionable Findings section.

10.1.4 targetSiteCode

Each observation needs to fully specify its site/location.

COND: If the observation site is not pre-coordinated in the observation/code or observation/value, it SHALL be specified in the observation/targetSiteCode.

COND: The qualifier element for laterality SHALL be present if the targetSiteCode represents a paired body part and laterality is not pre-coordinated in the targetSiteCode.

Note that inclusion in a labeled subsection (see Section 9.8.9) does not imply a finding site for the observation from the title. The title is not semantically part of the post-coordination.

10.1.5 entryRelationship/@typeCode=SUBJ/observation - Coded

The Coded Observation entry MAY include an actRelationship of type SUBJ (has subject) to a subsidiary Coded Observation (recursively invoking this same template). This allows the constructions of complex clinical statements.

Example 10.1-1. Coded observation example

```
<text>
...
<content ID="fnd-1"> ...finding of a right hilar mass (abnormal - class 1) ...</content>
</text>
...
<entry>
  <observation classCode="OBS" moodCode="EVN">
```

```

<templateId root="2.16.840.1.113883.10.20.6.2.13"/>
<id root="1.2.840.10213.2.62.7044779.114265201"/>
<code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"
  codeSystemName="actCode"
  displayName="Assertion"/>
<text><reference value="#fnd-1"/></text>
<statusCode code="completed"/>
<effectiveTime value="20140914171504+0500"/>
<value xsi:type="CD" code="309530007"
  codeSystem="2.16.840.1.113883.6.96"
  codeSystemName="SNOMED CT"
  displayName="Hilar mass"/>
<interpretationCode code = "AA" codeSystem="2.16.840.1.113883.5.83"
  codeSystemName="ObservationInterpretation"
  displayName="Abnormal Alert">
  <translation code="RID49480" codeSystem="2.16.840.1.113883.6.256"
    codeSystemName="RADLEX"
    displayName="ACR Category 1 Actionable Finding"/>
</interpretationCode>
<!-- although "hilar mass" is by definition in the lung, the observation.value
  does not describe right or left lung, so targetSite is required -->
<targetSiteCode code="3341006"
  codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
  displayName="right lung">
</targetSiteCode>
<!-- entryRelationship elements referring to SOP Instance Observations
  or Quantity Measurement Observations may appear here -->
</observation>
</entry>

```

10.2 Procedural Medication

| | |
|-------------------------|--|
| Template ID | 1.2.840.10008.9.13 |
| Name | Procedural Medication |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | Procedural medication describes a substance administration that has actually occurred prior to or during a procedure (e.g., imaging contrast/agents, anti-histamines, anti-anxiety, beta blockers to control heart rate during procedure, etc.). |
| Classification | CDA Entry Level |
| Relationships | Included in 9.3 Imaging Procedure Description |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|--|------------|--------------------------|------|----------------|-----------|------------|-------|---------------------|
| Procedural Medication[*] or Contrast[*] | | substance Administration | 1..1 | SHALL | | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------------|------------|-----------------------|------|----------------|-----------------|---------------|--|---------------------|
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | SBADM | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.13 | |
| | > | id | 1..1 | SHALL | II | | | |
| | > | text | 0..1 | SHOULD | ED | | | |
| Ref | >> | reference | 0..1 | SHOULD | URL (XML IDREF) | | #contentRef | |
| | > | statusCode | 1..1 | SHALL | CS | SHALL | COMPLETED | |
| Route | > | routeCode | 0..1 | MAY | CE | SHOULD CWE | ValueSet CID 11 "Route of Administration" | |
| Dose | > | doseQuantity | 0..1 | SHOULD | PQ | | | |
| DoseUnit | >@ | @unit | 0..1 | SHOULD | | SHALL CNE | ValueSet CID 82 "Units of Measurement" | |
| Rate | > | rateQuantity | 0..1 | MAY | PQ | | | |
| RateUnit | >@ | @unit | 1..1 | SHALL | CS | SHALL CNE | ValueSet CID 82 "Units of Measurement" | |
| | > | consumable | 1..1 | SHALL | | | | |
| | >> | manufactured Product | 1..1 | SHALL | | | | |
| | >>@ | @classCode | 1..1 | SHALL | CS | SHALL | MANU | |
| | >>> | manufactured Material | 1..1 | SHALL | | | | |
| CodedProduct Name | >>>> | code | 1..1 | SHALL | CE | | ConceptDomain MedContrastName | |
| FreeText ProductName | >>>>> | original Text | 0..1 | SHOULD | ED | | | |

10.2.1 Business Name Alias

This template defines a primary scoping business name "ProceduralMedication" and an alias "Contrast". This allows production logic to use either term, although the structure is identical.

10.2.2 text/reference and Related Narrative Block Markup

The substanceAdministration entry SHOULD include a text/reference element, whose value attribute SHALL begin with a '#' and SHALL point to its corresponding narrative in the parent section (using the approach defined in CDA Release 2, section 4.3.5.1). See Section 9.1.1.1.

10.2.3 doseQuantity

- Pre-coordinated consumable: If the consumable code is a pre-coordinated unit dose (e.g., "metoprolol 25mg tablet") then doseQuantity is a unitless number that indicates the number of products given per administration (e.g., "2", meaning 2 x "metoprolol 25mg tablet").

- Not pre-coordinated consumable: If the consumable code is not pre-coordinated (e.g., is simply "metoprolol"), then doseQuantity must represent a physical quantity with @unit, e.g., "25" and "mg", specifying the amount of product given per administration.

Example 10.2-1. Procedural Medication activity example

```
<substanceAdministration classCode="SBADM" moodCode="EVN">
  <templateId root="1.2.840.10008.9.13"/>
  <id root="cbbd33f0-6cde-11db-9fe1-0800200c9a66"/>
  <text>
    <reference value="#med1"/>
  </text>
  <statusCode code="completed"/>
  <routeCode code="47625008" codeSystem="2.16.840.1.113883.6.96"
    codeSystemName="SNOMED CT" displayName="intravenous route"/>
  <doseQuantity value="100" unit="ml"/>
  <consumable>
    <manufacturedProduct classCode="MANU">
      <templateId root="2.16.840.1.113883.10.20.22.4.23"/>
      <id/>
      <manufacturedMaterial>
        <code code="412372002"
          codeSystem="2.16.840.1.113883.6.96"
          codeSystemName="SNOMED CT"
          displayName="Meglumine Diatrizoate">
          <originalText>
            <reference value="#manmat1"/>
          </originalText>
          <translation code="3320"
            codeSystem="2.16.840.1.113883.6.88" codeSystemName="RxNorm"
            displayName="Diatrizoate Meglumine"/>
        </code>
      </manufacturedMaterial>
    </manufacturedProduct>
  </consumable>
</substanceAdministration>
```

10.3 observationMedia

| | |
|-----------------------|--|
| Template ID | 1.3.6.1.4.1.19376.1.4.1.4.7 |
| Name | observationMedia Entry |
| Effective Date | 2011-07 |
| Version Label | IHECIRC-TI |
| Status | Active |
| Description | The observationMedia Entry provides an in-line graphic depiction of the section findings. It is referenced by a <renderMultiMedia> element in the section text. Typical uses are for graphic representation of findings (e.g., arterial tree diagrams) or in-line representations of key images. |
| Classification | CDA Entry Level |
| Relationships | |
| Context | parent node |
| Open/Closed | Open |

| | |
|-------------------------|---|
| Revision History | From IHE Cardiac Imaging Report Content Profile Supplement for Trial Implementation |
|-------------------------|---|

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|----------------|-----------|------------------------|--|---------------------|
| Graphic[*] | | observationMedia | 1..1 | SHALL | | | | |
| | @ | classCode | 1..1 | SHALL | CS | OBS | | |
| | @ | moodCode | 1..1 | SHALL | CS | EVN | | |
| * | @ | @ID | 1..1 | SHALL | XML ID | | [See 5.3.4 XML ID] | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.3.6.1.4.1.19376.1.4.1.4.7 | |
| | > | id | 1..1 | SHALL | II | | | |
| Image | > | value | 1..1 | SHALL | ED | | | |
| | >@ | @representation | 1..1 | SHALL | CS | SHALL | B64 | |
| MediaType | >@ | @mediaType | 1..1 | SHALL | CS | SHALL CNE STATIC | ValueSet ImageMediaType Value Set 2.16.840.1.113883.11.14839 | |
| ImageURI | >> | reference | 0..1 | MAY | TEL | | | |

10.3.1 observationMedia/@ID and Related Narrative Block Markup

The ObservationMedia entry SHALL include an XML ID attribute (not to be confused with the id element of the act class) used as a target of a <renderMultiMedia> element in the section/text narrative block of the parent section. See Section 9.1.1.3.

10.3.2 value and Reference

The value of type ED SHALL contain an in-line encoding of a graphic using base64. The <reference> element, if present, SHALL reference a URI for the same image as included in-line.

Example 10.3-1. Observation Media activity example

```
<observationMedia classCode="SBADM" moodCode="EVN" ID="obsMedia-1">
  <templateId root="1.3.6.1.4.1.19376.1.4.1.4.7"/>
  <id root="1.2.840.19432234.2342342.23232232"/>
  <value representation="B64" mediaType="image/jpeg">
    Bgd3fsET4g...
  </value>
</observationMedia>
```

10.4 Procedure Technique

| | |
|-----------------------|---------------------|
| Template ID | 1.2.840.10008.9.14 |
| Name | Procedure Technique |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |

| | |
|-------------------------|--|
| Description | The Procedure Technique entry allows the encoding of various parameters of the image acquisition. Other details may be found in other entries (e.g., procedural medication). |
| Classification | CDA Entry Level |
| Relationships | Included in 9.3 Imaging Procedure Description and 9.4 Comparison Study |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial version |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-----------------------|------------|-------------------|------|----------------|-----------------|------------|--|---------------------|
| Procedure Technique | | procedure | 1..1 | SHALL | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | PROC | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | | 1.2.840.10008.9.14 | |
| | > | id | 1..1 | SHALL | II | | | |
| Procedure Code | > | code | 1..1 | SHALL | CD | | ConceptDomain ProcedureCode | |
| | > | text | 0..1 | SHOULD | ED | | | |
| Ref | >> | reference | 1..1 | SHALL | URL (XML IDREF) | | # <i>contentRef</i> | |
| EffectiveTime | > | effectiveTime | 0..1 | SHOULD | IVL <TS> | | | |
| Modality | > | methodCode | 1..* | SHALL | CD | SHALL CNE | ValueSet CID 29 "Acquisition Modality" | |
| MethodCode | > | methodCode | 0..* | MAY | CD | | ConceptDomain ImagingTechnique | |
| TargetSite | > | targetSiteCode | 0..* | SHOULD | CD | | ConceptDomain TargetSite | |
| | >> | qualifier | 0..1 | COND | | | | |
| | >>> | name | 1..1 | SHALL | CD | SHALL | (272741003, SNOMED CT, "laterality") | |
| Laterality | >>> | value | 1..1 | SHALL | CD | SHALL CNE | ValueSet CID 244 "Laterality" | |
| | > | participation | 0..1 | COND | | | | |
| | >@ | @typecode | 1..1 | SHALL | CS | SHALL | LOC | |
| | >> | participantRole | 1..1 | SHALL | | | | |
| | >>@ | classCode | 1..1 | SHALL | CS | SHALL | SDLOC | |
| | >>> | scopingEntity | 1..1 | SHALL | | | | |
| Provider Organization | >>>> | desc | 1..1 | SHALL | ST | | | |

10.4.1 id

procedure/id does not correspond to any DICOM UID, but is an arbitrary identifier for this entry.

10.4.2 code

When invoked from the (current) 9.3 Imaging Procedure Description, procedure/code SHALL be identical to documentationOf/serviceEvent/code in the CDA header.

10.4.3 text/reference and Related Narrative Block Markup

The Procedure entry SHOULD include a text/reference element, whose value attribute SHALL begin with a '#' and SHALL point to its corresponding narrative in the parent section (using the approach defined in CDA Release 2, section 4.3.5.1). See Section 9.1.1.1.

10.4.4 methodCode - Modality

When invoked from the (current) 9.3 Imaging Procedure Description, procedure/methodCode used for modality SHALL be identical to documentationOf/serviceEvent/code/translation used for modality in the CDA header (see Section 8.2.4.1).

10.4.5 methodCode - Other Parameters

methodCode may be used to encode study type, contrast use, challenge, views, positioning (CID 91 "Functional Condition Present During Acquisition", CID 92 "Joint Position During Acquisition", CID 93 "Joint Positioning Method", CID 94 "Physical Force Applied During Acquisition"), etc.

10.4.6 targetSiteCode and Laterality

procedure/targetSiteCode may be used to encode the specific anatomic focus, and is not necessarily identical to documentationOf/serviceEvent/code/translation used for anatomic region in the CDA header. This may be derived from *Body Part Examined (0018,0015)*, as mapped to SNOMED codes in Annex L "Correspondence of Anatomic Region Codes and Body Part Examined Defined Terms" in PS3.16, or from *Anatomic Region Sequence (0008,2218)*.

COND: The qualifier element for laterality SHALL be present if the targetSiteCode represents a paired body part and laterality is not pre-coordinated in the targetSiteCode.

10.4.7 participation - Location

COND: If this template is invoked from the Comparison Study section, procedure/participation MAY be used to identify the location (provider organization) at which the Comparison Study was performed.

Example 10.4-1. Procedure Technique template example

```
<procedure moodCode="EVN" classCode="PROC">
  <templateId root="1.2.840.10008.9.14"/>
  <id root="1.2.840.6544.33.9100653988998717.997527582345600170"/>
  <code code="RPID465"
    displayName="MR NECK ANGIOGRAPHY"
    codeSystem="2.16.840.1.113883.6.256"
    codeSystemName="RadLex"/>
  <text><reference value="#proc"/></text>
  <effectiveTime value="20140913222400"/>
  <methodCode code="MR"
    displayName="Magnetic Resonance"
    codeSystem="1.2.840.10008.2.16.4" codeSystemName="DCM"/>
  <targetSiteCode code="45048000"
    codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
    displayName="Neck (structure)">
  </targetSiteCode>
</procedure>
```

10.5 Quantity Measurement

| | |
|-------------------------|--|
| Template ID | 2.16.840.1.113883.10.20.6.2.14 |
| Name | Quantity Measurement |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | A Quantity Measurement records quantitative measurements such as linear, area, volume, and numeric measurements. If based on image data, a reference to the image may be present. |
| Classification | CDA Entry Level |
| Relationships | |
| Context | parent node |
| Open/Closed | open |
| Revision History | DICOM-20150324: Initial publication, derived from template originally published in DIR r1-2009, revised in Consolidated CDA r1-2011 as 2.16.840.1.113883.10.20.6.2.14. This derivation includes Units of Measure specified with DICOM value set for UCUM (CID 82 "Units of Measurement"), equivalent to C-CDA specified value set (UCUM Units of Measure (case sensitive) 2.16.840.1.113883.11.12839); addition of optional interpretationCode and actionable priority |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------|------------|-------------------|------|----------------|--------------------|--------------|--|---------------------|
| Quantity Measurement[*] | | observation | 1..1 | SHALL | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | OBS | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 2.16.840.1.113883.10.20.6.2.14 | |
| | > | id | 1..1 | SHALL | II | | | |
| Measurement Name | > | code | 1..1 | SHALL | CD | | ConceptDomain ObservationType | |
| | > | text | 0..1 | SHOULD | | | | |
| Ref | >> | reference | 1..1 | SHALL | URL (XML IDREF) | | # contentRef | |
| | > | statusCode | 1..1 | SHALL | CS | SHALL | COMPLETED | |
| Time | > | effectiveTime | 0..1 | SHOULD | TS | | | |
| | > | value | 1..1 | SHALL | | | | |
| | >@ | @xsi:type | 1..1 | SHALL | ST | SHALL | PQ | |
| Measurement Value | >@ | @value | 1..1 | SHALL | REAL | | | |
| Measurement Units | >@ | @unit | 1..1 | SHALL | CS | SHALL CNE | ValueSet CID 82 "Units of Measurement" | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-------------------------|------------|---------------------|------|----------------|-----------|------------|--|--|
| Interpretation Code | > | interpretation Code | 0..1 | MAY | CE | SHALL CNE | ValueSet ObservationInterpretation Value Set 2.16.840.1.113883.11.78 | |
| ActionablePriority | >> | translation | 1..1 | MAY | CD | MAY CWE | ValueSet CID 7035 "Actionable Finding Classification" [See 10.1.3 interpretationCode and translation For Actionable Findings] | |
| TargetSite | > | targetSite Code | 1..1 | COND | CD | | ConceptDomain ObservationSite | |
| | >> | qualifier | 0..1 | COND | | | | |
| | >>> | name | 1..1 | SHALL | CD | SHALL | (272741003, SNOMED CT, "laterality") | |
| Laterality | >>> | value | 1..1 | SHALL | CD | SHALL CNE | ValueSet CID 244 "Laterality" | |
| | >> | qualifier | 0..1 | COND | | | | |
| | >>> | name | 1..1 | SHALL | CD | SHALL | (106233006, SNOMED CT, "Topographical modifier") | |
| TopoModifier | >>> | value | 1..1 | SHALL | CD | SHALL CNE | ValueSet CID 2 "Anatomic Modifier" | |
| Method | > | methodCode | 0..1 | MAY | CD | | ConceptDomain ObservationMethod | |
| | > | entry Relationship | 0..* | MAY | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | SPRT | |
| SOPInstance[*] | >> | observation | 1..1 | SHALL | | | | 10.8 SOP Instance Observation 1.2.840.10008.9.18 |
| | > | entry Relationship | 0..* | MAY | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | SPRT | |
| Quantity Measurement[*] | > | observation | 1..1 | SHALL | | | | 10.5 Quantity Measurement 2.16.840.1.113883.10.20.6.2.14 |

10.5.1 text/reference and Related Narrative Block Markup

The Observation entry SHOULD include a text/reference element, whose **value** attribute (not to be confused with the **value** element of the Observation class) SHALL begin with a '#' and SHALL point to its corresponding narrative in the parent section (using the approach defined in CDA Release 2, section 4.3.5.1). See Section 9.1.1.1.

10.5.2 interpretationCode and Translation For Actionable Findings

When a measurement is out of normal range, it may be flagged using the interpretationCode. Very abnormal values, often denoted as exceeding "panic limits", or as "actionable" or "critical findings", may have values such as (LL, ObservationInterpretation, "low alert"), (HH, ObservationInterpretation, "high alert"), or (AA, ObservationInterpretation, "abnormal alert").

The translation element of the interpretationCode may be used to provide a further classification as defined in a regionally- or professionally-specified value set. This template identifies an optional value set for the ACR Actionable Finding categories 1, 2, and 3, as defined by: Larson PA, et al. J Am Coll Radiol 2014; published online. DOI 10.1016/j.jacr.2013.12.016.

The narrative text associated with the actionable finding SHOULD be highlighted using styleCode Bold. See Section 9.1.1.1.

Actionable findings that require a specific follow-up action or procedure SHOULD be referenced from a recommendation in the 9.8.11 Recommendation Section.

Communication of actionable findings SHOULD be documented in the 9.8.10 Communication of Actionable Findings Section.

10.5.3 targetSiteCode

Each observation needs to fully specify its site/location.

COND: If the observation site is not pre-coordinated in the observation/code, it SHALL be specified in the observation/targetSiteCode.

COND: The qualifier element for laterality SHALL be present if the targetSiteCode represents a paired body part and laterality is not pre-coordinated in the targetSiteCode.

COND: The qualifier element for topographical modifier SHALL be present if the targetSiteCode does not fully specify the observation location in sufficient detail.

Note

Inclusion of a site name in a labeled subsection title (see Section 9.8.9) does not imply a finding site for observations within that subsection. The title is not semantically part of the post-coordination, and target sites must be explicitly identified.

See Example 10.5-2 "Quantity measurement observation example 2", an example of a measurement using a topographical modifier qualifier.

Example 10.5-1. Quantity measurement observation example 1

```
<text> ...
  <content ID="Q21" styleCode="Bold">Calcium score (Agatston) : 817 [HIGH - ACR Cat3]</content>
  ...
</text>
<entry>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.14"/>
    <id root="1.2.840.10213.2.62.7044234.11652014"/>
    <code code="112058" codeSystem="1.2.840.10008.2.16.4"
      codeSystemName="DCM" displayName="Calcium score" />
    <text><reference value="#Q21"/></text>
    <statusCode code="COMPLETED"/>
    <effectiveTime value="20140913223912"/>
    <value xsi:type="PQ" unit="[arb'U]" value="817" />
    <interpretationCode code="HH" codeSystem="2.16.840.1.113883.5.83"
      codeSystemName="ObservationInterpretation" displayName="High alert">
      <translation code="RID49482" codeSystem="2.16.840.1.113883.6.256"
        codeSystemName="RADLEX" displayName="ACR Category 3 Actionable Finding" />
    </interpretationCode>
    <methodCode code="112055" codeSystem="1.2.840.10008.2.16.4">
```



```

    codeSystemName="DCM" displayName="Agatston" />
    <!-- entryRelationships to SOP Instance Observations may go here -->
  </observation>
</entry>

```

Example 10.5-2. Quantity measurement observation example 2

```

<section>
  <title>Left femoral artery</title>
  <text>
    ...
    <content ID="M10">Distal lumen stenosis: 75%</content>
    ...
  </text>
  <entry>
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.6.2.14"/>
      <id root="1.2.840.10213.2.62.7044234.988810005"/>
      <code code="408714007" codeSystem="2.16.840.1.113883.6.96"
        codeSystemName="SNOMED CT"
        displayName="Vessel lumen diameter reduction" />
      <text><reference value="#M10"/></text>
      <statusCode code="COMPLETED"/>
      <effectiveTime value="20140913223912"/>
      <value xsi:type="PQ" unit="%" value="75" />
      <targetSiteCode code="113270003"
        codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
        displayName="Left femoral artery">
        <qualifier>
          <name code="106233006" codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT" displayName="Topographical modifier" />
          <value code="46053002" codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT" displayName="Distal" />
        </qualifier>
      </targetSiteCode>
    </observation>
  </entry>
</section>

```

10.6 Study Act

| | |
|-----------------------|--------------------|
| Template ID | 1.2.840.10008.9.16 |
| Name | Study Act |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |

| | |
|-------------------------|---|
| Description | A Study Act contains the DICOM study information that defines the characteristics of an imaging study performed on a patient. An imaging study is a collection of one or more series of medical images, presentation states, SR documents, overlays, and/or curves that are logically related for the purpose of diagnosing a patient. Each study is associated with exactly one patient. A study may include composite instances that are created by a single modality, multiple modalities, or by multiple devices of the same modality. The study information is modality-independent. |
| Classification | CDA Entry Level |
| Relationships | Included in 9.8.7 DICOM Object Catalog and 9.4 Comparison Study |
| Context | parent node |
| Open/Closed | Open |
| Revision History | DICOM-20150324: Initial publication, derived from template originally published in DIR r1-2009, revised in Consolidated CDA r1-2011 as 2.16.840.1.113883.10.20.6.2.6. This derivation makes Series conditional (required for Object Catalog) to support use in Comparison Study reference, and uses DICOM-20150324 Series Act subsidiary template. |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------|------------|-------------------|------|----------------|-----------|------------|---|---------------------------------------|
| Study[*] | | act | 1..1 | SHALL | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | ACT | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.16 | |
| | > | id | 1..1 | SHALL | II | | | |
| StudyUID | >@ | @root | 1..1 | SHALL | UID | | <i>Study Instance UID (0020,000D)</i> | |
| | >@ | @extension | 0..0 | SHALL NOT | | | | |
| | > | code | 1..1 | SHALL | CD | SHALL | (113014, DCM, "Study") | |
| Description | > | text | 0..1 | MAY | ED | | | |
| Time | > | effectiveTime | 0..1 | SHOULD | TS | | <i>Study Date (0008,0020) + Study Time (0008,0030) + Timezone Offset From UTC (0008,0201)</i> | |
| | > | entryRelationship | 1..* | COND | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | COMP | |
| Series[*] | >> | act | | | | | | 10.7 Series Act 1.2.840.10008.9.17 |

10.6.1 entryRelationship/act - Series

COND: If this template is invoked by the 9.8.7 DICOM Object Catalog, the entryRelationship to the Series act SHALL be present, otherwise it MAY be present.

Example 10.6-1. Study act example

```

<act classCode="ACT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.6.2.6"/>
  <id root="1.2.840.113619.2.62.994044785528.114289542805"/>
  <code code="113014" codeSystem="1.2.840.10008.2.16.4"
    codeSystemName="DCM" displayName="Study"/>
  <effectiveTime value="20060823223232"/>
  <!-- **** Series ****-->
  <entryRelationship typeCode="COMP">
    <act classCode="ACT" moodCode="EVN">
      ...
    </act>
  </entryRelationship>
</act>

```

10.7 Series Act

| | |
|-------------------------|---|
| Template ID | 1.2.840.10008.9.17 |
| Name | Series Act |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | A Series Act contains the DICOM series information for referenced DICOM composite objects. The series information defines the attributes that are used to group composite instances into distinct logical sets. Each series is associated with exactly one study. Series Act clinical statements are only instantiated in the 9.8.7 DICOM Object Catalog section inside a 10.6 Study Act. |
| Classification | CDA Entry Level |
| Relationships | Included in 10.6 Study Act |
| Context | parent node |
| Open/Closed | open |
| Revision History | DICOM-20150324: Initial publication, derived from template originally published in DIR r1-2009, revised in Consolidated CDA r1-2011 as 2.16.840.1.113883.10.20.22.4.63. This derivation uses DICOM-20150324 SOP Instance subsidiary template. |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|------------------|------------|-------------------|------|----------------|-----------|------------|--|---------------------|
| Series[*] | | act | 1..1 | SHALL | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | ACT | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.17 | |
| | > | id | 1..1 | SHALL | | | | |
| SeriesUID | >@ | @root | 1..1 | SHALL | UID | | <i>Series Instance UID (0020,000E)</i> | |
| | >@ | @extension | 0..0 | SHALL NOT | | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|-----------------------|------------|--------------------|------|----------------|-----------|------------|---|---|
| | > | code | 1..1 | SHALL | CD | SHALL | (113015, DCM, "Series") | |
| | >> | qualifier | 1..1 | SHALL | | | | |
| | >>> | name | 1..1 | SHALL | CD | SHALL | (121139, DCM, "Modality") | |
| Modality | >>> | value | 1..1 | SHALL | CD | | <i>Modality (0008,0060)</i> | |
| Description | > | text | 0..1 | MAY | ED | | | |
| Time | > | effectiveTime | 0..1 | SHOULD | TS | | <i>Series Date (0008,0021) + Series Time (0008,0031) + Timezone Offset From UTC (0008,0201)</i> | |
| | > | entry Relationship | 1..* | SHALL | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | COMP | |
| <i>SOPInstance[*]</i> | >> | <i>observation</i> | 1..1 | | | | | 10.8 SOP Instance Observation 1.2.840.10008.9.18 |

Example 10.7-1. Series act example

```

<act classCode="ACT" moodCode="EVN">
  <templateId root="1.2.840.10008.9.17"/>
  <id root="1.2.840.113619.2.62.994044785528.20060823223142485051"/>
  <code code="113015" codeSystem="1.2.840.10008.2.16.4"
    codeSystemName="DCM" displayName="Series">
    <qualifier>
      <name code="121139" codeSystem="1.2.840.10008.2.16.4"
        codeSystemName="DCM"
        displayName="Modality"/>
      <value code="CR" codeSystem="1.2.840.10008.2.16.4"
        codeSystemName="DCM"
        displayName="Computed Radiography"/>
    </qualifier>
  </code>
  <!-- **** SOP Instance UID ** -->
  <entryRelationship typeCode="COMP">
    <observation classCode="DGIMG" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.6.2.8"/>
      ...
    </observation>
  </entryRelationship>
</act>

```

10.8 SOP Instance Observation

| | |
|-------------|--------------------|
| Template ID | 1.2.840.10008.9.18 |
|-------------|--------------------|

| | |
|-------------------------|---|
| Name | SOP Instance Observation |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |
| Description | A SOP Instance Observation contains the DICOM Service Object Pair (SOP) Instance information for referenced DICOM composite objects. The SOP Instance act class is used to reference both image and non-image DICOM instances. The text attribute contains the DICOM WADO reference. |
| Classification | CDA Entry Level |
| Relationships | |
| Context | parent node |
| Open/Closed | open |
| Revision History | DICOM-20150324: Initial publication, derived from template originally published in DIR r1-2009, revised in Consolidated CDA r1-2011 as 2.16.840.1.113883.10.20.6.2.8 This derivation includes Purpose of Reference value set specified with DICOM CID 7003; directly incorporates descendant templates Purpose of Reference Observation, Referenced Frames, and Boundary Observation |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|----------------|------------|--------------------|------|----------------|-----------|------------|---|---|
| SOPInstance[*] | | observation | 1..1 | SHALL | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | DGIMG | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.18 | |
| SOPInstanceUID | > | id | 1..* | SHALL | II | | <i>SOP Instance UID (0008,0018)</i> | |
| | > | code | 1..1 | SHALL | CD | | | |
| SOPClassUID | >@ | @code | 1..1 | SHALL | ST | | <i>SOP Class UID (0008,0016)</i> | |
| | >@ | @codeSystem | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.2.6.1 | |
| | > | text | 0..1 | SHOULD | ED | | | |
| | >@ | @mediaType | 1..1 | SHALL | ST | SHALL | application/dicom | |
| WADOReference | >> | reference | 1..1 | SHALL | URL | | | |
| | > | effectiveTime | 0..1 | SHOULD | TS | | <i>Instance Creation Date (0008,0012) + Instance Creation Time (0008,0013) + Timezone Offset From UTC (0008,0201)</i> | |
| | > | entry Relationship | 0..* | COND | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | SUBJ | |
| SOPInstance[*] | >> | observation | 1..1 | SHALL | | | | 10.8 SOP Instance Observation 1.2.840.10008.9.18 |
| | > | entry Relationship | 0..1 | COND | | | | |

| Business Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------------|------------|--------------------|------|----------------|---------------|-------------------------|--|---------------------|
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | RSON | |
| | >> | observation | 1..1 | SHALL | | | | |
| | >>@ | @classCode | 1..1 | SHALL | CS | SHALL | OBS | |
| | >>@ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | >>> | code | 1..1 | SHALL | CD | SHALL | (ASSERTION, ActCode [2.16.840.1.113883.5.4], "Assertion") | |
| PurposeOf Reference | >>> | value | 1..1 | SHALL | CD | SHALL CWE DYNAMIC | ValueSet CID 7003 "Diagnostic Imaging Report Purposes of Reference" | |
| | > | entry Relationship | 0..1 | COND | | | | |
| | >@ | @typeCode | 1..1 | SHALL | CS | SHALL | COMP | |
| | >> | observation | 1..1 | SHALL | | | | |
| | >>@ | @classCode | 1..1 | SHALL | CS | SHALL | ROIBND | |
| | >>@ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | >> | code | 1..1 | SHALL | CD | SHALL | (121190, DCM, "Referenced Frames") | |
| | >> | entry Relationship | 1..1 | SHALL | | | | |
| | >>@ | @typeCode | 1..1 | SHALL | CS | SHALL | COMP | |
| | >>> | observation | 1..1 | SHALL | | | | |
| | >>>@ | @classCode | 1..1 | SHALL | CS | SHALL | OBS | |
| | >>>@ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | >>> | code | 1..1 | SHALL | CD | SHALL | (113036, DCM, "Frames for Display") | |
| Referenced Frames | >>> | value | 1..1 | SHALL | LIST <INT> | | | |

10.8.1 entryRelationship

COND: entryRelationship SHALL NOT be present in a 10.8 SOP Instance Observation included within a 9.8.7 DICOM Object Catalog section, and MAY be present otherwise.

10.8.1.1 entryRelationship/@typeCode=SUBJ (SOP Instance)

This template recursively invokes itself to allow a Presentation State SOP Instance reference to identify the target Image SOP Instances, or for a derived Image to reference its source Image, or similar linkages between instances.

Note

This is generally not required, as the DICOM SOP Instance itself identifies relationships to the relevant other SOP Instances.

10.8.1.2 entryRelationship/@typeCode=RSON (Purpose of Reference)

A Purpose of Reference Observation describes the purpose of the DICOM composite object reference. Appropriate codes, such as externally defined DICOM codes, may be used to specify the semantics of the purpose of reference. When this observation is absent, it implies that the reason for the reference is unknown.

Note

In Consolidated CDA r1.1, this was defined using a separate "Purpose of Reference Observation" template, which is included directly in this template specification.

10.8.1.3 entryRelationship/@typeCode=COMP (Referenced Frames)

A Referenced Frames Observation contains a list of integer values for the referenced frames of a DICOM multi-frame image SOP instance. It identifies the frame numbers within the referenced SOP instance to which the reference applies. The observation identifies frames using the same convention as DICOM, with the first frame in the referenced object being Frame 1. A Referenced Frames Observation must be used if a referenced DICOM SOP instance is a multi-frame image and the reference does not apply to all frames.

Note

In Consolidated CDA r1.1, this was defined using separate "Referenced Frames Observation" and "Boundary Observation" templates, which are included directly in this template specification.

Example 10.8-1. SOP instance observation example with purpose of reference

```
<observation classCode="DGIMG" moodCode="EVN">
  <templateId root="1.2.840.10008.9.18"/>
  <id root="1.2.840.113619.2.62.994044785528.20060823.200608232232322.3"/>
  <code code="1.2.840.10008.5.1.4.1.1.1"
    codeSystem="1.2.840.10008.2.6.1" codeSystemName="DCMUID"
    displayName="Computed Radiography Image"/>
</code>
<text mediaType="application/dicom">
  <reference value="http://www.example.org/wado?requestType=WADO
    &studyUID=1.2.840.113619.2.62.994044785528.114289542805
    &seriesUID=1.2.840.113619.2.62.994044785528.20060823223142485051
    &objectUID=1.2.840.113619.2.62.994044785528.20060823.200608232232322.3
    &contentType=application/dicom"/>
  <!--reference to image 1 (PA) -->
</text>
<effectiveTime value="20060823223232"/>
<entryRelationship typeCode="RSON">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.9"/>
    <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
    <value xsi:type="CD" code="121112"
      codeSystem="1.2.840.10008.2.16.4"
      codeSystemName="DCM"
      displayName="Source of Measurement"/>
  </observation>
</entryRelationship>
</observation>
```

10.9 Image Quality

| | |
|-----------------------|--------------------|
| Template ID | 1.2.840.10008.9.15 |
| Name | Image Quality |
| Effective Date | 2015/03/24 |
| Version Label | DICOM-20150324 |
| Status | Active |

| | |
|-------------------------|---|
| Description | Provides a quality assessment for the image set identified by the invoking section. By default unless otherwise identified, applies to the image set interpreted by the document (typically a Study). If the quality rating applies to only a subset of the Study (e.g., a Series, or a specific Image), that subset shall be identified in the invoking section. |
| Classification | CDA Entry Level |
| Relationships | Included in 9.3 Imaging Procedure Description |
| Context | parent node |
| Open/Closed | open |
| Revision History | DICOM-20150324: Initial version Derived from Coded Observation |

| Name | Nest Level | Element/Attribute | Card | Elem/Attr Conf | Data Type | Value Conf | Value | Subsidiary Template |
|---------------|------------|-------------------|------|----------------|-----------------|---------------|--|---------------------|
| Image Quality | | observation | 1..1 | SHALL | | | | |
| | @ | @classCode | 1..1 | SHALL | CS | SHALL | OBS | |
| | @ | @moodCode | 1..1 | SHALL | CS | SHALL | EVN | |
| | > | templateId | 1..1 | SHALL | II | | | |
| | >@ | @root | 1..1 | SHALL | UID | SHALL | 1.2.840.10008.9.15 | |
| | > | id | 1..1 | SHALL | II | | | |
| | > | code | 1..1 | SHALL | CD | | (111050, DCM, "Image Quality Assessment") | |
| | > | text | 0..1 | SHOULD | | | | |
| Ref | >> | reference | 1..1 | SHALL | URL (XML IDREF) | | # contentRef | |
| | > | statusCode | 1..1 | SHALL | CS | SHALL | COMPLETED | |
| Rating | > | value | 1..1 | SHALL | CD | SHOULD CWE | ValueSet CID 7036 "Image Quality Assessment" | |
| | >@ | @xsi:type | 1..1 | SHALL | ST | SHALL | CD | |

10.9.1 text/reference and Related Narrative Block Markup

The Observation entry SHOULD include a text/reference element, whose value attribute (not to be confused with the value element of the Observation class) SHALL begin with a '#' and SHALL point to its corresponding narrative in the parent section (using the approach defined in CDA Release 2, section 4.3.5.1). See Section 9.1.1.1.

Example 10.9-1. Image Quality example

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="1.2.840.10008.9.15"/>
  <id root="1.2.840.113619.2.62.994044785528.20060823.200608232232322.3"/>
  <code code="111050" codeSystem="1.2.840.10008.2.6.1"
    codeSystemName="DCM"
    displayName="Image Quality Assessment"/>
  <text>
    <reference value="#Q9"/>
  </text>
  <statusCode code="completed"/>
  <value xsi:type="CD" code="RID12">
```



```
codeSystem="2.16.840.1.113883.6.256"  
codeSystemName="RADLEX"  
displayName="Diagnostic quality"/>  
</observation>
```


A SR Diagnostic Imaging Report Transformation Guide

Retired. See PS3.20-2015.

Note

This Annex provided a transformation of SR documents based on TID 2000 Basic Diagnostic Imaging Report to HL7 CDA Release 2 Imaging Reports based on the HL7 Diagnostic Imaging Reports (DIR) Release 1.0 Informative specification Template 2.16.840.1.113883.10.20.6.

B SR Diagnostic Imaging Report Transformation Guide

Retired. See PS3.20-2015.

Note

This Annex provided a transformation of SR documents based on TID 2006 Imaging Report With Conditional Radiation Exposure and Protection Information to HL7 CDA Release 2 Imaging Reports based on the HL7 Diagnostic Imaging Reports (DIR) Release 1.0 Informative specification Template 2.16.840.1.113883.10.20.6.

C SR to CDA Imaging Report Transformation Guide

Constrained DICOM SR documents based on Imaging Report templates can be mapped to HL7 CDA Release 2 Imaging Reports based on Template 1.2.840.10008.9.1, as specified in Section 7.1. The SR report templates to which this transformation applies include:

- TID 2000 Basic Diagnostic Imaging Report
- TID 2005 Transcribed Diagnostic Imaging Report
- TID 2006 Imaging Report With Conditional Radiation Exposure and Protection Information

SR instances based on other templates may also be able to be mapped using the transformations in this Annex.

SR documents can be thought of as consisting of a document header and a document body, corresponding to a CDA document header and body. The header includes the modules related to the Patient, Study, Series, and Equipment Information Entities, plus the SR Document General Module, as specified in PS3.3. The SR Document Content Module contains the content tree (structured content) of the document body. Note, however, that DICOM SR considers the root content item, including the coded report title, and some context-setting content items as part of the document body content tree, but these constitute part of the CDA header. See Figure C-1.

C.1 Constraints

This Annex defines the transformation of an Enhanced SR SOP Instance to a CDA instance. The following constraints apply to such SOP Instances:

- Observation Context: The mapping does not support changing the observation context for the report as a whole from its default context, as specified in the Patient, Study, and Document Information Entities (see PS3.3 Section C.17.5 “Observation Context Encoding”)

Note

TID 2000, TID 2005 and TID 2006 specify inclusion of TID 1001 Observation Context as Mandatory, but TID 1001 has no content if all aspects of context are inherited, as under this constraint.

- Subject Context: The mapping does not support the subject of any of the report sections to be a specimen (TID 1009), a device (TID 1010), or a non-human subject. Only a fetus subject context is supported for a Findings section.
- Procedure Context: The mapping allows identification of a different procedure than the procedure identified in the SR Study IE only as context for a Prior Procedure Descriptions section.
- De-identified Documents: There is no CDA implementation guidance from HL7 for de-identified documents, other than general rules for using the MSK null flavor (see Section 5.3.2). There is no CDA capability equivalent to the Encrypted Attributes Sequence (see PS3.3 Section C.12.1.1.4.1 “Encrypted Attributes Sequence”) for carrying encrypted re-identification data.
- Patient Study Module: Medical or clinical characteristics of the patient specified in the Patient Study Module are not mapped (see PS3.3 Section C.17.5 “Observation Context Encoding”)
- Clinical Trials: Template 1.2.840.10008.9.1 does not define attributes for clinical trials equivalent to those of the Patient, Study, and Series IEs (Clinical Trial Subject Module, Clinical Trial Study Module, Clinical Trial Series Module).
- Spatial Coordinates: The mapping does not support SCOORD observations. As CDA documents are principally for human reading, detailed ROI data is presumed to reside in the DICOM SOP Instances of the study, or in images ready for rendering with a Presentation State, not in the CDA report. Template 1.2.840.10008.9.1 does not support the CDA Region of Interest Overlay entry class (see Section 9.1.2.4).

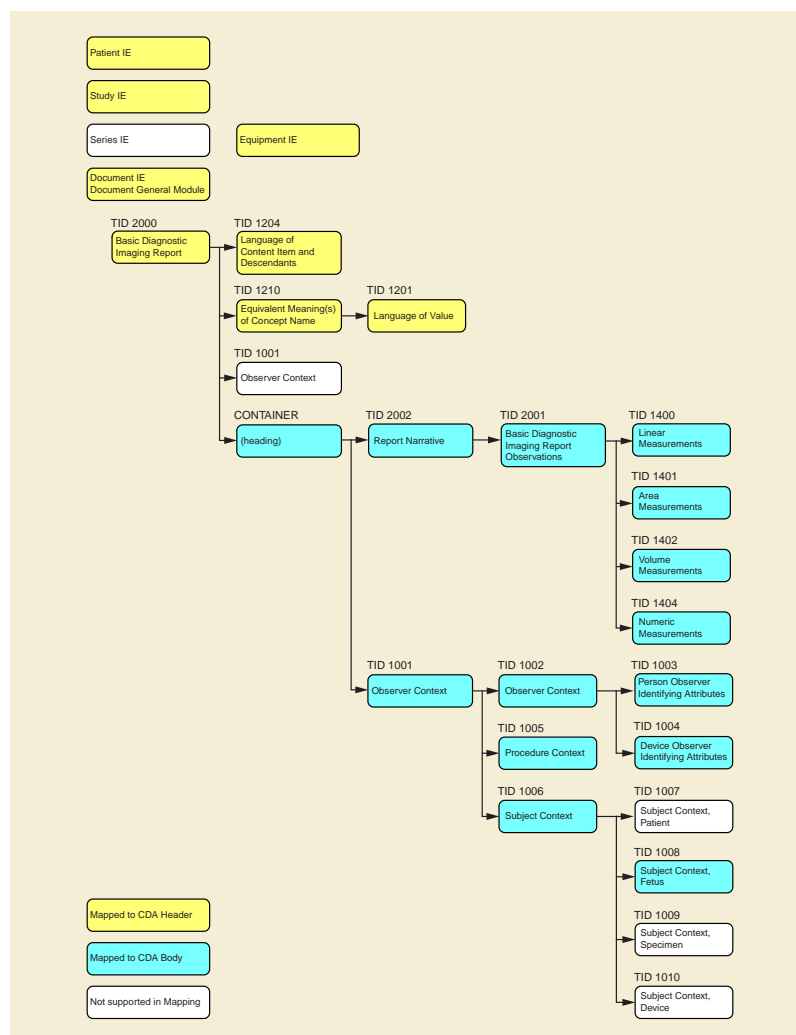


Figure C-1. TID 2000 Structure Summarized from PS3.16, and mapping to CDA

C.2 Conventions

Literar values to be encoded in CDA elements are represented in the mapping tables in normal font, as a string, or as a coded value triplet:

"NI"

(codeValue, codingScheme, codeMeaning)

Conventions for mapping from DICOM attributes in the transformed SR are described in Section 5.2.8.

Data mapped from an SR Content Item is identified by the Concept Name of the Content Item, represented in the mapping tables as a triplet in *italic font*:

(codeValue, codingScheme, codeMeaning)

Data mapped from a specific Attribute in an SR Content Item uses the triplet to identify the Content Item, with the > character and the specific attribute name and tag:

(codeValue, codingScheme, codeMeaning) > Attribute Name (gggg,eeee)

Additional notes are within square brackets:

[Note]

Mandatory CDA elements for which there is no corresponding source data in the SR SOP Instance may be coded with a nullFlavor attribute (see Section 5.3.2).

C.3 Header Transformation

For transformation of the SR content into the CDA header, the target elements of the CDA instance are listed in Table C.3-1 by their Business Names, together with the recommended source in an SR instance. This allows the transforming application to "pull" the relevant information from the SR to populate the CDA header.

Table C.3-1. CDA Header content from SR

| CDA Business Name | DICOM SR |
|--|---|
| ImagingReport: DocType | <i>Concept Name Code Sequence (0040,A043)</i> [of the root content item] |
| ImagingReport: ContentTemplate | |
| ImagingReport: DocumentID | |
| ImagingReport: Title | <i>(121050, DCM, "Equivalent Meaning of Concept Name") > Concept Code Sequence (0040,A168) > Code Meaning (0008,0104)</i> if present; otherwise <i>Concept Name Code Sequence (0040,A043) > Code Meaning (0008,0104)</i> [of the root content item]. |
| ImagingReport: CreationTime | <i>Content Date (0008,0023) + Content Time (0008,0033) + Timezone Offset From UTC (0008,0201)</i> |
| ImagingReport: Confidentiality | |
| ImagingReport: LanguageCode | <i>(121049, DCM, "Language of Content Item and Descendants")</i> |
| ImagingReport: SetId | |
| ImagingReport: VersionNumber | |
| ImagingReport: Patient:ID | <i>Patient ID (0010,0020)</i> |
| ImagingReport: Patient:IDIssuer | <i>Issuer of Patient ID Qualifiers Sequence (0010,0024) > Universal Entity ID (0040,0032)</i> |
| ImagingReport: Patient:Addr | <i>Patient's Address (0010,1040)</i> |
| ImagingReport: Patient:Tele | <i>Patient's Telephone Numbers (0010,2154)</i> |
| ImagingReport: Patient:Name | <i>Patient's Name (0010,0010)</i> |
| ImagingReport: Patient:Gender | <i>Patient's Sex (0010,0040)</i> [Map value "O" to nullFlavor UNK] |
| ImagingReport: Patient:BirthTime | <i>Patient's Birth Date (0010,0030) + Patient's Birth Time (0010,0032)</i> |
| ImagingReport: Patient:ProviderOrgName | <i>Issuer of Patient ID (0010,0021)</i> |
| ImagingReport: Patient:ProviderOrgTel | |
| ImagingReport: Patient:ProviderOrgAddr | |
| ImagingReport: SigningTime | <i>Verifying Observer Sequence (0040,A073) > Verification DateTime (0040,A030).</i> |
| ImagingReport: SignerID | <i>Verifying Observer Sequence (0040,A073) > Verifying Observer Identification Code Sequence (0040,A088)</i> [code value as identifier] |
| ImagingReport: SignerAddr | |
| ImagingReport: SignerTel | |
| ImagingReport: SignerName | <i>Verifying Observer Sequence (0040,A073) > Verifying Observer Name (0040,A075)</i> |

| CDA Business Name | DICOM SR |
|--|--|
| ImagingReport: SignatureBlock | |
| ImagingReport: Author:AuthoringTime | <i>Content Date (0008,0023) + Content Time (0008,0033) + Timezone Offset From UTC (0008,0201)</i> |
| ImagingReport: Author:ID | <i>Author Observer Sequence (0040,A078) > Person Identification Code Sequence (0040,1101) [code value as identifier]</i> |
| ImagingReport: Author:Addr | |
| ImagingReport: Author:Tel | |
| ImagingReport: Author:Name | <i>Author Observer Sequence (0040,A078) > Person Name (0040,A123)</i> |
| ImagingReport: Recipient:Addr | |
| ImagingReport: Recipient:Tel | |
| ImagingReport: Recipient:Name | |
| ImagingReport: Recipient:Org | |
| ImagingReport: CustodianOrgID | <i>Custodial Organization Sequence (0040,A07C) > Institution Code Sequence (0008,0082) [code value as identifier]</i> |
| ImagingReport: CustodianOrgName | <i>Custodial Organization Sequence (0040,A07C) > Institution Name (0008,0080)</i> |
| ImagingReport: CustodianOrgAddr | |
| ImagingReport: CustodianOrgTel | |
| ImagingReport: EncounterID | <i>Admission Id (0038,0010)</i> |
| ImagingReport: EncounterIDIssuer | <i>Issuer of Admission ID Sequence (0038;0014) > Universal Entity ID (0040,0032)</i> |
| ImagingReport: EncounterTime | |
| ImagingReport: HealthcareFacilityName | |
| ImagingReport: HealthcareFacilityAddress | <i>Institution Address (0008,0081)</i> |
| ImagingReport:HealthcareProviderOrganizationName | <i>Institution Name (0008,0080)</i> |
| ImagingReport:AttendingPhysicianName | <i>Physician(s) of Record (0008,1048)</i> |
| ImagingReport:OrderPlacerNumber | <i>Referenced Request Sequence (0040,A370) > Placer Order Number/Imaging Service Request (0040,2016)</i> |
| ImagingReport:OrderAssigningAuthority | <i>Referenced Request Sequence (0040,A370) > Order Placer Identifier Sequence (0040,0026) > Universal Entity ID (0040,0032)</i> |
| ImagingReport:AccessionNumber | <i>Accession Number (0008,0050)</i> |
| ImagingReport:AccessionAssigningAuthority | <i>Issuer of Accession Number Sequence (0008,0051) > Universal Entity ID (0040,0032)</i> |
| ImagingReport:OrderedProcedureCode | <i>Referenced Request Sequence (0040,A370) > Requested Procedure Code Sequence (0032,1064)</i> |
| ImagingReport: OrderPriority | |
| ImagingReport:Study:StudyUID | <i>Study Instance UID (0020,000D)</i> |
| ImagingReport:Study:ProcedureCode | <i>Procedure Code Sequence (0008,1032)</i> |
| ImagingReport:Study:Modality | <i>(122142, DCM, "Acquisition Device Type") or (55111-9, LN, "Current Procedure Descriptions") > (122142, DCM, "Acquisition Device Type")</i> |
| ImagingReport:Study:AnatomicRegionCode | <i>(123014, DCM, "Target Region") or (55111-9, LN, "Current Procedure Descriptions") > (123014, DCM, "Target Region")</i> |
| ImagingReport:Study:StudyTime | <i>Study Date (0008,0020) + Study Time (0008,0030) + Timezone Offset From UTC (0008,0201)</i> |
| ImagingReport: Performer:Type | |

| CDA Business Name | DICOM SR |
|--------------------------------------|---|
| ImagingReport: Performer:ID | |
| ImagingReport: Performer:Name | |
| ImagingReport: ReferrerAddr | <i>Referring Physician Identification Sequence (0008,0096) > Person's Address (0040,1102)</i> |
| ImagingReport: ReferrerTel | <i>Referring Physician Identification Sequence (0008,0096) > Person's Telephone Numbers (0040,1103)</i> |
| ImagingReport: ReferrerName | <i>Referring Physician's Name (0008,0090)</i> |
| ImagingReport: TranscriptionistID | <i>Participant Sequence (0040,A07A) > Person Identification Code Sequence (0040,1101) , [where Participation Type (0040,A080) equals "ENT" (Data Enterer); code value as identifier]</i> |
| ImagingReport: TranscriptionistName | <i>Participant Sequence (0040,A07A) Person Name (0040,A123) [where Participation Type (0040,A080) equals "ENT" (Data Enterer)]</i> |
| ImagingReport: TransformedDocumentID | <i>SOP Instance UID (0008,0018)</i> |

ImagingReport:Study:Modality and ImagingReport:Study:AnatomicRegionCode may be mapped from attributes in the root CONTAINER, if present there as in TID 2000, or in the Current Procedure Descriptions section CONTAINER, if present there as in TID 2006.

C.4 Body Transformation

For transformation of the body, this Section maps the SR content items to their target CDA elements. This allows the transforming application to traverse the SR content tree and construct equivalent CDA content.

C.4.1 Section Mapping

SR TID 2000, TID 2005 and TID 2006 specify that imaging report elements are contained in sections, represented as CONTAINERS with concept name codes from CID 7001.

Each CONTAINER immediately subsidiary to the root CONTAINER shall be mapped to the section or subsection as specified in Table C.4-1. Note that some SR document sections are mapped to subsections under CDA Template 1.2.840.10008.9.1.

Table C.4-1. SR Section mapping to CDA

| Coding Scheme Designator | Code Value | Code Meaning | Map to Template Section/Subsection |
|--------------------------|------------|--------------------------------|---|
| LN | 11329-0 | History | 9.2 Clinical Information / 9.8.3 Medical (General) History |
| LN | 55115-0 | Request | 9.2 Clinical Information / 9.8.1 Request |
| LN | 55111-9 | Current Procedure Descriptions | 9.3 Imaging Procedure Description |
| LN | 55114-3 | Prior Procedure Descriptions | 9.4 Comparison Study |
| LN | 18834-2 | Previous Findings | 9.4 Comparison Study |
| LN | 18782-3 | Findings (Study Observation) | 9.5 Findings or 9.5 Findings / 9.8.8 Fetus Findings (see C.4.1.3) |
| LN | 59776-5 | Findings | 9.5 Findings or 9.5 Findings / 9.8.8 Fetus Findings (see C.4.1.3) |
| LN | 19005-8 | Impressions | 9.6 Impression |
| LN | 18783-1 | Recommendations | 9.6 Impression / 9.8.11 Recommendation |
| LN | 55110-1 | Conclusions | 9.6 Impression |
| LN | 55107-7 | Addendum | 9.7 Addendum |
| LN | 18785-6 | Indications for Procedure | 9.2 Clinical Information / 9.8.2 Procedure Indications |
| LN | 55108-5 | Patient Presentation | 9.2 Clinical Information |

| Coding Scheme Designator | Code Value | Code Meaning | Map to Template Section/Subsection |
|--------------------------|------------|---|---|
| LN | 55109-3 | Complications | 9.3 Imaging Procedure Description / 9.8.4 Complications |
| LN | 55112-7 | Summary | 9.6 Impression |
| LN | 55113-5 | Key Images | 9.6 Impression / 9.8.6 Key Images |
| LN | 73569-6 | Radiation Exposure and Protection Information | 9.3 Imaging Procedure Description / 9.8.5 Radiation Exposure and Protection Information |
| LN | 55752-0 | Clinical Information | 9.2 Clinical Information |
| LN | 29549-3 | Medications Administered | 9.3 Imaging Procedure Description / 10.2 Procedural Medication |
| LN | 73568-8 | Communication of Critical Results | 9.6 Impression / 9.8.10 Communication of Actionable Findings |

CDA Template 1.2.840.10008.9.1 requires a minimum of an Imaging Procedure Description section and an Impression section.

The section/code element shall be populated in accordance with the relevant CDA template; note that the code might not be the same as the Concept Name code of the SR section CONTAINER. The title element of each CDA section shall be populated as shown in Table C.4-2.

Table C.4-2. CDA Section mapping from SR

| CDA Business Name | DICOM SR |
|-----------------------------------|---|
| <section>: Title | <i>Concept Name Code Sequence (0040,A043) > Code Meaning (0008,0104)</i> [of the section CONTAINER content item] |
| <section>: Text | [See C.4.2] |
| <section>: CodedObservation[*] | [See C.4.3.1 and C.4.3.2] |
| <section>: QuantityMeasurement[*] | [See C.4.3.4] |
| <section>: SOPInstance[*] | [See C.4.3.3] |

SR allows sections to be qualified by observation context, using TID 1001 and its subsidiary templates. This capability is constrained in this mapping.

C.4.1.1 Section Observer Context

TID 1002 Observer Context allows identification of a human or device author.

Table C.4-3. CDA Section author mapping from SR

| CDA Business Name | DICOM SR |
|-------------------------------|---|
| <section>: AuthorID | If (121005, DCM, "Observer Type") = (121007, DCM, "Device"), then (121012, DCM, "Device Observer UID") ID for human observer not represented in SR; use nullFlavor="UNK" |
| <section>: AuthorName | (121008, DCM, "Person Observer Name") |
| <section>: AuthorOrganization | (121009, DCM, "Person Observer's Organization Name") |
| <section>: AuthorDeviceModel | (121015, DCM, "Device Observer Model Name") |
| <section>: AuthorSoftware | (121013, DCM, "Device Observer Name") |

C.4.1.2 Comparison Study Procedure Context

TID 1005 Procedure Context allows identification of a different procedure than the procedure identified in the SR Study IE as the context for the section observations. In the transformations of this Annex, only an identified comparison procedure is supported as Procedure Context, the SR section being transformed must be either Prior Procedure Descriptions or Previous Findings, and the CDA section shall be in accordance with the Comparison Study section Template 1.2.840.10008.9.4.

SR Instances using TID 2006 have additional attributes of a comparison procedure specified using TID 2007, which is used in the Prior Procedure Descriptions section. The attributes of both TID 1005 and TID 2007 are source data in the Table C.4-4 mapping.

Table C.4-4. Comparison Study mapping from SR

| CDA Business Name | DICOM SR |
|---|--|
| ComparisonStudy: ProcedureTechnique: ProcedureCode | (121023, DCM, "Procedure Code") |
| ComparisonStudy: ProcedureTechnique: EffectiveTime | (111060, DCM, "Study Date") + (111061, DCM, "Study Time") |
| ComparisonStudy: ProcedureTechnique: Modality | (122142, DCM, "Acquisition Device Type") |
| ComparisonStudy: ProcedureTechnique: MethodCode | |
| ComparisonStudy: ProcedureTechnique: TargetSite | (123014, DCM, "Target Region") |
| ComparisonStudy: ProcedureTechnique: Laterality: | |
| ComparisonStudy: ProcedureTechnique: Ref: | |
| ComparisonStudy: ProcedureTechnique: ProviderOrganization | |
| ComparisonStudy: Study[*]: StudyUID | (121018, DCM, "Procedure Study Instance UID") |
| ComparisonStudy: Study[*]: Description | (121065, DCM, "Procedure Description") , if present, or (121023, DCM, "Procedure Code") > Code Meaning (0008,0104) |
| ComparisonStudy: Study[*]: Time | (111060, DCM, "Study Date") + (111061, DCM, "Study Time") |

C.4.1.3 Fetus Subject Context

TID 1006 Subject Context allows identification of a different subject than the patient identified in the SR Patient IE. In the transformations of this Annex, only an identified fetus subject is supported as Subject Context for a Findings section. An SR section with a fetus subject context shall be mapped to a CDA section shall be in accordance with the Fetus Findings subsection Template 1.2.840.10008.9.9. This section is subsidiary to the top level Findings section; multiple SR fetus findings sections may be mapped to separate CDA Fetus Findings subsections.

Table C.4-5. CDA Fetus subject mapping from SR

| CDA Business Name | DICOM SR |
|-------------------------------------|--|
| Findings: FetusFindings[*]: FetusID | (121030, DCM, "Subject ID") or (11951-1, LN, "Fetus ID") |

C.4.2 Section/text

DICOM TID 2002 Report Narrative specifies that sections contain imaging report elements of type CODE, TEXT, IMAGE, or NUM.

Section/text in the CDA document contains the narrative text (attested content) of the document. Section/text shall be generated from all the Content Items subsidiary to a section CONTAINER of the SR document, such that the full meaning is conveyed in an unambiguous manner in the narrative block.

The narrative rendered from each Content Item shall be encapsulated in a <content> element of the narrative block, allowing the associated entry to reference it.

C.4.3 Content Item Mapping

Each Content Item immediately subsidiary to a section CONTAINER shall be mapped to the corresponding entry level template, and shall be included subsidiary to the associated CDA section or subsection. This is in addition to its rendering in the section/text narrative block.

Coded concepts that are encoded in the SR using with the Coding Scheme Designator "SRT" shall be mapped to the equivalent SNOMED CT code. Mappings for value sets invoked in both SR and CDA are provided in PS3.16.

C.4.3.1 Coded Observations

SR CODE Content Items shall be mapped to Coded Observation entries.

Table C.4-6. CDA Coded Observation mapping from SR CODE

| CDA Business Name | DICOM SR |
|--|---|
| CodedObservation[*]: ObsName | <i>Concept Name Code Sequence (0040,A043)</i> |
| CodedObservation[*]: ObsValue | <i>Concept Code Sequence (0040,A168)</i> |
| CodedObservation[*]: Time | <i>Observation DateTime (0040,A032)</i> |
| CodedObservation[*]: InterpretationCode | |
| CodedObservation[*]: ActionableFindingCode | |
| CodedObservation[*]: TargetSite | <i>(G-C0E3, SRT, "Finding Site")</i> |
| CodedObservation[*]: Laterality | <i>(G-C0E3, SRT, "Finding Site") > (G-C171, SRT, "Laterality")</i> |
| CodedObservation[*]: TopoModifier | |
| CodedObservation[*]: Method | |
| CodedObservation[*]: SOPInstance | [See C.4.3.3] |
| CodedObservation[*]: QuantityMeasurement | [See C.4.3.4] |
| CodedObservation[*]: CodedObservation | |

The CODE observations in TID 2002 do not specifically include finding site, laterality, and topographical modifiers, but these modifiers are not forbidden in the template, and may be present in a SR SOP Instance being transformed to CDA.

C.4.3.2 Text Observations

SR TEXT Content Items are mapped to Coded Observation entries, but the code is a nullFlavor with the text content in originalText.

Table C.4-7. CDA Coded Observation mapping from SR TEXT

| CDA Business Name or XPath | DICOM SR |
|--|---|
| CodedObservation[*]: ObsName | <i>Concept Name Code Sequence (0040,A043)</i> |
| observation/value/@nullFlavor | "NI" |
| observation/value/originalText | <i>Text Value (0040,A160)</i> |
| CodedObservation[*]: Time | <i>Observation DateTime (0040,A032)</i> |
| CodedObservation[*]: InterpretationCode | |
| CodedObservation[*]: ActionableFindingCode | |
| CodedObservation[*]: TargetSite | |
| CodedObservation[*]: Laterality | |
| CodedObservation[*]: TopoModifier | |
| CodedObservation[*]: Method | |

| CDA Business Name or XPath | DICOM SR |
|--|---------------|
| CodedObservation[*]: SOPInstance | [See C.4.3.3] |
| CodedObservation[*]: QuantityMeasurement | [See C.4.3.4] |
| CodedObservation[*]: CodedObservation | |

C.4.3.3 Image Observations

SR IMAGE Content Items shall be mapped to SOP Instance Observation entries.

Table C.4-8. CDA SOP Instance Observation mapping from SR IMAGE

| CDA Business Name | DICOM SR |
|-----------------------------------|---|
| SOPInstance[*]:SOPInstanceUID | <i>Referenced SOP Sequence (0008,1199) > Referenced SOP Instance UID (0008,1155)</i> |
| SOPInstance[*]:SOPClassUID | <i>Referenced SOP Sequence (0008,1199) > Referenced SOP Class UID (0008,1150)</i> |
| SOPInstance[*]:WADOReference | [WADO link constructed from image reference; also used in linkHtml in narrative block] |
| SOPInstance[*]:PurposeOfReference | <i>Concept Name Code Sequence (0040,A043)</i> |
| SOPInstance[*]:ReferencedFrames | <i>Referenced SOP Sequence (0008,1199) > Referenced Frame Number (0008,1160)</i> |

C.4.3.4 Numeric Observations

SR NUM Content Items shall be mapped to Quantity Measurement entries.

Table C.4-9. CDA Quantity Measurement mapping from SR NUM

| CDA Business Name | DICOM SR |
|---|---|
| QuantityMeasurement[*]: MeasurementName | <i>Concept Name Code Sequence (0040,A043)</i> |
| QuantityMeasurement[*]: MeasurementValue | <i>Measured Value Sequence (0040,A300) > Numeric Value (0040,A30A)</i> |
| QuantityMeasurement[*]: MeasurementUnits | <i>Measured Value Sequence (0040,A300) > Measurement Units Code Sequence (0040,08EA) > Code Value (0008,0100)</i> |
| QuantityMeasurement[*]: Time | <i>Observation DateTime (0040,A032)</i> |
| QuantityMeasurement[*]: InterpretationCode | |
| QuantityMeasurement[*]: ActionableFindingCode | |
| QuantityMeasurement[*]: TargetSite | <i>(G-C0E3, SRT, "Finding Site")</i> |
| QuantityMeasurement[*]: Laterality | <i>(G-C0E3, SRT, "Finding Site") > (G-C171, SRT, "Laterality")</i> |
| QuantityMeasurement[*]: Method | <i>(G-C036, SRT, "Measurement Method")</i> |
| QuantityMeasurement[*]: TopoModifier | <i>(G-A1F8, SRT, "Topographical modifier")</i> |
| QuantityMeasurement[*]: SOPInstance | [See C.4.3.3] |
| QuantityMeasurement[*]: QuantityMeasurement | [See C.4.3.4] |

The SR templates invoked for NUM measurements from TID 2000 do not specifically include finding site, laterality, and topographical modifiers, but these modifiers are not forbidden in the template, they are used in many other NUM value templates (e.g., TID 300 Measurement), and may be present in a SR SOP Instance being transformed to CDA.

C.4.3.5 Inferred From Image Observations

SR TID 2001 and TID 2002 allow Content Items to be INFERRED FROM IMAGE observations. The INFERRED FROM relationship is mapped to the entryRelationship with typeCode=SPRT, and the IMAGE observation is mapped to a CDA SOP Instance Observation entry subsidiary to its parent CDA Coded Observation or Quantity Measurement entry. This entryRelationship is shown in the Coded Observation and Quantity Measurement CDA Templates.

C.4.3.6 Inferred From Numeric Observations

SR TID 2001 and TID 2002 allow Content Items to be INFERRED FROM NUM observations. The INFERRED FROM relationship is mapped to the entryRelationship with typeCode=SPRT, and the NUM observation is mapped to CDA Quantity Measurement entry subsidiary to its parent CDA Coded Observation or Quantity Measurement entry. This entryRelationship is shown in the Coded Observation and Quantity Measurement CDA Templates.

C.4.3.7 Inferred From Spatial Coordinates Observations

SR TID 1400, TID 1401, TID 1402, and TID 1404 allow NUM Content Items to be INFERRED FROM SCOORD observations, which are SELECTED FROM IMAGE observations. This Annex does not specify the transformation for SCOORD observations; these would use the CDA Region Of Interest entry, which PS3.20 forbids (see Section 9.1.2.4).

C.4.4 Specific Section Content Mapping

Certain sections in a CDA Imaging Report have specific mappings from the DICOM SR header, or from specialized templates with content for particular uses.

C.4.4.1 Procedure Indications

The DICOM SR Document General Module may specify the Reason for the Requested Procedure as either free text in attribute (0040,1002), and/or as multiple coded values in attribute (0040,100A). These are mapped to the Procedure Indications subsection of the Clinical Information section of the CDA Imaging Report.

Note

Procedure indications may also be specified as SR content items in the (18785-6, LN, "Indications for Procedure") CONTAINER, which may be mapped to the CDA instance in accordance with Section C.4.3. It is an implementation decision how to handle multiple representations of indications in the SR document.

Table C.4-10. Clinical Information Procedure Indications mapping from SR

| CDA Business Name | DICOM SR |
|--|--|
| ClinicalInformation: ProcedureIndications: Text | <i>Referenced Request Sequence (0040,A370) > Reason for the Requested Procedure (0040,1002)</i> |
| ClinicalInformation: ProcedureIndications: CodedObservation[*]: ObsName | (432678004, SNOMED, "Indication for procedure") |
| ClinicalInformation: ProcedureIndications: CodedObservation[*]: ObsValue | <i>Referenced Request Sequence (0040,A370) > Reason for the Requested Procedure Code Sequence (0040,100A)</i> |

C.4.4.2 Current Procedure Descriptions

SR Instances using TID 2006 have a Current Procedure Descriptions section specified using TID 2007. Source data in that template and from the General Study Module is mapped into the CDA Procedure Description section.

Table C.4-11. Current Procedure Description mapping from SR

| CDA Business Name | DICOM SR |
|---|--|
| ProcedureDescription: ProcedureTechnique: ProcedureCode | <i>Procedure Code Sequence (0008,1032)</i> |

| CDA Business Name | DICOM SR |
|---|---|
| ProcedureDescription: ProcedureTechnique: EffectiveTime | (111060, DCM, "Study Date") + (111061, DCM, "Study Time") |
| ProcedureDescription: ProcedureTechnique: Modality | (122142, DCM, "Acquisition Device Type") |
| ProcedureDescription: ProcedureTechnique: MethodCode | |
| ProcedureDescription: ProcedureTechnique: TargetSite | (123014, DCM, "Target Region") |
| ProcedureDescription: ProcedureTechnique: Laterality | |
| ProcedureDescription: ProcedureTechnique: Ref | |

C.4.4.3 Radiation Exposure and Protection Information

The Radiation Exposure and Protection Information section defined in SR TID 2006 is specified using TID 2008, which provides additional source data for mapping into the equivalent CDA subsection of the Imaging Procedure Description section.

Table C.4-12. CDA Radiation Exposure and Protection Information mapping from SR

| CDA Business Name | DICOM SR |
|--|---|
| RadiationExposure: IrradiationAuthorizingID | |
| RadiationExposure: IrradiationAuthorizingName | (113850, DCM, "Irradiation Authorizing ") |
| RadiationExposure:SOPInstance[doseReport] | (113701, DCM, "X-Ray Radiation Dose Report") [from Current Procedure Description section] |
| RadiationExposure:CodedObservation[pregnancy] | (111532, DCM, "Pregnancy Status") |
| RadiationExposure:CodedObservation[indication] | (18785-6, LN, "Indications for Procedure") |
| RadiationExposure:CodedObservation[exposure] | (113921, DCM, "Radiation Exposure") |
| RadiationExposure:QuantityMeasurement | |
| RadiationExposure: RadioactivityDose | |
| RadiationExposure: Radiopharmaceutical | |
| RadiationExposure: FreeTextRadiopharmaceutical | (113922, DCM, "Radioactive Substance Administered") |

The Radiation Exposure Content Item in TID 2008 uses Value Type TEXT, not NUM, and is therefore mapped to a Coded Observation entry in accordance with Section C.4.3.2.

C.4.4.4 Key Images

TID 2005 Transcribed Diagnostic Imaging Report specifies a section structure for the Key Images section of an SR, which allows mapping into the equivalent CDA subsection of the Impression section.

Table C.4-13. Key Image mapping from SR

| CDA Business Name | DICOM SR |
|----------------------------------|--|
| KeyImages: Title | "Key Images" [or equivalent in local language] |
| KeyImages: Text | (113012, DCM, "Key Object Description") |
| KeyImages: Text: GraphicRef[*] | [Reference to ObservationMedia entry] |
| KeyImages: Text: ExtRef[*]: URL | [WADO link constructed from image reference] |
| KeyImages: SOPInstance[*] | [See C.4.3.3] |
| KeyImages: Graphic[*]: Image | [Thumbnail constructed from referenced image] |
| KeyImages: Graphic[*]: MediaType | [recommended "image/jpeg"] |
| KeyImages: Graphic[*]: ImageURI | |

C.5 Example

C.5.1 DICOM SR "Basic Diagnostic Imaging Report" (TID 2000)

The SR sample document encoding includes information on the SR document body tree depth (column 1: SR Tree Depth), nesting level for nested artifacts such as sequences and sequence items (column 2: Nesting), DICOM attribute names (column 3: Attribute), DICOM tag (column 4: Tag), the DICOM attribute value representation (Column 5: VR as specified in PS3.5), the hexadecimal value of value length (column 6: VL (hex)) and the sample document attribute values (column 7: Value).

Table C.5-1. Sample document encoding

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|-------------------------------------|-------------|----|----------|---|
| | | Instance Creation Date | (0008,0012) | DA | 0008 | 20060827 |
| | | Instance Creation Time | (0008,0013) | TM | 0006 | 224157 |
| | | Instance Creator UID | (0008,0014) | UI | 001c | 1.2.276.0.7230010.3.0.3.5.4 |
| | | SOP Class UID | (0008,0016) | UI | 001e | 1.2.840.10008.5.1.4.1.1.88.22 |
| | | SOP Instance UID | (0008,0018) | UI | 003c | 1.2.840.113619.2.62.994044785528.20060823.200608232232322.9 |
| | | Study Date | (0008,0020) | DA | 0008 | 20060823 |
| | | Content Date | (0008,0023) | DA | 0008 | 20060823 |
| | | Study Time | (0008,0030) | TM | 0006 | 222400 |
| | | Content Time | (0008,0033) | TM | 0006 | 224352 |
| | | Accession Number | (0008,0050) | SH | 0008 | 10523475 |
| | | Issuer of Accession Number Sequence | (0008,0051) | SQ | ffffff | |
| | %item | | | | | |
| | > | Local Namespace Entity ID | (0040,0032) | UT | 0008 | WUH-RIS |
| | > | Universal Entity ID | (0040,0032) | UT | 0024 | 1.2.840.113619.2.62.994044785528.27 |
| | > | Universal Entity ID Type | (0040,0033) | CS | 0004 | ISO |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | | Modality | (0008,0060) | CS | 0002 | SR |
| | | Manufacturer | (0008,0070) | LO | 000a | DicomWg20 |
| | | Referring Physician's Name | (0008,0090) | PN | 0010 | Smith^John^^MD |
| | | Procedure Code Sequence | (0008,1032) | SQ | ffffff | |
| | %item | | | | | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|--|-------------|----|----------|---|
| | > | Code Value | (0008,0100) | SH | 0006 | 11123 |
| | > | Coding Scheme Designator | (0008,0102) | SH | 0008 | 99WUHID |
| | > | Code Meaning | (0008,0104) | LO | 000c | X-Ray Study |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | | Referenced Performed Procedure Step Sequence | (0008,1111) | SQ | ffffff | |
| | %endseq | | | | | |
| | | Patient's Name | (0010,0010) | PN | 0008 | Doe^John |
| | | Patient ID | (0010,0020) | LO | 000a | 0000680029 |
| | | Issuer of Patient ID | (0010,0021) | LO | 001a | World University Hospital |
| | | Issuer of Patient ID Qualifiers Sequence | (0010,0024) | SQ | ffffff | |
| | %item | | | | | |
| | > | Universal Entity ID | (0040,0032) | UT | 0024 | 1.2.840.113619.2.62.994044785528.10 |
| | > | Universal Entity ID Type | (0040,0033) | CS | 0004 | ISO |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | | Patient's Birth Date | (0010,0030) | DA | 0008 | 19641128 |
| | | Patient's Sex | (0010,0040) | CS | 0002 | M |
| | | Study Instance UID | (0020,000d) | UI | 002e | 1.2.840.113619.2.62.994044785528.114289542805 |
| | | Series Instance UID | (0020,000e) | UI | 0036 | 1.2.840.113619.2.62.994044785528.20060823223142485052 |
| | | Study ID | (0020,0010) | SH | 0008 | 10523475 |
| | | Series Number | (0020,0011) | IS | 0004 | 560 |
| | | Instance Number | (0020,0013) | IS | 0006 | 07851 |
| 1 | | Value Type | (0040,a040) | CS | 000a | CONTAINER |
| 1 | | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1 | %item | | | | | |
| 1 | > | Code Value | (0008,0100) | SH | 0008 | 18782-3 |
| 1 | > | Coding Scheme Designator | (0008,0102) | SH | 0002 | LN |
| 1 | > | Code Meaning | (0008,0104) | LO | 000c | X-Ray Report |
| 1 | %enditem | | | | | |
| 1 | %endseq | | | | | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|---|-------------|----|----------|-------------------------------------|
| 1 | | Continuity Of Content | (0040,a050) | CS | 0008 | SEPARATE |
| | | Verifying Observer Sequence | (0040,a073) | SQ | ffffff | |
| | %item | | | | | |
| | > | Verifying Organization | (0040,a027) | LO | 001a | World University Hospital |
| | > | Verification DateTime | (0040,a030) | DT | 000e | 20060827141500 |
| | > | Verifying Observer Name | (0040,a075) | PN | 0012 | Blitz^Richard^^MD |
| | > | Verifying Observer Identification Code Sequence | (0040,a088) | SQ | ffffff | |
| | %item | | | | | |
| | >> | Code Value | (0008,0100) | SH | 0008 | 08150000 |
| | >> | Coding Scheme Designator | (0008,0102) | SH | 0008 | 99WUHID |
| | >> | Code Meaning | (0008,0104) | LO | 0016 | Verifying Observer ID |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | | Referenced Request Sequence | (0040,a370) | SQ | ffffff | |
| | %item | | | | | |
| | > | Accession Number | (0008,0050) | SH | 0008 | 10523475 |
| | > | Issuer of Accession Number Sequence | (0008,0051) | SQ | ffffff | |
| | %item | | | | | |
| | >> | Local Namespace Entity ID | (0040,0032) | UT | 0008 | WUH-RIS |
| | >> | Universal Entity ID | (0040,0032) | UT | 0024 | 1.2.840.113619.2.62.994044785528.27 |
| | >> | Universal Entity ID Type | (0040,0033) | CS | 0004 | ISO |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | > | Referenced Study Sequence | (0008,1110) | SQ | ffffff | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|---|-------------|----|----------|---|
| | %item | | | | | |
| | >> | Referenced SOP Class UID | (0008,1150) | UI | 001a | 1.2.840.10008.5.1.4.1.1.1 |
| | >> | Referenced SOP Instance UID | (0008,1155) | UI | 003c | 1.2.840.113619.2.62.994044785528.20060823.200608232232322.3 |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | > | Study Instance UID | (0020,000d) | UI | 002e | 1.2.840.113619.2.62.994044785528.114289542805 |
| | > | Requested Procedure Description | (0032,1060) | LO | 0020 | CHEST TWO VIEWS, PA AND LATERAL |
| | > | Requested Procedure Code Sequence | (0032,1064) | SQ | ffffff | |
| | %item | | | | | |
| | >> | Code Value | (0008,0100) | SH | 0006 | 11123 |
| | >> | Coding Scheme Designator | (0008,0102) | SH | 0008 | 99WUHID |
| | >> | Code Meaning | (0008,0104) | LO | 000c | X-Ray Study |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | > | Order Placer Identifier Sequence | (0040,0026) | SQ | ffffff | |
| | %item | | | | | |
| | >> | Local Namespace Entity ID | (0040,0032) | UT | 0008 | WUH-CPOE |
| | >> | Universal Entity ID | (0040,0032) | UT | 0024 | 1.2.840.113619.2.62.994044785528.29 |
| | >> | Universal Entity ID Type | (0040,0033) | CS | 0004 | ISO |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | > | Requested Procedure ID | (0040,1001) | SH | 0006 | 123453 |
| | > | Reason for the Requested Procedure | (0040,1002) | LO | 0014 | Suspected lung tumor |
| | > | Placer Order Number/Imaging Service Request | (0040,2016) | LO | 0006 | 123451 |
| | %enditem | | | | | |
| | %endseq | | | | | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|---|-------------|----|----------|---|
| | | Performed Procedure Code Sequence | (0040,a372) | SQ | ffffff | |
| | %item | | | | | |
| | > | Code Value | (0008,0100) | SH | 0006 | 11123 |
| | > | Coding Scheme Designator | (0008,0102) | SH | 0008 | 99WUHID |
| | > | Code Meaning | (0008,0104) | LO | 000c | X-Ray Study |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | | Current Requested Procedure Evidence Sequence | (0040,a375) | SQ | ffffff | |
| | %item | | | | | |
| | > | Referenced Series Sequence | (0008,1115) | SQ | ffffff | |
| | %item | | | | | |
| | >> | Referenced SOP Sequence | (0008,1199) | SQ | ffffff | |
| | %item | | | | | |
| | >>> | Referenced SOP Class UID | (0008,1150) | UI | 001a | 1.2.840.10008.5.1.4.1.1.1 |
| | >>> | Referenced SOP Instance UID | (0008,1155) | UI | 003c | 1.2.840.113619.2.62.994044785528.20060823.200608232232322.3 |
| | %enditem | | | | | |
| | %item | | | | | |
| | >>> | Referenced SOP Class UID | (0008,1150) | UI | 001a | 1.2.840.10008.5.1.4.1.1.1 |
| | >>> | Referenced SOP Instance UID | (0008,1155) | UI | 003c | 1.2.840.113619.2.62.994044785528.20060823.200608232231422.3 |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | >> | Series Instance UID | (0020,000e) | UI | 0036 | 1.2.840.113619.2.62.994044785528.20060823223142485051 |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | > | Study Instance UID | (0020,000d) | UI | 002e | 1.2.840.113619.2.62.994044785528.114289542805 |
| | %enditem | | | | | |
| | %endseq | | | | | |
| | | Completion Flag | (0040,a491) | CS | 0008 | COMPLETE |
| | | Verification Flag | (0040,a493) | CS | 0008 | VERIFIED |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|----------------------------|-------------|----|----------|-------------------------|
| 1 | | Content Sequence | (0040,a730) | SQ | ffffff | |
| 1.1 | %item | | | | | |
| 1.1 | > | Relationship Type | (0040,a010) | CS | 0010 | HAS CONCEPT MOD |
| 1.1 | > | Value Type | (0040,a040) | CS | 0004 | CODE |
| 1.1 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.1 | %item | | | | | |
| 1.1 | >> | Code Value | (0008,0100) | SH | 0006 | 122142 |
| 1.1 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.1 | >> | Code Meaning | (0008,0104) | LO | 0018 | Acquisition Device Type |
| 1.1 | %enditem | | | | | |
| 1.1 | %endseq | | | | | |
| 1.1 | > | Concept Code Sequence | (0040,a168) | SQ | ffffff | |
| 1.1 | %item | | | | | |
| 1.1 | >> | Code Value | (0008,0100) | SH | 0002 | XR |
| 1.1 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.1 | >> | Code Meaning | (0008,0104) | LO | 0002 | XR |
| 1.1 | %enditem | | | | | |
| 1.1 | %endseq | | | | | |
| 1.1 | %enditem | | | | | |
| 1.2 | %item | | | | | |
| 1.2 | > | Relationship Type | (0040,a010) | CS | 0010 | HAS CONCEPT MOD |
| 1.2 | > | Value Type | (0040,a040) | CS | 0004 | CODE |
| 1.2 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.2 | %item | | | | | |
| 1.2 | >> | Code Value | (0008,0100) | SH | 0006 | 123014 |
| 1.2 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.2 | >> | Code Meaning | (0008,0104) | LO | 000e | Target Region |
| 1.2 | %enditem | | | | | |
| 1.2 | %endseq | | | | | |
| 1.2 | > | Concept Code Sequence | (0040,a168) | SQ | ffffff | |
| 1.2 | %item | | | | | |
| 1.2 | >> | Code Value | (0008,0100) | SH | 0008 | T-D3000 |
| 1.2 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | SRT |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|----------------------------|-------------|----|----------|--|
| 1.2 | >> | Code Meaning | (0008,0104) | LO | 0006 | Chest |
| 1.2 | %enditem | | | | | |
| 1.2 | %endseq | | | | | |
| 1.2 | %enditem | | | | | |
| 1.3 | %item | | | | | |
| 1.3 | > | Relationship Type | (0040,a010) | CS | 0010 | HAS CONCEPT MOD |
| 1.3 | > | Value Type | (0040,a040) | CS | 0004 | CODE |
| 1.3 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.3 | %item | | | | | |
| 1.3 | >> | Code Value | (0008,0100) | SH | 0006 | 121049 |
| 1.3 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.3 | >> | Code Meaning | (0008,0104) | LO | 0028 | Language of Content Item and Descendants |
| 1.3 | %enditem | | | | | |
| 1.3 | %endseq | | | | | |
| 1.3 | > | Concept Code Sequence | (0040,a168) | SQ | ffffff | |
| 1.3 | %item | | | | | |
| 1.3 | >> | Code Value | (0008,0100) | SH | 0006 | en-US |
| 1.3 | >> | Coding Scheme Designator | (0008,0102) | SH | 0008 | ISO639_1 |
| 1.3 | >> | Code Meaning | (0008,0104) | LO | 000e | English (U.S.) |
| 1.3 | %enditem | | | | | |
| 1.3 | %endseq | | | | | |
| 1.3 | %enditem | | | | | |
| 1.4 | %item | | | | | |
| 1.4 | > | Relationship Type | (0040,a010) | CS | 0010 | HAS CONCEPT MOD |
| 1.4 | > | Value Type | (0040,a040) | CS | 0004 | TEXT |
| 1.4 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.4 | %item | | | | | |
| 1.4 | >> | Code Value | (0008,0100) | SH | 0006 | 121050 |
| 1.4 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.4 | >> | Code Meaning | (0008,0104) | LO | 0022 | Equivalent Meaning of Concept Name |
| 1.4 | %enditem | | | | | |
| 1.4 | %endseq | | | | | |
| 1.4 | > | Text Value | (0040,a160) | UT | 001c | Chest X-Ray, PA and LAT View |
| 1.4 | %enditem | | | | | |
| 1.5 | %item | | | | | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|----------------------------|-------------|----|----------|----------------------|
| 1.5 | > | Relationship Type | (0040,a010) | CS | 0010 | HAS OBS CONTEXT |
| 1.5 | > | Value Type | (0040,a040) | CS | 0004 | CODE |
| 1.5 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.5 | %item | | | | | |
| 1.5 | >> | Code Value | (0008,0100) | SH | 0006 | 121005 |
| 1.5 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.5 | >> | Code Meaning | (0008,0104) | LO | 000e | Observer Type |
| 1.5 | %enditem | | | | | |
| 1.5 | %endseq | | | | | |
| 1.5 | > | Concept Code Sequence | (0040,a168) | SQ | ffffff | |
| 1.5 | %item | | | | | |
| 1.5 | >> | Code Value | (0008,0100) | SH | 0006 | 121006 |
| 1.5 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.5 | >> | Code Meaning | (0008,0104) | LO | 0006 | Person |
| 1.5 | %enditem | | | | | |
| 1.5 | %endseq | | | | | |
| 1.5 | %enditem | | | | | |
| 1.6 | %item | | | | | |
| 1.6 | > | Relationship Type | (0040,a010) | CS | 0010 | HAS OBS CONTEXT |
| 1.6 | > | Value Type | (0040,a040) | CS | 0006 | PNAME |
| 1.6 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.6 | %item | | | | | |
| 1.6 | >> | Code Value | (0008,0100) | SH | 0006 | 121008 |
| 1.6 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.6 | >> | Code Meaning | (0008,0104) | LO | 0014 | Person Observer Name |
| 1.6 | %enditem | | | | | |
| 1.6 | %endseq | | | | | |
| 1.6 | > | Person Name | (0040,a123) | PN | 0012 | Blitz^Richard^^MD |
| 1.6 | %enditem | | | | | |
| 1.7 | %item | | | | | |
| 1.7 | > | Relationship Type | (0040,a010) | CS | 0008 | CONTAINS |
| 1.7 | > | Value Type | (0040,a040) | CS | 000a | CONTAINER |
| 1.7 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.7 | %item | | | | | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|----------------------------|-------------|----|----------|--------------|
| 1.7 | >> | Code Value | (0008,0100) | SH | 0006 | 121060 |
| 1.7 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.7 | >> | Code Meaning | (0008,0104) | LO | 0008 | History |
| 1.7 | %enditem | | | | | |
| 1.7 | %endseq | | | | | |
| 1.7 | > | Continuity Of Content | (0040,a050) | CS | 0008 | SEPARATE |
| 1.7 | > | Content Sequence | (0040,a730) | SQ | ffffff | |
| 1.7.1 | %item | | | | | |
| 1.7.1 | >> | Relationship Type | (0040,a010) | CS | 0008 | CONTAINS |
| 1.7.1 | >> | Value Type | (0040,a040) | CS | 0004 | TEXT |
| 1.7.1 | >> | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.7.1 | %item | | | | | |
| 1.7.1 | >>> | Code Value | (0008,0100) | SH | 0006 | 121060 |
| 1.7.1 | >>> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.7.1 | >>> | Code Meaning | (0008,0104) | LO | 0008 | History |
| 1.7.1 | %enditem | | | | | |
| 1.7.1 | %endseq | | | | | |
| 1.7.1 | >> | Text Value | (0040,a160) | UT | 000c | Sore throat. |
| 1.7.1 | %enditem | | | | | |
| 1.7 | %endseq | | | | | |
| 1.7 | %enditem | | | | | |
| 1.8 | %item | | | | | |
| 1.8 | > | Relationship Type | (0040,a010) | CS | 0008 | CONTAINS |
| 1.8 | > | Value Type | (0040,a040) | CS | 000a | CONTAINER |
| 1.8 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.8 | %item | | | | | |
| 1.8 | >> | Code Value | (0008,0100) | SH | 0006 | 121070 |
| 1.8 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.8 | >> | Code Meaning | (0008,0104) | LO | 0008 | Findings |
| 1.8 | %enditem | | | | | |
| 1.8 | %endseq | | | | | |
| 1.8 | > | Continuity Of Content | (0040,a050) | CS | 0008 | SEPARATE |
| 1.8 | > | Content Sequence | (0040,a730) | SQ | ffffff | |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|---------------------------------|-------------|----|----------|--|
| 1.8.1 | %item | | | | | |
| 1.8.1 | >> | Relationship Type | (0040,a010) | CS | 0008 | CONTAINS |
| 1.8.1 | >> | Value Type | (0040,a040) | CS | 0004 | TEXT |
| 1.8.1 | >> | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.8.1 | %item | | | | | |
| 1.8.1 | >>> | Code Value | (0008,0100) | SH | 0006 | 121071 |
| 1.8.1 | >>> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.8.1 | >>> | Code Meaning | (0008,0104) | LO | 0008 | Finding |
| 1.8.1 | %enditem | | | | | |
| 1.8.1 | %endseq | | | | | |
| 1.8.1 | >> | Text Value | (0040,a160) | UT | 01ae | The cardiomeastinum is within normal limits. The trachea is midline. The previously described opacity at the medial right lung base has cleared. There are no new infiltrates. There is a new round density at the left hilus, superiorly (diameter about 45mm). A CT scan is recommended for further evaluation. The pleural spaces are clear. The visualized musculoskeletal structures and the upper abdomen are stable and unremarkable. |
| 1.8.1 | >> | Content Sequence | (0040,a730) | SQ | ffffff | |
| 1.8.1.1 | %item | | | | | |
| 1.8.1.1 | >>> | Relationship Type | (0040,a010) | CS | 000e | INFERRED FROM |
| 1.8.1.1 | >>> | Observation DateTime | (0040,a032) | DT | 000e | 20060823223912 |
| 1.8.1.1 | >>> | Value Type | (0040,a040) | CS | 0004 | NUM |
| 1.8.1.1 | >>> | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.8.1.1 | %item | | | | | |
| 1.8.1.1 | >>>> | Code Value | (0008,0100) | SH | 0008 | M-02550 |
| 1.8.1.1 | >>>> | Coding Scheme Designator | (0008,0102) | SH | 0004 | SRT |
| 1.8.1.1 | >>>> | Code Meaning | (0008,0104) | LO | 0008 | Diameter |
| 1.8.1.1 | %enditem | | | | | |
| 1.8.1.1 | %endseq | | | | | |
| 1.8.1.1 | >>> | Measured Value Sequence | (0040,a300) | SQ | ffffff | |
| 1.8.1.1 | %item | | | | | |
| 1.8.1.1 | >>>> | Measurement Units Code Sequence | (0040,08ea) | SQ | ffffff | |
| 1.8.1.1 | %item | | | | | |
| 1.8.1.1 | >>>>> | Code Value | (0008,0100) | SH | 0002 | mm |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|-----------------------------|-------------|----|----------|---|
| 1.8.1.1 | >>>> | Coding Scheme Designator | (0008,0102) | SH | 0004 | UCUM |
| 1.8.1.1 | >>>> | Code Meaning | (0008,0104) | LO | 0002 | mm |
| 1.8.1.1 | %enditem | | | | | |
| 1.8.1.1 | %endseq | | | | | |
| 1.8.1.1 | >>>> | Numeric Value | (0040,a30a) | DS | 0002 | 45 |
| 1.8.1.1 | %enditem | | | | | |
| 1.8.1.1 | %endseq | | | | | |
| 1.8.1.1 | >>> | Content Sequence | (0040,a730) | SQ | ffffff | |
| 1.8.1.1.1 | %item | | | | | |
| 1.8.1.1.1 | >>>> | Referenced SOP Sequence | (0008,1199) | SQ | ffffff | |
| 1.8.1.1.1 | %item | | | | | |
| 1.8.1.1.1 | >>>> | Referenced SOP Class UID | (0008,1150) | UI | 001a | 1.2.840.10008.5.1.4.1.1.1 |
| 1.8.1.1.1 | >>>> | Referenced SOP Instance UID | (0008,1155) | UI | 003c | 1.2.840.113619.2.62.994044785528.20060823.200608232232322.3 |
| 1.8.1.1.1 | %enditem | | | | | |
| 1.8.1.1.1 | %endseq | | | | | |
| 1.8.1.1.1 | >>>> | Relationship Type | (0040,a010) | CS | 000e | INFERRED FROM |
| 1.8.1.1.1 | >>>> | Value Type | (0040,a040) | CS | 0006 | IMAGE |
| 1.8.1.1.1 | >>>> | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.8.1.1.1 | %item | | | | | |
| 1.8.1.1.1 | >>>> | Code Value | (0008,0100) | SH | 0006 | 121112 |
| 1.8.1.1.1 | >>>> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.8.1.1.1 | >>>> | Code Meaning | (0008,0104) | LO | 0016 | Source of Measurement |
| 1.8.1.1.1 | %enditem | | | | | |
| 1.8.1.1.1 | %endseq | | | | | |
| 1.8.1.1.1 | %enditem | | | | | |
| 1.8.1.1 | %endseq | | | | | |
| 1.8.1.1 | %enditem | | | | | |
| 1.8.1 | %endseq | | | | | |
| 1.8.1 | %enditem | | | | | |
| 1.8 | %endseq | | | | | |
| 1.8 | %enditem | | | | | |
| 1.9 | %item | | | | | |
| 1.9 | > | Relationship Type | (0040,a010) | CS | 0008 | CONTAINS |
| 1.9 | > | Value Type | (0040,a040) | CS | 000a | CONTAINER |

| SR Tree Depth | Nesting | Attribute | Tag | VR | VL (hex) | Value |
|---------------|----------|----------------------------|-------------|----|----------|---|
| 1.9 | > | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.9 | %item | | | | | |
| 1.9 | >> | Code Value | (0008,0100) | SH | 0006 | 121072 |
| 1.9 | >> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.9 | >> | Code Meaning | (0008,0104) | LO | 000c | Impressions |
| 1.9 | %enditem | | | | | |
| 1.9 | %endseq | | | | | |
| 1.9 | > | Continuity Of Content | (0040,a050) | CS | 0008 | SEPARATE |
| 1.9 | > | Content Sequence | (0040,a730) | SQ | ffffff | |
| 1.9.1 | %item | | | | | |
| 1.9.1 | >> | Relationship Type | (0040,a010) | CS | 0008 | CONTAINS |
| 1.9.1 | >> | Value Type | (0040,a040) | CS | 0004 | TEXT |
| 1.9.1 | >> | Concept Name Code Sequence | (0040,a043) | SQ | ffffff | |
| 1.9.1 | %item | | | | | |
| 1.9.1 | >>> | Code Value | (0008,0100) | SH | 0006 | 121073 |
| 1.9.1 | >>> | Coding Scheme Designator | (0008,0102) | SH | 0004 | DCM |
| 1.9.1 | >>> | Code Meaning | (0008,0104) | LO | 000a | Impression |
| 1.9.1 | %enditem | | | | | |
| 1.9.1 | %endseq | | | | | |
| 1.9.1 | >> | Text Value | (0040,a160) | UT | 009c | No acute cardiopulmonary process. Round density in left superior hilus, further evaluation with CT is recommended as underlying malignancy is not excluded. |
| 1.9.1 | %enditem | | | | | |
| 1.9 | %endseq | | | | | |
| 1.9 | %enditem | | | | | |
| 1 | %endseq | | | | | |

C.5.2 Transcoded HL7 CDA Release 2 Imaging Report

```

<?xml version="1.0" encoding="utf-8"?>
<?xml-stylesheet type="text/xsl" href="CDA-DIR.xsl"?>
<ClinicalDocument xmlns="urn:hl7-org:v3"
  xmlns:voc="urn:hl7-org:v3/voc"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:ps3-20="urn:dicom-org:ps3-20"
  xsi:schemaLocation="urn:hl7-org:v3 CDA.xsd">
  <realmCode code="UV"/>
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <templateId root="1.2.840.10008.9.1"/>
  <templateId root="1.2.840.10008.9.20"/>
  <templateId root="1.2.840.10008.9.21"/>

```

```

<templateId root="1.2.840.10008.9.22"/>
<id root="1.2.840.113619.2.62.994044785528.12" extension="20060828170821659"/>
<code code="18748-4" codeSystem="2.16.840.1.113883.6.1"
  codeSystemName="LOINC" displayName="Diagnostic Imaging Report"/>
<title>Chest X-Ray, PA and LAT View</title>
<effectiveTime value="20060828170821"/>
<confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25"/>
<languageCode code="en-US"/>
<recordTarget>
  <patientRole>
    <id root="1.2.840.113619.2.62.994044785528.10" extension="0000680029"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <patient>
      <name>
        <given>John</given>
        <family>Doe</family>
      </name>
      <administrativeGenderCode codeSystem="2.16.840.1.113883.5.1" code="M"/>
      <birthTime value="19641128"/>
    </patient>
  </patientRole>
</recordTarget>
<author>
  <time value="20060823224352"/>
  <assignedAuthor>
    <id extension="121008" root="2.16.840.1.113883.19.5"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <assignedPerson>
      <name>
        <given>Richard</given>
        <family>Blitz</family>
        <suffix>MD</suffix>
      </name>
    </assignedPerson>
  </assignedAuthor>
</author>
<custodian>
  <!-- custodian values have been added based on organizational policy (int his
  case they are not mapped from the SR sample document) -->
  <assignedCustodian>
    <representedCustodianOrganization>
      <id root="2.16.840.1.113883.19.5"/>
      <name>World University Hospital</name>
      <telecom nullFlavor="NI"/>
      <addr nullFlavor="NI"/>
    </representedCustodianOrganization>
  </assignedCustodian>
</custodian>
<!-- legal authenticator present in sample, document is VERIFIED -->
<legalAuthenticator>
  <time value="20060827141500"/>
  <!-- Verification DateTime (0040,A030) -->
  <signatureCode code="S"/>
  <assignedEntity>
    <id extension="08150000" root="1.2.840.113619.2.62.994044785528.33"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <assignedPerson>

```

```

    <name>
      <given>Richard</given>
      <family>Blitz</family>
      <suffix>MD</suffix>
    </name>
  </assignedPerson>
</assignedEntity>
</legalAuthenticator>
<!-- Mapped from Referring Physician's Name (0008,0090) SR sample document -->
<participant typeCode="REF">
  <associatedEntity classCode="PROV">
    <id nullFlavor="NI"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <associatedPerson>
      <name>
        <given>John</given>
        <family>Smith</family>
        <suffix>MD</suffix>
      </name>
    </associatedPerson>
  </associatedEntity>
</participant>
<inFulfillmentOf>
  <order>
    <id extension="123451" root="1.2.840.113619.2.62.994044785528.29"/>
    <ps3-20:accessionNumber extension="10523475" root="1.2.840.113619.2.62.994044785528.27"/>
  </order>
</inFulfillmentOf>
<documentationOf>
  <serviceEvent classCode="ACT">
    <id root="1.2.840.113619.2.62.994044785528.114289542805"/>
    <!-- Study Instance UID -->
    <code code="11123" codeSystem="1.2.840.113619.2.62.5661"
      codeSystemName="99WUHID" displayName="X-Ray Study"/>
    <translation code="XR" displayName="XR"
      codeSystem="1.2.840.10008.2.16.4" codeSystemName="DCM"/>
    <translation code="51185008" displayName="Chest"
      codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"/>
    <!-- anatomy code mapped from old style SNOMED in SR to new -->
  </code>
</code>
<effectiveTime>
  <low value="20060823222400"/>
</effectiveTime>
</serviceEvent>
</documentationOf>
<!-- transformation of a DICOM SR -->
<relatedDocument typeCode="XFRM">
  <parentDocument>
    <id root="1.2.840.113619.2.62.994044785528.20060823.200608232232322.9"/>
    <!-- SOP Instance UID (0008,0018) of SR sample document-->
  </parentDocument>
</relatedDocument>
<component>
  <structuredBody>
    <component>
      <!-- ***** Clinical Information Section ***** -->
      <section>
        <templateId root="1.2.840.10008.9.2"/>

```

```

<code code="55752-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Clinical Information"/>
<title>Clinical Information</title>
<component>
  <!-- ***** Procedure Indications Subsection ***** -->
  Section text mapped from "Reason for the Requested Procedure" (0040,1002)
  within the Referenced Request Sequence (0040,A370) of the SR header, under
  the assumption that the header attribute value has been displayed to, and
  accepted by, the legal authenticator.-->
  <section>
    <templateId root="2.16.840.1.113883.10.20.22.2.29"/>
    <id root="1.2.840.10213.2.62.044785528.1142895426"/>
    <code code="59768-2" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Procedure Indications"/>
    <title>Indications for Procedure</title>
    <text>Suspected lung tumor</text>
  </section>
  <!-- ***** End of Procedure Indications Subsection ***** -->
</component>
<component>
  <!-- ***** History Subsection ***** -->
  <section>
    <templateId root="2.16.840.1.113883.10.20.22.2.39"/>
    <id root="1.2.840.10213.2.62.7044785528.114289875"/>
    <code code="11329-0" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="History General"/>
    <title>History</title>
    <text>
      <paragraph>
        <caption>History</caption>
        <content ID="Fndng1">Sore throat.</content>
      </paragraph>
    </text>
    <entry>
      <!-- History report element (TEXT) -->
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.6.2.12"/>
        <code code="121060" codeSystem="1.2.840.10008.2.16.4"
        codeSystemName="DCM" displayName="History"/>
        <value xsi:type="ED">
          <reference value="#Fndng1"/>
        </value>
      </observation>
    </entry>
  </section>
  <!-- ***** End of History Subsection ***** -->
</component>
<!-- ***** End of Clinical Information Section ***** -->
</component>
<component>
  <!-- ***** Imaging Procedure Description Section ***** -->
  <section classCode="DOCSECT" moodCode="EVN">
    <templateId root="1.2.840.10008.9.3"/>
    <id root="1.2.840.10213.2.62.9940434234785528.11428954534542805"/>
    <code code="55111-9" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Current Imaging Procedure Description"/>
    <title>Imaging Procedure Description</title>
    <text> </text>
    <entry>
      <procedure moodCode="EVN" classCode="PROC">
        <templateId root="1.2.840.10008.9.14"/>

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<id root="1.2.840.6544.33.9100653988998717.997527582345600170"/>
<code code="11123" displayName="X-Ray Study"
codeSystem="1.2.840.113619.2.62.5661" codeSystemName="99WUHID"/>
<effectiveTime value="20060823222400"/>
<methodCode code="XR" displayName="XR"
codeSystem="1.2.840.10008.2.16.4" codeSystemName="DCM"/>
<targetSiteCode code="51185008" displayName="Chest"
codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"/>
</procedure>
</entry>
<component>
<!-- ***** DICOM Object Catalog Sub-section ***** -->
<section classCode="DOCSECT" moodCode="EVN">
<templateId root="2.16.840.1.113883.10.20.6.1.1"/>
<code code="121181" codeSystem="1.2.840.10008.2.16.4"
codeSystemName="DCM" displayName="DICOM Object Catalog"/>
<entry>
<!-- ***** Study ***** -->
<act classCode="ACT" moodCode="EVN">
<templateId root="2.16.840.1.113883.10.20.6.2.6"/>
<id root="1.2.840.113619.2.62.994044785528.114289542805"/>
<code code="113014" codeSystem="1.2.840.10008.2.16.4"
codeSystemName="DCM" displayName="Study"/>
<!-- ***** Series (Parent SR Document) ***** -->
<entryRelationship typeCode="COMP">
<act classCode="ACT" moodCode="EVN">
<id root="1.2.840.113619.2.62.994044785528.20060823222132232023"/>
<code code="113015" codeSystem="1.2.840.10008.2.16.4"
codeSystemName="DCM" displayName="Series">
<qualifier>
<name code="121139" codeSystem="1.2.840.10008.2.16.4"
codeSystemName="DCM" displayName="Modality">
</name>
<value code="CR" codeSystem="1.2.840.10008.2.16.4"
codeSystemName="DCM" displayName="SR Document">
</value>
</qualifier>
</code>
<!-- ***** SOP Instance UID ***** -->
<!-- Reference to SR Document -->
<entryRelationship typeCode="COMP">
<observation classCode="DGIMG" moodCode="EVN">
<templateId root="2.16.840.1.113883.10.20.6.2.8"/>
<id
root="1.2.840.113619.2.62.994044785528.20060823.200608242334312.3"/>
<code code="1.2.840.10008.5.1.4.1.1.88.22" codeSystem="1.2.840.10008.2.6.1"
codeSystemName="DCMUID" displayName="Enhanced SR">
</code>
<text mediaType="application/dicom">
<reference value="http://www.example.org/wado?requestType=WADO
&studyUID=1.2.840.113619.2.62.994044785528.114289542805
&seriesUID=1.2.840.113619.2.62.994044785528.20060823222132232023
&objectUID=1.2.840.113619.2.62.994044785528.20060823.20060823223222.9
&contentType=application/dicom"/>
<!--reference to image 1 (PA) -->
</text>
<effectiveTime value="20060823223232"/>
</observation>
</entryRelationship>
</act>

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</entryRelationship>
<!-- ***** Series (CR Images) ***** -->
<entryRelationship typeCode="COMP">
  <act classCode="ACT"
    moodCode="EVN">
    <id root="1.2.840.113619.2.62.994044785528.20060823223142485051"/>
    <code code="113015" codeSystem="1.2.840.10008.2.16.4"
      codeSystemName="DCM" displayName="Series">
      <qualifier>
        <name code="121139" codeSystem="1.2.840.10008.2.16.4"
          codeSystemName="DCM" displayName="Modality">
          </name>
        <value code="CR" codeSystem="1.2.840.10008.2.16.4"
          codeSystemName="DCM" displayName="Computed Radiography">
          </value>
        </qualifier>
      </code>
    <!-- ***** SOP Instance UID ***** -->
    <!-- 2 References (chest PA and LAT) -->
    <entryRelationship typeCode="COMP">
      <observation classCode="DGIMG" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.6.2.8"/>
        <id root="1.2.840.113619.2.62.994044785528.20060823.200608232232322.3"/>
        <code code="1.2.840.10008.5.1.4.1.1.1" codeSystem="1.2.840.10008.2.6.1"
          codeSystemName="DCMUID" displayName="Computed Radiography Image Storage">
          </code>
        <text mediaType="application/dicom">
          <reference value="http://www.example.org/wado?requestType=WADO
            &studyUID=1.2.840.113619.2.62.994044785528.114289542805
            &seriesUID=1.2.840.113619.2.62.994044785528.20060823223142485051
            &objectUID=1.2.840.113619.2.62.994044785528.20060823.200608232232322.3
            &contentType=application/dicom"/>
          <!--reference to image 1 (PA) -->
          </text>
          <effectiveTime value="20060823223232"/>
        </observation>
      </entryRelationship>
    <entryRelationship typeCode="COMP">
      <observation classCode="DGIMG" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.6.2.8"/>
        <id root="1.2.840.113619.2.62.994044785528.20060823.200608232231422.3"/>
        <code code="1.2.840.10008.5.1.4.1.1.1" codeSystem="1.2.840.10008.2.6.1"
          codeSystemName="DCMUID" displayName="Computed Radiography Image Storage">
          </code>
        <text
          mediaType="application/dicom">
          <reference value="http://www.example.org/wado?requestType=WADO
            &studyUID=1.2.840.113619.2.62.994044785528.114289542805
            &seriesUID=1.2.840.113619.2.62.994044785528.20060823223142485051
            &objectUID=1.2.840.113619.2.62.994044785528.20060823.200608232231422.3
            &contentType=application/dicom"/>
          <!--reference to image 2 (LAT) -->
          </text>
          <effectiveTime value="20060823223142"/>
        </observation>
      </entryRelationship>
    </act>
  </entryRelationship>
</act>
</entry>

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    </section>
    <!-- ***** End of DICOM Object Catalog Subsection ***** -->
  </component>
</section>
<!-- ***** End of Imaging Procedure Description Section ***** -->
</component>
<component>
  <!-- ***** Findings Section ***** -->
  <section>
    <templateId root="2.16.840.1.113883.10.20.6.1.2"/>
    <id root="1.2.840.10213.2.62.9940434234785528.114289545000804445"/>
    <code code="59776-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Findings"/>
    <title>Findings</title>
    <text>
      <paragraph>
        <caption>Finding</caption>
        <content ID="Fndng2">The cardiomedastinum is within normal limits. The trachea is midline.
          The previously described opacity at the medial right lung base has cleared. There are no new
          infiltrates. There is a new round density at the left hilus, superiorly (diameter about 45mm).
          A CT scan is recommended for further evaluation. The pleural spaces are clear. The visualized
          musculoskeletal structures and the upper abdomen are stable and unremarkable.</content>
      </paragraph>
      <paragraph>
        <caption>Diameter</caption>
        <content ID="Diam2">45mm</content>
      </paragraph>
      <paragraph>
        <caption>Source of Measurement</caption>
        <content ID="SrceOfMeas2">
          <linkHtml
            href="http://www.example.org/wado?requestType=WADO
              &studyUID=1.2.840.113619.2.62.994044785528.114289542805
              &seriesUID=1.2.840.113619.2.62.994044785528.20060823223142485051
              &objectUID=1.2.840.113619.2.62.994044785528.20060823.200608232232322.3
              &contentType=application/dicom">Chest_PA</linkHtml>
          </content>
        </paragraph>
      </text>
    <entry>
      <observation classCode="OBS" moodCode="EVN">
        <!-- Text Observation -->
        <templateId root="2.16.840.1.113883.10.20.6.2.12"/>
        <code code="121071" codeSystem="1.2.840.10008.2.16.4" codeSystemName="DCM" displayName="Finding"/>
        <value xsi:type="ED">
          <reference value="#Fndng2"/>
        </value>
        <!-- inferred from measurement -->
        <entryRelationship typeCode="SPRT">
          <observation classCode="OBS" moodCode="EVN">
            <templateId root="2.16.840.1.113883.10.20.6.2.14"/>
            <code code="246120007" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED"
              displayName="Nodule size">
              <originalText>
                <reference value="#Diam2"/>
              </originalText>
            </code>
            <!-- no DICOM attribute <statusCode code="completed"/> -->
            <effectiveTime value="20060823223912"/>
            <value xsi:type="PQ" value="45" unit="mm"/>
            <!-- inferred from image -->

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<entryRelationship typeCode="SUBJ">
  <observation classCode="DGIMG" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.6.2.8"/>
    <!-- (0008,1155) Referenced SOP Instance UID-->
    <id root="1.2.840.113619.2.62.994044785528.200608232232322.3"/>
    <!-- (0008,1150) Referenced SOP Class UID -->
    <code code="1.2.840.10008.5.1.4.1.1.1"codeSystem="1.2.840.10008.2.6.1"
      codeSystemName="DCMUID"displayName="Computed Radiography Image Storage">
    </code>
    <text mediaType="application/dicom">
      <!--reference to CR DICOM image (PA view) -->
      <reference
        value="http://www.example.org/wado?requestType=WADO
          &studyUID=1.2.840.113619.2.62.994044785528.114289542805
          &seriesUID=1.2.840.113619.2.62.994044785528.20060823223142485051
          &objectUID=1.2.840.113619.2.62.994044785528.200608232232322.3
          &contentType=application/dicom"/>
      </text>
    <effectiveTime value="20060823223232"/>
    <!-- Purpose of Reference -->
    <entryRelationship typeCode="RSON">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.6.2.9"/>
        <code code="ASSERTION"codeSystem="2.16.840.1.113883.5.4"/>
        <value xsi:type="CD" code="121112"codeSystem="1.2.840.10008.2.16.4"
          codeSystemName="DCM"displayName="Source of Measurement">
          <originalText>
            <reference value="#SrceOfMeas2"
              />
          </originalText>
        </value>
      </observation>
    </entryRelationship>
  </observation>
</entryRelationship>
</observation>
</entryRelationship>
</observation>
</entryRelationship>
</observation>
</entryRelationship>
</component>
<component>
  <!--***** Impressions Section *****-->
  <section>
    <templateId root="1.2.840.10008.9.5"/>
    <id root="1.2.840.10213.2.62.9940434234785528.114289545345927752"/>
    <code code="19005-8" codeSystem="2.16.840.1.113883.6.1"codeSystemName="LOINC" displayName="Impressions"/>
    <title>Impressions</title>
    <text>
      <paragraph>
        <caption>Impression</caption>
        <content ID="Fndng3">No acute cardiopulmonary process. Round density in left superior hilus, further
          evaluation with CT is recommended as underlying malignancy is not excluded.</content>
      </paragraph>
    </text>
    <entry>
      <!-- Impression report element (TEXT) -->
      <observation classCode="OBS" moodCode="EVN">
        <!-- Text Observation -->

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<templateId root="2.16.840.1.113883.10.20.6.2.12"/>
<code code="121073" codeSystem="1.2.840.10008.2.16.4" codeSystemName="DCM" displayName="Impression"/>
<value xsi:type="ED">
  <reference value="#Fndng3"/>
</value>
</observation>
</entry>
</section>
<!-- ***** End of Impressions
      Section ***** -->
</component>
</structuredBody>
</component>
</ClinicalDocument>
```

