Digital Imaging and Communications in Medicine (DICOM)

Supplement 36: Codes and Controlled Terminology

DICOM Standards Committee

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Foreword

The American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA) formed a joint committee to develop a standard for Digital Imaging and Communications in Medicine (DICOM). This DICOM Standard and the corresponding Supplements to the DICOM Standard were developed according to the NEMA procedures.

This Supplement to the Standard is developed in liaison with other standardization organizations including CEN TC251 in Europe and JIRA in Japan, with review also by other organizations including IEEE, HL7 and ANSI in the USA. This Supplement has been prepared by the DICOM Working Group 6 (Base Standard) and Working Group 8 (Structured Reporting).

The DICOM Standard is structured as a multi-part document using the guidelines established in the following document:

- ISO/IEC Directives, 1989 Part 3 : Drafting and Presentation of International Standards.

This document is a Supplement to the DICOM Standard. It is an extension to PS 3.3, 3.4 and 3.6 of the published DICOM Standard which consists of the following parts:

PS 3.1	-	Introduction and Overview
PS 3.2	-	Conformance
PS 3.3	-	Information Object Definitions
PS 3.4	-	Service Class Specifications
PS 3.5	-	Data Structures and Encoding
PS 3.6	-	Data Dictionary
PS 3.7	-	Message Exchange
PS 3.8	-	Network Communication Support for Message Exchange
PS 3.9	-	Point-to-Point Communication Support for Message Exchange
PS 3.10		Media Storage and File Format for Data Interchange
PS 3.11		Media Storage Application Profiles
PS 3.12		Media Formats and Physical Media for Data Interchange
PS 3.13		Print Management Point-to-Point Communication Support
PS 3.14		Grayscale Standard Display Function

These parts are related but independent documents.

This Supplement extends the definition of Codes and Controlled Terminology.

Scope and Field of Application

The Systematized Nomenclature for Human and Veterinary Medicine (SNOMED) DICOM Microglossary (SDM) provides controlled terminology for DICOM Code Sequence Attributes. The "Baseline Context ID Numbers" cited in this specification refer to SDM Context Groups. Context Groups are context-dependent Attribute Value Sets specified as lists of related terms or phrases from a terminology coding system such as SNOMED or the Logical Observation Identifiers, Names, and Codes (LOINC) database.

The current version of the SNOMED DICOM Microglossary is available from the College of American Pathologists by Internet from http://www.snomed.org/sdm/sdm.htm. The current version of the LOINC Database is available from the LOINC Committee, chairman: Dr. Clement J. McDonald, Department of Internal Medicine, Regenstreif Institute, Indianapolis, Indiana or from the Duke University Healthcare Data Interchange Standards Server: http://www.mcis.duke.edu/standards/termcode/loinc.htm

In the DICOM X-Ray Angiography (XA), Nuclear Medicine (NM), and Ultrasound (US) SOP Classes, approved in 1995, a provisional Coding Scheme Identifier of "99SDM" was assigned to the SNOMED DICOM Microglossary. Some changes in design details of the SDM have been made since 1995. The SDM is used by current DICOM Supplements as a message/terminology Mapping Resource rather than a Coding Scheme. A message/terminology Mapping Resource is a database of context-dependent Attribute Value Set specifications. The Semantic Types in the original SDM are now Concept Groups (i.e. Attribute Value Sets) identified by Context ID Numbers. The terms within the Context Groups may come from a variety of coding schemes (BI-RADS, ACR Findings Codes, CPT, ICD, READ), though the predominant ones for clinical data in biomedical imaging are currently SNOMED and LOINC codes.

A generic message/terminology mapping resource, the Terminology Resource for Message Standards (TeRMS) has been proposed for common use by data interchange (message, document, and terminology) standards developers and the user community. The TeRMS resource could provide the basis for a shared understanding of coded-entry Concepts that would transcend the domains of individual standards. TeRMS is designated as an alternate message/terminology Mapping Resource for DICOM Code Sequence Attributes.

The SNOMED DICOM Microglossary would be a subset of the proposed TeRMS (Terminology Resource for Message Standards) message/terminology Mapping Resource. At the time of this writing, Health Level Seven, Inc. (HL7) is designing its controlled terminology resource (the HL7 Vocabulary) in consultation with the NLM, the DICOM Standards Committee, the American Society for Testing and Materials (ASTM), terminology developers, and other organizations. To facilitate development of a common DICOM and HL7 view of controlled terminology, the HL7 Vocabulary is designated in this Supplement as an alternate message/terminology Mapping Resource for DICOM Code Sequence Attributes. The HL7 Vocabulary, as now conceptualized, could also be a subset of the proposed TeRMS resource along with the SDM.

Since this document proposes changes to existing Parts of DICOM the reader should have a working understanding of the Standard. This proposed Supplement includes a number of Addenda to existing Parts of DICOM :

- PS 3.2
- PS 3.3
- PS 3.4
- PS 3.6

Changes to:

NEMA Standards Publication PS 3.2

Digital Imaging and Communications in Medicine (DICOM)

Part 2: Conformance

Item: Amend Section 6 with the bold underlined text:

6 PURPOSE OF A CONFORMANCE STATEMENT

An implementation need not employ all the optional components of the DICOM Standard. After meeting the minimum general requirements, a conforming DICOM implementation may utilize whatever SOP Classes, communications protocols, Media Storage Application Profiles, optional (Type 3) Attributes, **codes and controlled terminology,** etc., needed to accomplish its designed task.

Item: Amend Section 6.1 with the bold underlined text:

6.1 OVERVIEW OF NETWORKING SECTION FOR CONFORMANCE STATEMENTS

The networking section of a Conformance Statements consists of the following major parts:

...

- a description of any extensions, specializations, and publicly disclosed privatizations in this implementation;
- a section describing DICOM related configuration details;
- a description of any implementation details which may be related to DICOM conformance or interoperability~~.~~**;**
- **a description of what codes and controlled terminology mechanisms are used.**

Item: Amend Section 6.2 with the bold underlined text:

6.2 OVERVIEW OF MEDIA STORAGE SECTION FOR CONFORMANCE STATEMENTS

The media storage section of a Conformance Statements consists of the following major parts:

...

- a section describing DICOM related configuration details;
- a description of any implementation details which may be related to DICOM conformance or interoperability~~.~~**;**
- **a description of what codes and controlled terminology mechanisms are used.**

Item: Add Section A.7:

A.7 CODES AND CONTROLLED TERMINOLOGY

Any support for Codes and Controlled Terminology, such as the use of the SNOMED DICOM Microglossary as a Mapping Resource, shall be described here. In particular, this section shall specify whether or not the Baseline Context Groups defined in DICOM PS 3.3 are used, or what alternative Context Groups or Coding Schemes, include private ones, are used and where their contents are defined.

Item: Add Section B.7:

B.7 CODES AND CONTROLLED TERMINOLOGY

This implementation makes use of the Baseline Context Groups as specified in the IODs for the SOP Classes supported, and uses the SNOMED DICOM Microglossary Version XXX as a Mapping Resource.

No Private Mapping Resources or Coding Schemes are used.

The SCU implementation selects codes from a Pick List presented to the operator.

The SCP implementation annotates the display with meanings derived from the specified Coding Schemes, or uses the specified Code Meaning if not found..

Item: Add Section C.7:

C.7 CODES AND CONTROLLED TERMINOLOGY

Any support for Codes and Controlled Terminology, such as the use of the SNOMED DICOM Microglossary as a Mapping Resource, shall be described here. In particular, this section shall specify whether or not the Baseline Context Groups defined in DICOM PS 3.3 are used, or what alternative Context Groups or Coding Schemes, include private ones, are used and where their contents are defined.

Item: Add Section D.7:

D.7 CODES AND CONTROLLED TERMINOLOGY

The SOP Classes supported by this implementation do not support the use of Codes and Controlled Terminology.

Changes to:

NEMA Standards Publication PS 3.3

Digital Imaging and Communications in Medicine (DICOM)

Part 3: Information Object Definitions

Item: Add Section 3.10 with the following definitions to PS 3.3

3.10 CODES AND CONTROLLED TERMINOLOGY DEFINITIONS:

The following definitions are used in the specification of Interpretation Data Interchange:

3.10.1 **Baseline Context ID:** Identifier of the Baseline Context Group.

3.10.2 **Baseline Context Group:** Context Group that specifies the suggested Value Set for a Code Sequence Attribute.

3.10.3 **Baseline Template:** Template that specifies a suggested set of Properties and corresponding Value Sets.

3.10.4 **Baseline Template ID:** Identifier of the Baseline Template.

3.10.5 **Code Sequence Attribute:** Attribute that (usually) includes the string "Code Sequence" in the Attribute Name and has a VR of SQ (Sequence of Items). Its purpose is to encode concepts using code values and optional text meanings from coding schemes such as the Systematized Nomenclature of Human and Veterinary Medicine (SNOMED), College of American Pathologists, Northfield, IL. Sections 8.1 through 8.8 specify the Attributes of which the Sequence Items (Attribute Sets) of Code Sequence Attributes are constructed. See Annex D for further explanation.

3.10.6 **Concept:** An idea. An abstraction of a real-world entity, process, feeling, or sensation.

3.10.7 **Context Group:** Attribute Value Set defined by a message/terminology Mapping Resource.

3.10.8 **Context Group Version:** Version of a Context Group. Expressed as date/time.

3.10.9 **Context ID (CID):** Identifier of a Context Group.

3.10.10 **Enomen:** English Nomenclature (field of the SDM).

3.10.11 **Mapping Resource:** Database that provides context-dependent usage constraints (i.e. Value Set or Relationship Type restrictions) for Attributes. An information resource that specifies the mapping of the content of an external controlled terminology to the components of a message standard.

3.10.12 **Mapping Resource Version:** Date of last revision of the Mapping Resource. The Mapping Resource Version date is the date of last revision of any Context Group, Template, or other item that it contains.

3.10.13 **Pick List:** The set of strings that are the allowed values of a Code Sequence Attribute in a given clinical or operational context.

3.10.14 **Property:** One facet of the description of a complex concept. The basic component of a Template.

3.10.15 **Relationship Type:** The constraints imposed upon the association between two Concepts. Examples: "is a", "has", "is adjacent to".

3.10.16 **SNOMED DICOM Microglossary (SDM):** A Message/terminology Mapping Resource that provides context-dependent Attribute Value Sets for DICOM Attributes from the Systematized Nomenclature of Human and Veterinary Medicine (SNOMED) and other Coding Schemes.

3.10.17 **Template:** The set of Properties that fully describe a concept. A Template may be used to specify the categories of information and the corresponding suggested Value Sets for the fields of a document, such as an Image-interpretation Report. A Template may utilize references to Context Groups or to other Templates.

3.10.18 **Template ID (TID):** Identifier of a Template. Example: SDM Template ID 2 (or TID 2).

3.10.19 **Template Version**: Version of a Template. Expressed as a date/time.

3.10.20 **Value Set:** The domain of an Attribute. The set of Concepts and strings that are the allowed values of a Code Sequence Attribute in a given clinical or operational context.

Item: Retire Section 5.3 of PS 3.3.

~~**5.3 Triplet Encoding of Structured Data**~~

~~Structured data entry using standardized coding schemes is a fundamental requirement of a computer-based patient record. Many DICOM modules utilize sequences to allow structured data entry to convey coded entries of many types (e.g. Primary Anatomic Structure Sequence (0008,2228), Patient's Insurance Plan Code Sequence (0010,0050), Interventional Drug Sequence (0018,0029)). These sequences utilize triplets to define the coding scheme to be used (Coding Scheme Designator (0008,0102)), a code value from that scheme (Code Value (0008,0100)), and the textual translation of that code value (Code Meaning (0008,0104)).~~

~~Note: Triplet encoding of such coded entries is compatible with the ANSI HISPP Common Data Types (see the ANSI HISPP MSDS Common Data Types document).~~

~~The Code Value (0008,0100) is a computer readable and computer searchable identifier that is unambiguous within the Coding Scheme.~~

~~The Coding Scheme Designator (0008,0102) uniquely identifies the table (Coding Scheme) where the Code Value (0008,0100) is linked to its Code Meaning (0008,0104). Common coding schemes include CPT, ICD-9, SNOMED, etc. Coding Scheme Designators available for use by DICOM implementations are described in Annex D.~~

~~Note: Until an internationally-recognized Coding Scheme Designator registration authority is available (such as the authority proposed in CEN/TC251/PT005 FFV Document, Health Care Informatics Interchange - Registration of Coding Schemes), the tables of provisional Coding Scheme Designators found in the ANSI HISPP Common Data Types document (duplicated in Annex D of PS 3.3) may be used.~~

~~The Code Meaning (0008,0104) is human readable text which is provided for the convenience of the readers of the Information Object (i.e., the reader would not need to refer to the Coding Scheme to find the interpretation of the Code Value (0008,0100)).~~

~~Note: Data Elements having 1) a VR of SQ (Sequence of Items) and 2) containing triplet-encoded items (utilizing Coding Scheme Designator, Code Value, Code Meaning) within one or more component sequence(s) may conceivably require additional encoding and/or interpretation rules (semantic mapping for most advantageous use with a particular coding scheme in a given context). The SNOMED DICOM MICROGLOSSARY (SDM), referenced in this Standard as coding Scheme Designator 99SDM, links sets of appropriate terms from SNOMED International (College of American Pathologists, Northfield, IL) to DICOM Data Elements. The SDM lists the appropriate SNOMED terms and the semantic dependencies for DICOM triplet-encoded sequence Data Elements according to SOP Class UID and real-world functional context. The SDM maps DICOM concepts to the Unified Medical Language System (UMLS) of the United States National Library of Medicine. Each SDM record contains a UMLS unique concept identifier (CUI) that links a DICOM concept to the UMLS knowledge sources and enables information retrieval from bibliographic resources via the NLM Medical Subject Headings (MeSH). The SDM also provides a shared mapping of Data Elements among message standards.~~

~~If the Coding Scheme Designator (0008,0102) of a particular triplet encoded Data Element is 99SDM, then the Code Value (0008,0100) for that Data Element will be the Source UID value from a SNOMED DICOM Microglossary record. This record will have a Data Element UID which matches the Data Element Tag of the DICOM triplet encoded sequence and Class UID consistent with the DICOM SOP Class UID of the Data Set being encoded. The Semantic Type of the SDM record will match the Semantic Type called for by the DICOM description of that attribute. Unless otherwise stated in this Standard, the SDM record may have any Context value.~~

Item: Add the following text as Section 8 of PS 3.3.

8 Encoding of Coded Entry Data

Code Sequence Attributes are those Attributes whose values are encoded as a Sequence of Items of the particular form described in this section. These Attributes typically include the string "Code Sequence" in the Attribute Name. Their purpose is to encode concepts using code values and optional text meanings from coding schemes such as the Systematized Nomenclature of Human and Veterinary Medicine (SNOMED, College of American Pathologists, Northfield, IL). Sections 8.1 through 8.6 of this Part specify the Coded Entry Attributes of which Code Sequence Attributes are constructed. Section 8.7 specifies certain dependencies on message/terminology Mapping Resources. Section 8.8 specifies the default set of Attributes encapsulated in the Items of Code Sequence Attributes. See Annex D of this Part for further explanation.

Notes: 1. In this Standard, Code Sequence Attributes are defined for a variety of concepts, for example: Primary Anatomic Structure Sequence (0008,2228) and other Attributes to describe anatomy; Patient's Insurance Plan Code Sequence (0010,0050), to identify insurance plans; and Interventional Drug Code Sequence (0018,0029), to document administration of drugs that have special significance in Imaging Procedures.

2. The VR of Code Sequence Attributes is SQ. Sub-sections 8.1 through 8.6 specify the six Coded Entry Attributes of which Code Sequence Attributes are constructed.

Coded Entry Attributes convey at least the Coding Scheme Designator, the Code Value, and the Code Meaning (a textual representation of the coded concept). See Sections 8.3 through 8.6 of this Part for the definition of optional and conditional Coded Entry Attributes.

Note: Structured data encoding with standardized coding schemes is widely used in computer-based patient records to enable selective retrieval of information. Many DICOM IODs specify Coded Entry Attributes. The semantics of the mandatory coded entry attributes are compatible with the ANSI HISPP Common Data Types and with the coded entry mechanisms of HL7 and CEN/TC 251 WG3 and WG4.

8.1 CODE VALUE

The Code Value (0008,0100) is a computer readable and computer searchable identifier that is unambiguous within the Coding Scheme denoted by Coding Scheme Designator (0008,0102) and Coding Scheme Version (0008,0103). The suggested Value Set, i.e. the Defined Terms, for a given instance of Code Value (0008,0100) may be defined by an external message/terminology Mapping Resource, such as the SNOMED DICOM Microglossary. See Sections 3.10, 8.4, 8.5, and Annex D of this Part for further explanation of message/terminology Mapping Resources.

Defined Terms may be specified by reference to either a Context Group or a Template defined by a Mapping Resource. A Context Group is denoted by a Context ID Number (CID). A Template is denoted by a Template ID Number (TID). A Context Group or Template that defines the suggested Value Set for a Code Sequence Attribute is, respectively, a Baseline Context Group or a Baseline Template. See Section 3.10 and Annex D of this Part for further explanation. A Baseline Context Group is denoted by a Baseline Context ID Number (Baseline CID). A Baseline Template is denoted by a Baseline Template ID Number (Baseline TID). The suggested Defined Terms for a Code Sequence Attribute may be specified by a Baseline Context ID Number or a Baseline Template ID Number in an Attribute Definition. A Context ID Number value conveyed by Context Identifier (0008,010F), if present, overrides the Baseline Context ID Number(s) and/or Baseline Template(s) and specifies the Value Set of Defined Terms for the instance of Code Value (0008,0100) in the same sequence Item. Unless otherwise specified, Baseline Context ID Numbers and Baseline Template ID Numbers in this Standard are defined by the SDM.

8.2 CODING SCHEME DESIGNATOR, CODING SCHEME VERSION, AND PRIVATE CODING SCHEME CREATOR UID

The Coding Scheme Designator (0008,0102), Coding Scheme Version (0008,0103), and Private Coding Scheme Creator UID (0008,010C) uniquely identify the table (Coding Scheme) where the Code Value (0008,0100) is linked to its Code Meaning (0008,0104). The Enomen field of the appropriate record from SNOMED DICOM Microglossary Context Group 167 shall provide the value of Coding Scheme Designator (0008,0102) except for private Coding Scheme Designators. Private Coding Scheme Designators shall be constructed as specified by the current version of the HL7 Standard. See Section 8.8 of this Part for specification of the conditions for use of Coding Scheme Version (0008,0103) and Private Coding Scheme Creator UID (0008,010C).

Notes: 1. Some of the commonly-used coding schemes in biomedical imaging are CPT-4, ICD-9CM, SNOMED International, LOINC, the ACR Findings Codes, BI-RADS, and the UMLS.

2. If more than one version of a Coding Scheme exists, the name of the issuing organization or unqualified name of the Coding Scheme is not sufficient to identify the Coding Scheme unambiguously. If the Coding Scheme is a private Coding Scheme, there is no way to ensure uniqueness of the Coding Scheme Designator. Section 8.8 of this Part specifies conditions for the use of Coding Scheme Version (0008,0103) and Private Coding Scheme Creator UID (0008,010C) to resolve these ambiguities.

3. SDM Context Group 167 specifies Coding Scheme Designators for Coding Schemes that are relevant to biomedical imaging. When a Coding Scheme Designator for exactly the same Coding Scheme and version is also defined in the Coding Scheme Designator table of the current version of the HL7 Standard, the HL7 Coding Scheme Designator is used.

4. Coding Scheme Version (0008,0103) is used when a Coding Scheme has multiple versions and the Coding Scheme Designator does not explicitly (or adequately) specify the version number. At the time of this writing, the HL7 Vocabulary SIG is proposing to add a Coding Scheme Version attribute to the next version of the HL7 Standard. The intention of the DICOM Committee is to specify unambiguous identification of Coding Schemes and to use HL7 Coding Scheme Designators wherever possible.

5. Examples (Informative):

HL7 Version 2.3 Coding Scheme Designator	Coding Scheme Version	Fully Qualified Name
SNM3	3.3	SNOMED International, Version 3.3
SNM3	3.4	SNOMED International, Version 3.4
LN	1.01	Logical Observation Identifier Names and Codes, Version 1.01 (Laboratory LOINC)

In previous versions of the DICOM Standard, a provisional Coding Scheme Identifier of "99SDM" was assigned to the SNOMED DICOM Microglossary. Subsequently changes in design details of the SDM have been made. The SDM is used as a message/terminology Mapping Resource rather than a Coding Scheme. A message/terminology Mapping Resource is a database of context-dependent Attribute Value Set specifications. The Semantic Types in the original SDM are now Concept Groups (i.e. Attribute Value Sets) identified by Context ID Numbers. The terms within the Context Groups may come from a variety of coding schemes (BI-RADS, ACR Findings Codes, CPT, ICD, READ), though the predominant ones for clinical data in biomedical imaging are currently SNOMED and LOINC codes.

Consequently, when a Coding Scheme Designator (0008,0102) of “99SDM” is encountered, it shall be treated as equivalent to “SNM3” for the purpose of interpreting Code Value (0008,0100).

Notes: 1. This is possible because all codes in the SNOMED DICOM Microglossary defined for use with coded entries in previous versions of the standard were defined in SNOMED International, Version 3.3

2. The creation of new objects with a Coding Scheme Designator (0008,0102) of “99SDM” is now deprecated.

A Coding Scheme Designator (0008,0102) of “99SDM” is defined to identify the SNM3 Coding Scheme unambiguously, hence the condition for inclusion of Coding Scheme Version (0008,0103) is explicitly not satisfied.

8.3 CODE MEANING

The Code Meaning (0008,0104) is human-readable text which is provided for the convenience of the readers of the Information Object.

For a particular Coding Scheme Designator (0008,0102) and Code Value (0008,0100), several alternative values for Code Meaning (0008,0104) may be defined (i.e. synonyms), even for the same nomenclature language (English, French, etc.). Even when no synonyms are present within

a single nomenclature, other nomenclatures may be in use (i.e. translations of the Coding Scheme into other languages). Hence the value of Code Meaning (0008,0104) shall never be used as a key, index or decision value, rather the combination of Coding Scheme Designator (0008,0102) and Code Value (0008,0100) may be used. Code Meaning (0008,0104) is a purely annotative, descriptive Attribute.

This does not imply that Code Meaning (0008,0104) can be filled with arbitrary free text. Only values defined by the Coding Scheme shall be used.

8.4 MAPPING RESOURCE

The value of Mapping Resource (0008,0105) denotes the message/terminology Mapping Resource that specifies:

1) The Context Group that specifies the Value Set, i.e. the Defined Terms, for Code Value (0008,0100) and Code Meaning (0008,0104) of a particular instance of a Code Sequence Attribute or Code Sequence Modifier Attribute; or
2) the Template(s) that specify the modifier properties, Context Groups, Observation Classes, and Relationships that apply to a particular instance of a Code Sequence Attribute or Code Sequence Modifier Attribute in a given clinical or operational context. See Annex D of this Part for further explanation. The Defined Terms for the value of Mapping Resource (0008,0105) shall be:

   "SDM"= "SNOMED DICOM Microglossary",
   "HL7V"= "HL7 Vocabulary",
   "TERMS" = "Terminology Resource for Message Standards", and
   "PRIVATE" = "Private Controlled Terminology Mapping Resource".

8.5 CONTEXT GROUP VERSION

Context Group Version (0008,0106) conveys the version date/time of the Context Group identified by Context Identifier (0008,010F), as specified by the standards body that maintains the Mapping Resource in which the Context Group is defined.

8.6 CONTEXT IDENTIFIER

The value of Context Identifier (0008,010F) identifies the Context Group defined by Mapping Resource (0008,0105) from which the values of Code Value (0008,0100) and Code Meaning (0008,0104) were selected or the Context Group defined by Mapping Resource (0008,0105) to which the Code Value (0008,0100) and Code Meaning (0008,0104) have been added as a private Context Group extension by Context Group Creator UID (0008,010E).

8.7 CODE SET EXTENSIONS

Code Set Extension Flag (0008,010B) may be used to designate a Code Value/Code Meaning pair as a private extension of a Coding Scheme or Context Group. Code Set Extension Creator UID (0008,010D) may be used to identify the person or organization who created an extension to a Context Group and/or Coding Scheme. Context Group Local Version (0008,0107) conveys an implementation-specific private version date/time of a Context Group that contains private code set extensions. See Section 8.8 of this Part for further definition.

Notes: 1. These Attributes provides the means for users to extend code sets conveniently, while preserving referential integrity with respect to the original Context Group Version. These

attributes also enable system administrators to track extensions so that they can be submitted to standards bodies as change proposals for controlled terminologies.

2. The locally-defined (private) value of Context Group Local Version (0008,0107) typically would be a more recent date than the standard value of Context Group Version (0008,0106) specified in the standard message/terminology Mapping Resource that defines the Context Group.

8.8 STANDARD ATTRIBUTE SETS FOR CODE SEQUENCE ATTRIBUTES

Table 8.8-1 specifies the default set of Attributes encapsulated in the Items of Code Sequence Attributes. These Attributes comprise the Code Sequence Macro.

The default specifications of this Section are overridden within the scope of a Sequence Item or Code Sequence Attribute or IOD by corresponding specifications defined within the scope of that Sequence Item or Code Sequence Attribute or IOD. Additional Attributes may also be specified by the instantiation of the macro.

The Basic Coded Entry Attributes fully define a Coded Entry. If it is desired to convey the list from which a code has been chosen, then the optional Enhanced Encoding Mode Attributes may also be sent.

Table 8.8-1 Common Attribute Set for Code Sequence Attributes (Invoked as "Code Sequence Macro")

Attribute Name	Tag	Type	Attribute Description
BASIC CODED ENTRY ATTRIBUTES			
>Code Value	(0008,0100)	1C	See Section 8.1. Required if a sequence item is present.
>Coding Scheme Designator	(0008,0102)	1C	See Section 8.2. Required if a sequence item is present.
>Coding Scheme Version	(0008,0103)	1C	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.
>Code Meaning	(0008,0104)	1C	See Section 8.3. Required if a sequence item is present.
ENHANCED ENCODING MODE			
>Context Identifier	(0008,010F)	3	See Section 8.6.
>Mapping Resource	(0008,0105)	1C	See Section 8.4. Required if Context Identifier (0008,010F) is present.
>Context Group Version	(0008,0106)	1C	See Section 8.5. Required if Context Identifier (0008,010F) is present.
>Code Set Extension Flag	(0008,010B)	3	Code Set Extension Flag (0008,010B) indicates whether the Code Value/Code Meaning pair encoded in Code Value (0008,0100) and Code Meaning (0008,0104) is a private extension of a Context Group and/or Coding Scheme. See Section 8.7 of this Part. Enumerated Values: "Y", "N" If Context Identifier (0008,010F) is present, then "Y" shall mean "The Code Value/Code Meaning pair is a private extension of the Context Group designated by Context Identifier (0008,010F)." If no value of Context Identifier (0008,010F) is present, then "Y" shall mean "The Code Value/Code Meaning pair is a private extension of the Coding Scheme designated by Coding Scheme Designator (0008,0102) and Coding Scheme Version (0008,0103).

>Context Group Local Version	(0008,0107)	1C	See Section 8.7. Required if the value of Code Set Extension Flag (0008,010B) is "Y". May also be present if the Context Group denoted by Context Identifier (0008,010F) contains private code set extensions.
>Private Coding Scheme Creator UID	(0008,010C)	3	Private Coding Scheme Creator UID (0008,010C) identifies the organization that created and/or maintains the private Coding Scheme used, if any. See Section 8.2.
>Code Set Extension Creator UID	(0008,010D)	1C	Code Set Extension Creator UID (0008,010D) identifies the person or organization who created an extension to a Coding Scheme or Context Group. See Section 8.7. Required if the value of Code Set Extension Flag (0008,010B) is "Y".

Item: In PS 3.3 Annex C, amend all of the following sections by removing the struckout text and inserting the underlined text (only the affected rows of tables are shown here):

C.2.3 Patient Demographic Module

Table C.2-3 defines the Attributes relevant to generally describing a patient.

Table C.2-3
PATIENT DEMOGRAPHIC MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Patient's Insurance Plan Code Sequence	(0010,0050)	A sequence that conveys the patient's insurance plan.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that presents the patient's insurance plan name.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-1 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The patient's insurance plan name that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.3.2 Visit Identification Module

Table C.3-2 defines the Attributes relevant to identifying a visit.

Table C.3-2
VISIT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Institution Code Sequence	(0008,0082)	A sequence that conveys the healthcare facility identification.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the healthcare facility name.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-1 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The healthcare facility name that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.3.4 Visit Admission Module

Table C.3-4 defines the Attributes relevant to admitting a patient during a visit.

Table C.3-4
VISIT ADMISSION MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Admitting Diagnosis Code Sequence	(0008,1084)	A sequence that conveys the admitting diagnosis.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the admitting diagnosis.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-1 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The admitting diagnosis that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.3.5 Visit Discharge Module

Table C.3-5 defines the Attributes relevant to the discharging of a patient from a visit.

Table C.3-5
VISIT DISCHARGE MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Discharge Diagnosis Code Sequence	(0038,0044)	A sequence that conveys the discharge diagnosis
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the discharge diagnosis.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-1 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The discharge diagnosis that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.4 Study Scheduling Module

Table C.4-4 defines the Attributes relevant to scheduling a study.

Table C.4-4
STUDY SCHEDULING MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Requested Procedure Code Sequence	(0032,1064)	A sequence that conveys the requested procedure.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the type of procedure requested.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~

~~>Code Meaning~~	~~(0008,0104)~~	~~The requested procedure that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.9 Study Component Acquisition Module

Table C.4-9
STUDY COMPONENT ACQUISITION MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Procedure Code Sequence	(0008,1032)	A sequence that conveys the (single) type of procedure performed.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the procedure performed.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The procedure performed that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.10 Scheduled Procedure Step Module

Table C.4-10
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
>Scheduled Action Item Code Sequence	(0040,0008)	Sequence describing the Scheduled Action Item(s) following a specified coding scheme. This sequence contains one or more Action Items.
~~>>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the type of Scheduled Action Item~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~The Scheduled Procedure Step that is represented by the Code Value (0008,0100)~~
>>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.11 Requested Procedure Module

Table C.4-11
REQUESTED PROCEDURE MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Requested Procedure Code Sequence	(0032,1064)	A sequence that conveys the Requested Procedure of one Procedure Type.

~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the type of Requested Procedure.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The requested procedure that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.13 Performed Procedure Step Relationship

Table C.4.13-1
PERFORMED PROCEDURE STEP RELATIONSHIP MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
>Scheduled Action Item Code Sequence	(0040,0008)	Sequence describing the Scheduled Action Item(s) following a specific coding scheme. This sequence contains one or more Action Items.
~~>>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the type of Scheduled Action Item.~~
~~>>Coding Scheme designator~~	~~(0008,0102)~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~The Scheduled Procedure Step that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.14 Performed Procedure Step Information

Table C.4.14-1
PERFORMED PROCEDURE STEP INFORMATION MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Procedure Code Sequence	(0008,1032)	A sequence that conveys the (single) type of procedure performed.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the procedure performed.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The procedure performed that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.15 Image Acquisition Results

Table C.4.15-1
IMAGE ACQUISITION RESULTS MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Performed Action Item Sequence	(0040,0260)	Sequence describing the Action Items performed for this Procedure Step. This sequence may have zero or more Items.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the type of Performed Action Item.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from Annex D designating the coding scheme that maps the Code Value onto the Code Meaning.~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The Action Item that is represented by the Code Value.~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.4.16 Radiation Dose

Table C.4.16-1
RADIATION DOSE MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Anatomic Structure, Space or Region Sequence	(0008,2229)	Anatomic structure, space or region that has been exposed to ionizing radiation. The sequence may have zero or one Items.
~~>Code Value~~	~~(0008,0100)~~	~~The code value that represents the anatomic region.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code value from Part 3 Annex D designating the coding scheme for anatomic regions that maps the Code Values onto the Code Meaning.~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The anatomic region that is represented by the Code Value.~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*

C.4.17 Billing and Material Management Codes

Table C.4.17-1
BILLING AND MATERIAL MANAGEMENT CODE MODULE ATTRIBUTES

Attribute name	Tag	Attribute Description
Billing Procedure Step Sequence	(0040,0320)	Contains billing codes for the Procedure Type performed within the Procedure Step. The sequence may have zero or more Items.
~~>Code Value~~	~~(0008,0100)~~	~~A code value (defined by the coding scheme) that represents information for billing.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~A designator for a coding scheme used for billing that maps the Code Values onto the Code Meaning.~~
~~>Code Meaning~~	~~(0008,0104)~~	~~Text description of the billing procedure represented by Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*
>Billing Item Sequence	(0040,0296)	Code values of chemicals, supplies or devices required for billing. The sequence may have zero or

		one Items.
~~>>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the chemicals or devices.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~The identification of a hospital selected coding scheme.~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~Text description of the chemical or device represented by Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*
>>Measuring Units Sequence	(0040,0295)	Unit of measurement. The sequence may have zero or one Items.
~~>>>Code Value~~	~~(0008,0100)~~	~~A code value (defined by the coding scheme) that represents information for the unit of measurement.~~
~~>>>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from PS 3.3 Annex D designating the coding scheme applied.~~
~~>>>Code Meaning~~	~~(0008,0104)~~	~~Text description of the unit of measurement represented by Code Value (0008,0100).~~
>>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 82.*

C.6.6 Interpretation Approval Module

Table C.6-6 defines the Attributes relevant to the approval of an interpretation.

Table C.6-6
INTERPRETATION APPROVAL MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Interpretation Diagnosis Codes Sequence	(4008,0117)	A sequence that conveys the interpretation diagnosis.
~~>Code Value~~	~~(0008,0100)~~	~~The code value (defined by the coding scheme) that represents the interpretation diagnosis.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~The code from table D-1 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)~~
~~>Code Meaning~~	~~(0008,0104)~~	~~The interpretation diagnosis that is represented by the Code Value (0008,0100)~~
>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*

C.7.3.1 General Series Module

Attribute Name	Tag	Type	Attribute Description
>Scheduled Action Item Code Sequence	(0040,0008)	3	Sequence describing the Scheduled Action Item(s) following a specific coding scheme. This sequence contains one or more Action

			Items.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the type of Scheduled Action Item. Required if Sequence Item is present.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Sequence Item is present.~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The Scheduled Procedure Step that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*	

C.7.6.4 Contrast/Bolus Module

Table C.7-10 specifies the Attributes that describe the contrast /bolus used in the acquisition of the Image.

Table C.7-10
CONTRAST/BOLUS MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Contrast/Bolus Agent Sequence	(0018,0012)	3	Sequence that identifies the contrast agent.
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the contrast agent. Required if Contrast/Bolus Agent Sequence (0018,0012) is sent. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Contrast Agent when the Coding Scheme Designator (0008,0102) is 99SDM~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Contrast/Bolus Agent Sequence (0018,0012) is sent.~~ ~~Defined Terms: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The contrast agent that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 12.*	
Contrast/Bolus Administration Route Sequence	(0018,0014)	3	Sequence that identifies the route of administration of contrast agent.

~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the contrast agent administration route. Required if Contrast/Bolus Administration Route Sequence (0018,0014) is sent. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Drug Administration Route when the Coding Scheme Designator (0008,0102) is 99SDM.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Contrast/Bolus Administration Route Sequence (0018,0014) is sent.~~ ~~Defined Terms: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The contrast agent administration route that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 11.*	
>Additional Drug Sequence	(0018,002A)	3	Sequence that identifies any additional drug that is administered with the contrast agent bolus.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the drug. Required if Additional Drug Sequence (0018,002A) is sent. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Interventional Drug when the Coding Scheme Designator (0008,0102) is 99SDM~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Additional Drug Sequence (0018,002A) is sent.~~ ~~Defined Terms: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The drug that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*No Baseline Context ID is defined.*	

C.7.6.12 Device

Table C.7-18 describes the Attributes of devices (e.g., catheters, markers, baskets) which are associated with a study and/or image.

Table C.7-18
DEVICE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Device Sequence	(0050,0010)	3	Introduces sequence of items describing devices used which may be visible in the image
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the device. Required if Device Sequence (0050,0010) is present. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Interventional Device when the Coding Scheme Designator (0008,0102) is 99SDM.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Device Sequence (0050,0010) is present.~~ ~~Defined Terms: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The device that is represented by the Code Value (0008,0100). May be present if Device Sequence (0050,0010) is present.~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 8.*	

~~Note: The value 99SDM from Annex D may be used for the Coding Scheme Designator pointing to SNOMED/DICOM Microglossary terms of semantic type Interventional Device. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.7.6.12.1 Device Attribute Descriptions

C.7.6.12.1.1 Device Type and Size

Depending on the type of device specified by the Code Value (0008,0100) in an item of the Device Sequence (0050,0010), various device size attributes (e.g., Device Length (0050,0014), Device Diameter (0050,0016), Device Volume (0050,0018), Inter Marker Distance (0050,0019)) may be required to fully characterize the device.

Note: For example, the ~~The~~ attributes required to fully characterize the devices in the SNOMED/DICOM Microglossary Angiographic Device list are specified in ~~that list~~ SDM Template # 23.

C.7.6.13 Therapy

Table C.7-19 describes the Attributes of therapies (e.g. interventions during an angiographic procedure) which are associated with a study and/or image.

Table C.7-19
THERAPY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Interventional Therapy Sequence	(0018,0036)	3	Introduces sequence of items describing interventional therapies
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the interventional therapy. Required if Interventional Therapy Sequence (018,0036) is present. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Interventional Procedure when the Coding Scheme Designator (0008,0102) is 99SDM.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Interventional Therapy Sequence (0018,0036) is present.~~ ~~Defined Terms: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The interventional therapy that is represented by the Code Value (0008,0100). May be present if Interventional Therapy Sequence (0018,0036) is present.~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 9.*	
>Interventional Drug Sequence	(0018,0029)	3	Sequence that identifies the interventional drug. May be present if Interventional Therapy Sequence (0018,0036) is present.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the interventional drug. Required if Interventional Drug Sequence (0018,0029) is present. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Interventional Drug when the Coding Scheme Designator (0008,0102) is 99SDM.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Interventional Drug Sequence (0018,0029) is present.~~ ~~Defined Terms: 99SDM~~

~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The interventional drug that is represented by the Code Value (0008,0100). May be present if Interventional Drug Sequence (0018,0029) is present.~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 10.*	
> Administration Route Code Sequence	(0054,0302)	3	Sequence that identifies the Administration Route. This sequence shall contain exactly one item.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the Administration Route. Required if Administration Route Code Sequence (0018,0027) is present. Values shall be taken from SNOMED/DICOM Microglossary terms of semantic type Drug Administration Route when the Coding Scheme Designator (0008,0102) is 99SDM.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Administration Route Code Sequence (0018,0027) is present.~~ ~~Defined Terms: 99SDM~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The Administration Route that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 11.*	

~~Note: The value 99SDM from Annex D may be used for the Coding Scheme Designator pointing to SNOMED/DICOM Microglossary terms of semantic type Interventional Procedure . It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.4.6 NM/PET Patient Orientation Module

Table C.8-5 specifies the Attributes that describe the NM/PET Patient Orientation.

Table C.8-5
NM/PET PATIENT ORIENTATION MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient Orientation Code Sequence	(0054,0410)	2	Sequence that describes the orientation of the patient with respect to gravity. See C.8.4.6.1.1 for further explanation.

~~> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the patient orientation. Required if a sequence Item is present.~~
~~> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Enumerated Value: 99SDM~~ ~~Required if a sequence Item is present.~~
~~> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The patient orientation that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 19.* *The Coding Scheme Designator (0008,0102) shall have an Enumerated Value of "99SDM" for historical reasons.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
> Patient Orientation Modifier Code Sequence	(0054,0412)	2C	Patient Orientation Modifier. Required if needed to fully specify the orientation of the patient with respect to gravity. See C.8.4.6.1.2 for further explanation.
~~>> Code value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the patient orientation modifier. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Enumerated Value: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The patient orientation modifier that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 20.* *The Coding Scheme Designator (0008,0102) shall have an Enumerated Value of "99SDM" for historical reasons.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
Patient Gantry Relationship Code Sequence	(0054,0414)	2	Sequence which describes the orientation of the patient with respect to the gantry. See section C.8.4.6.1.3 for further explanation.

~~> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the patient orientation with respect to the gantry. Required if a sequence Item is present.~~
~~> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Enumerated Value: 99SDM~~ ~~Required if a sequence Item is present.~~
~~> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The patient gantry relationship that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 21.* *The Coding Scheme Designator (0008,0102) shall have an Enumerated Value of "99SDM" for historical reasons.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	

~~Note: Patient Orientation Code Sequence (0054,0410), Patient Orientation Modifier Code Sequence (0054,0412), and Patient Gantry Relationship Code Sequence (0054,0414) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.4.6.1 NM/PET Patient Orientation Attribute Descriptions

C.8.4.6.1.1 Patient Orientation Code Sequence

The Patient Orientation Code Sequence (0054,0410) is used to describe the orientation of the patient with respect to gravity, and is independent of the position in the gantry. Only a single Item shall be permitted in this sequence.

~~The Coding Scheme Designator (0008,0102) for the Patient Orientation Code Sequence (0054,0410) shall be the SNOMED DICOM Microglossary. The Code Value (0008,0100) for the Patient Orientation Code Sequence (0054,0410) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "body position".~~

C.8.4.6.1.2 Patient Orientation Modifier Code Sequence

The Patient Orientation Modifier Code Sequence (0054,0412) is used to modify or enhance the orientation specified by Patient Orientation Code Sequence (0054,0410). Only a single Item shall be permitted in this sequence.

~~The Coding Scheme Designator (0008,0102) for the Patient Orientation Modifier Code Sequence (0054,0412) shall be the SNOMED DICOM Microglossary. The Code Value (0008,0100) for the Patient Orientation Modifier Code Sequence (0054,0412) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "body position modifier".~~

C.8.4.6.1.3 Patient Gantry Relationship Code Sequence

Patient Gantry Relationship Code Sequence (0054,0414) is used to describe the patient direction within the gantry, such as head-first or feet-first. When imaging the extremities, these directions are related to normal anatomic position.

Example: In normal anatomic position, the fingers point towards the feet.

Only a single Item shall be permitted in this sequence.

~~The Coding Scheme Designator (0008,0102) for the Patient Gantry Relationship Code Sequence (0054,0414) shall be the SNOMED DICOM Microglossary. The Code Value (0008,0100) for the Patient Gantry Relationship Code Sequence (0054,0414) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "patient gantry relationship".~~

C.8.4.9 NM Image Module

Table C.8-9 contains the Attributes that describe Nuclear Medicine Images.

Table C.8-9
NM IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Anatomic Region Sequence	(0008,2218)	3	Sequence of one Item that identifies the anatomic region of interest in this image (i.e. external anatomy, surface anatomy, or general region of the body). See Section C.8.4.9.1.5.
~~> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region. Required if a sequence Item is present.~~
~~> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
> Anatomic Region Modifier Sequence	(0008,2220)	3	Sequence of one or more Items that modifies the anatomic region of interest in this image (i.e. prone, supine, decubitus right). See Section C.8.4.9.1.5.

~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region modifier term. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
Primary Anatomic Structure Sequence	(0008,2228)	3	Sequence of one or more Items that identifies the primary anatomic structure of interest in this image. See Section C.8.4.9.1.6.
~~> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary anatomic structure. Required if a sequence Item is present.~~
~~> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
> Primary Anatomic Structure Modifier Sequence	(0008,2230)	3	Sequence of one or more Items that modifies the primary anatomic structure of interest in this image. See Section C.8.4.9.1.6.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic structure modifier term. Required if a sequence Item is present.~~

~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	

Note~~s~~: ~~1.~~ Image Date (0008,0023) and Image Time (0008,0033) are included in the General Image Module, Table C.7-7, whenever the images are temporally related. For this purpose, all NM Images are considered temporally related, so that these elements are included in an NM Image.

~~2. Anatomic Region Sequence (0008,2218), Anatomic Region Modifier Sequence (0008,2220), Primary Anatomic Structure Sequence (0008,2228), and Primary Anatomic Structure Modifier Sequence (0008,2230) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.4.9.1.5 Anatomic Region

The general region of the body (e.g. the anatomic region, organ, or body cavity being examined) may be identified by the Anatomic Region Sequence (0008,2218). Characteristics of the anatomic region being examined, such as its orientation relative to gravity (e.g. prone, supine, semi-erect), sub-region (e.g. medial, lateral, superior, inferior, lobe, quadrant), and laterality (e.g. right, left, both), and so on, may be refined by the Anatomic Region Modifier Sequence (0008,2220).

~~If the Coding Scheme Designator (0008,0102) for the Anatomic Region Code Sequence (0008,2218) is 99SDM, then the Code Value (0008,0100) for the Anatomic Region Code Sequence (0008,2218) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic region or structure".~~

~~If the Coding Scheme Designator (0008,0102) for the Anatomic Region Modifier Sequence (0008,2220) is 99SDM, then the Code Value (0008,0100) for the Anatomic Region Modifier Sequence (0008,2220) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic region modifier".~~

Note: These **Attribute~~Data Elements~~** allow the specification of the information encoded by the Body Part Examined (0018,0015) and Patient Position (0018,5100) Data Attributes (in the General Series Module) in a more robust, consistent way.

C.8.4.9.1.6 Primary Anatomic Structure

The specific anatomic structures of interest within the image (e.g. a particular artery within the anatomic region) is identified by the Primary Anatomic Structure Sequence (0008,2228).

Characteristics of the anatomic structure, such as its location (e.g. subcapsular, peripheral, central), configuration (e.g. distended, contracted), and laterality (e.g. right, left, both), and so on, may be refined by the Primary Anatomic Structure Modifier Sequence (0008,2230).

~~If the Coding Scheme Designator (0008,0102) for the Primary Anatomic Structure Sequence (0008,2228) is 99SDM, then the Code Value (0008,0100) for the Primary Anatomic Structure Sequence (0008,2228) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic region or structure".~~

~~If the Coding Scheme Designator (0008,0102) for the Primary Anatomic Structure Modifier Sequence (0008,2230) is 99SDM, then the Code Value (0008,0100) for the Primary Anatomic Structure Modifier Sequence (0008,2230) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic structure modifier".~~

Note: These **Attribute~~Data Element~~**s are intended to replace the Anatomic Structure (0008,2208) **Attribute~~Data Element~~**.

C.8.4.10 NM Isotope Module

Table C.8-10 contains Attributes that describe the isotope administered for the acquisition.

Table C.8-10
NM ISOTOPE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
> Radionuclide Code Sequence	(0054,0300)	2C	Sequence that identifies the radionuclide. This sequence shall contain exactly one item. ~~**See section C.8.4.10.1.3 for further explanation.**~~ Required if a sequence Item is present.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the radionuclide. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Enumerated Value: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The radionuclide that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 18.* *The Coding Scheme Designator (0008,0102) shall have an Enumerated Value of "99SDM" for historical reasons.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	

> Administration Route Code Sequence	(0054,0302)	3	Sequence that identifies the administration route for the radiopharmaceutical. This sequence shall contain exactly one item. ~~**See section C.8.4.10.1.4 for further explanation**~~
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the radiopharmaceutical route. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The radiopharmaceutical route that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 11.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
> Radiopharmaceutical Code Sequence	(0054,0304)	3	Sequence that identifies the radiopharmaceutical. This sequence shall contain exactly one item. ~~**See section C.8.4.10.1.10 for further explanation.**~~
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the radiopharmaceutical. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The radiopharmaceutical that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 25.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
>Intervention Drug Code Sequence	(0018,0029)	3	Sequence that identifies the intervention drug name. ~~**See section C.8.4.10.1.11 for further explanation.**~~

~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the intervention drug name. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The intervention drug that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 10.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
> Administration Route Code Sequence	(0054,0302)	3	Sequence that identifies the administration route for the intervention drug. This sequence shall contain exactly one item. ~~**See section C.8.4.10.1.4 for further explanation**~~
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the intervention drug route. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The intervention drug route that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 11.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	

~~Note: Radionuclide Code Sequence (0054,0300) and Administration Route Code Sequence (0054,0302) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

~~C.8.4.10.1.3 Radionuclide Code Sequence~~

~~The Coding Scheme Designator (0008,0102) for the Radionuclide Code Sequence (0054,0300) shall be the SNOMED DICOM Microglossary. The Code Value (0008,0100) for the Radionuclide Code Sequence (0054,0300) shall be the Source UID value from a SNOMED DICOM~~

~~Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "diagnostic radionuclide".~~

~~C.8.4.10.1.4 Administration Route Code Sequence~~

~~If the Coding Scheme Designator (0008,0102) for the Administration Route Code Sequence (0054,0302) is 99SDM, then the Code Value (0008,0100) for the Administration Route Code Sequence (0054,0302) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "drug administration route".~~

~~C.8.4.10.1.10 Radiopharmaceutical Code Sequence~~

~~If the Coding Scheme Designator (0008,0102) for the Radiopharmaceutical Code Sequence (0054,0304) is 99SDM, then the Code Value (0008,0100) for the Radiopharmaceutical Code Sequence (0054,0304) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "radiopharmaceutical agent".~~

~~C.8.4.10.1.11 Intervention Drug Code Sequence~~

~~If the Coding Scheme Designator (0008,0102) for the Intervention Drug Code Sequence (0018,0029) is 99SDM, then the Code Value (0008,0100) for the Intervention Drug Code Sequence (0018,0029) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "angio interventional drug".~~

C.8.4.11 NM Detector Module

Table C.8-11 contains IOD Attributes that describe Nuclear Medicine Detectors used to produce an image.

Table C.8-11
NM DETECTOR MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
> View Code Sequence	(0054,0220)	3	Sequence that describes the projection of the anatomic region of interest on the image receptor. See section C.8.4.11.1.7 for further explanation.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the view. Required if a sequence Item is present.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Term: 99SDM~~ ~~Required if a sequence Item is present.~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The view that is represented by the Code Value (0008,0100).~~

>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 26 .* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	
>> View Angulation Modifier Code Sequence	(0054,0222)	2C	View Modifier. Required if needed to fully specify the View. See section C.8.4.11.1.8 for further explanation.
~~>>> Code value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the view angulation modifier. Required if a sequence Item is present.~~
~~>>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code value (0008,0100) onto the Code Meaning (0008,0104).~~ ~~Defined Terms:~~ ~~99SDM~~ ~~Required if a sequence Item is present.~~
~~>>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The view modifier that is represented by the Code Value (0008,0100).~~
>>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 23.* *Code Meaning (0008,0104) shall be Type 3 for historical reasons.*	

~~Note: View Code Sequence (0054,0220) and View Angulation Modifier Code Sequence (0054,0222) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.4.11.1.7 View Code Sequence

Only a single Item shall be permitted in this sequence.

~~If the Coding Scheme Designator (0008,0102) for the View Code Sequence (0054,0220) is 99SDM, then the Code Value (0008,0100) for the View Code Sequence (0054,0220) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "imaging view".~~

C.8.4.11.1.8 View Angulation Modifier Code Sequence

Only a single Item shall be permitted in this sequence.

~~If the Coding Scheme Designator (0008,0102) for the View Angulation Modifier Code Sequence (0054,0222) is 99SDM, then the Code Value (0008,0100) for the View Angulation Modifier Code Sequence (0054,0222) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have a Source value of "SNMI", any Context value, and a Semantic Type value of "cranio-caudal angulation modifier".~~

C.8.5.6 US Image Module

Table C.8-18 specifies the Attributes that describe ultrasound images.

Table C.8-18
US IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Anatomic Region Sequence	(0008,2218)	3	Sequence of one Item that identifies the anatomic region of interest in this image (i.e. external anatomy, surface anatomy, or general region of the body). See Section C.8.5.6.1.17.
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region. Required if a sequence item is present.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*	
>Anatomic Region Modifier Sequence	(0008,2220)	3	Sequence of one or more Items that modifies the anatomic region of interest in this image (i.e. prone, supine, decubitus right). See Section C.8.5.6.1.17.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region modifier term. Required if a sequence item is present.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2 .*	
Primary Anatomic Structure Sequence	(0008,2228)	3	Sequence of one or more Items that identifies the primary anatomic structure of interest in this image. See Section C.8.5.6.1.18

~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary anatomic structure. Required if a sequence item is present.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*	
>Primary Anatomic Structure Modifier Sequence	(0008,2230)	3	Sequence of one or more Items that modifies the primary anatomic structure of interest in this image. See Section C.8.5.6.1.18
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic structure modifier term. Required if a sequence item is present.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.*	
Transducer Position Sequence	(0008,2240)	3	Sequence of one or more Items that identifies the transducer position used in this image. See section C.8.5.6.1.19.
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary transducer position. Required if a sequence item is present.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~

~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The transducer position that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 4.*	
> Transducer Position Modifier Sequence	(0008,2242)	3	Sequence of one or more Items that modifies the primary transducer position of interest in this image. See Section C.8.5.6.1.19.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the transducer position modifier term. Required if a sequence item is present.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The transducer position modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 5.*	
Transducer Orientation Sequence	(0008,2244)	3	Sequence of one or more Items that identifies the Transducer Orientation used in this image. See section C.8.5.6.1.20.
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary Transducer Orientation. Required if a sequence item is present.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The transducer orientation that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 6.*	
> Transducer Orientation Modifier Sequence	(0008,2246)	3	Sequence of one or more Items that modifies the primary Transducer Orientation of interest in this image. See Section C.8.5.6.1.20

~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the transducer orientation modifier term. Required if a sequence item is present.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if a sequence item is present.~~ ~~Defined Term: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The transducer orientation structure modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 7.*	

C.8.5.6.1.17 Anatomic Region Sequence

The general region of the body (e.g. the anatomic region, organ, or body cavity being examined) may be identified by the Anatomic Region Sequence (0008,2218). Characteristics of the anatomic region being examined, such as its orientation relative to gravity (e.g. prone, supine, semi-erect), sub-region (e.g. medial, lateral, superior, inferior, lobe, quadrant), and laterality (e.g. right, left, both), and so on, may be refined by the Anatomic Region Modifier Sequence (0008,2220).

~~If the Coding Scheme Designator (0008,0102) for the Anatomic Region Sequence (0008,2218) is 99SDM, then the Code Value (0008,0100) for the Anatomic Region Sequence (0008,2218) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic region or structure".~~

~~If the Coding Scheme Designator (0008,0102) for the Anatomic Region Modifier Sequence (0008,2220) is 99SDM, then the Code Value (0008,0100) for the Anatomic Region Modifier Sequence (0008,2220) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic region modifier".~~

Note: ~~1)~~ These **Attribute~~Data Element~~**s allow the specification of the information encoded by the Body Part Examined (0018,0015) and Patient Position (0018,5100) Data Attributes (in the General Series Module) in a more robust, consistent way.

~~2) Anatomic Region Sequence (0008,2218) and Anatomic Region Modifier Sequence (0008,2220) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.5.6.1.18 Primary Anatomic Structure Sequence

The specific anatomic structures of interest within the image (e.g. a particular artery within the anatomic region) is identified by the Primary Anatomic Structure Sequence (0008,2228). Characteristics of the anatomic structure, such as its location (e.g. subcapsular, peripheral, central), configuration (e.g. distended, contracted), and laterality (e.g. right, left, both), and so on, may be refined by the Primary Anatomic Structure Modifier Sequence (0008,2230).

~~If the Coding Scheme Designator (0008,0102) for the Primary Anatomic Structure Sequence (0008,2228) is 99SDM, then the Code Value (0008,0100) for the Primary Anatomic Structure Sequence (0008,2228) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic region or structure".~~

~~If the Coding Scheme Designator (0008,0102) for the Primary Anatomic Structure Modifier Sequence (0008,2230) is 99SDM, then the Code Value (0008,0100) for the Primary Anatomic Structure Modifier Sequence (0008,2230) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "anatomic structure modifier".~~

Note: ~~1)~~ These **Attribute~~Data Element~~**s are intended to replace the Anatomic Structure (0008,2208) **Attribute~~Data Element~~**.

~~2) Primary Anatomic Structure Sequence (0008,2228) and Primary Anatomic Structure Modifier Sequence (0008,2230) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.5.6.1.19 Transducer Position Sequence

~~If the Coding Scheme Designator (0008,0102) for the Transducer Position Sequence (0008,2240) is 99SDM, then the Code Value (0008,0100) for the Transducer Position Sequence (0008,2240) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "transducer position".~~

~~If the Coding Scheme Designator (0008,0102) for the Transducer Position Modifier Sequence (0008,2242) is 99SDM, then the Code Value (0008,0100) for the Transducer Position Modifier Sequence (0008,2242) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "transducer position modifier".~~

Note: ~~1)~~ These **Attribute~~Data Element~~**s are intended to replace the Transducer Position (0008,2200) **Attribute~~Data Element~~**.

~~2) Transducer Position Sequence (0008,2240), Transducer Position Modifier Code Sequence (0008,2242) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.5.6.1.20 Transducer Orientation Sequence

~~If the Coding Scheme Designator (0008,0102) for the Transducer Orientation Sequence (0008,2244) is 99SDM, then the Code Value (0008,0100) for the Transducer Orientation Sequence (0008,2244) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "transducer orientation".~~

~~If the Coding Scheme Designator (0008,0102) for the Transducer Orientation Modifier Sequence (0008,2246) is 99SDM, then the Code Value (0008,0100) for the Transducer Orientation Modifier Sequence (0008,2246) shall be the Source UID value from a SNOMED DICOM Microglossary record. This record shall have Source value of "SNMI", any Context value, and a Semantic Type value of "transducer orientation modifier".~~

Note: ~~1)~~ These **Attribute~~Data Element~~**s are intended to replace the Transducer Orientation(0008,2204) **Attribute~~Data Element~~**.

~~2) Transducer Orientation Sequence (0008,2244), Transducer Orientation Modifier Code Sequence (0008,2246) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.7.1 X-Ray Image Module

Table C.8-26
X-Ray Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
Anatomic Region Sequence	(0008,2218)	3	Sequence of one Item that identifies the anatomic region of interest in this image (i.e. external anatomy, surface anatomy, or general region of the body). This anatomic region is placed on the table for examination. See C.8.7.1.1.10.
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region. Required if Anatomic Region Sequence (0008,2218) is sent.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Anatomic Region Sequence (0008,2218) is sent.~~ ~~Defined Term: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region that is represented by the Code Value (0008,0100). May be present only if Anatomic Region Sequence (0008,2218) is sent.~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*	
>Anatomic Region Modifier Sequence	(0008,2220)	3	Sequence of one or more Items that modifies the anatomic region of interest in this image (i.e. prone, supine, decubitus right). May be present only if Anatomic Region Sequence (0008,2218) is sent. See C.8.7.1.1.10.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region modifier term. Required if Anatomic Region Modifier Sequence (0008,2220) is sent.~~

~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Anatomic Region Modifier Sequence (0008,2220) is sent.~~ ~~Defined Term: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region modifier term that is represented by the Code Value (0008,0100). . May be present only if Anatomic Region Modifier Sequence (0008,2220) is sent.~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.*	
Primary Anatomic Structure Sequence	(0008,2228)	3	Sequence of one or more Items that identifies the primary anatomic structure of interest in this image. See C.8.7.1.1.11.
~~>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary anatomic structure. Required if Primary Anatomic Structure Sequence (0008,2228) is sent.~~
~~>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Primary Anatomic Structure Sequence (0008,2228) is sent.~~ ~~Defined Term: 99SDM~~
~~>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure that is represented by the Code Value (0008,0100). May be present only if Primary Anatomic Structure Sequence (0008,2228) is sent.~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*	
>Primary Anatomic Structure Modifier Sequence	(0008,2230)	3	Sequence of one or more Items that modifies the primary anatomic structure of interest in this image. May be present only if Primary Anatomic Structure Sequence (0008,2228) is sent. See C.8.7.1.1.11.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic structure modifier term. Required if Primary Anatomic Structure Modifier Sequence (0008,2230) is sent.~~

~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Primary Anatomic Structure Modifier Sequence (0008,2230) is sent.~~ ~~Defined Term: 99SDM~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure modifier term that is represented by the Code Value (0008,0100). May be present only if Primary Anatomic Structure Modifier Sequence (0008,2230) is sent.~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.*	

C.8.7.1.1.10 Anatomic Region

The general region of the body (e.g. the anatomic region, organ, or body cavity being examined) may be identified by the Anatomic Region Sequence (0008,2218). Characteristics of the anatomic region being examined, such as its orientation relative to gravity (e.g. prone, supine, semi-erect), sub-region (e.g. medial, lateral, superior, inferior, lobe, quadrant), and laterality (e.g. right, left, both), and so on, may be refined by the Anatomic Region Modifier Sequence (0008,2220). These sequences utilize ~~coding triplet encoding~~ coded entry data to reference anatomic and modifier terms from a Coding Scheme (e.g. SNOMED).

~~Code Values (0008,0100) for the Anatomic Region Sequence (0008,2218) shall be selected from the SNOMED/DICOM Microglossary terms of semantic type Anatomic Region or Structure Topography module when the Coding Scheme Designator (0008,0102) is 99SDM.~~

~~Code Values (0008,0100) for the Anatomic Region Modifier Sequence (0008,2220) shall be selected from the SNOMED/DICOM Microglossary terms of semantic type Anatomic Region Modifier General Linkage/Modifiers module when the Coding Scheme Designator (0008,0102) is 99SDM.~~

Note: These **Attribute~~Data Element~~**s allow the specification of the information encoded by the Body Part Examined (0018,0015) and Patient Position (0018,5100) Data Attributes (in the General Series Module) in a more robust, consistent way.

C.8.7.1.1.11 Primary Anatomic Structure

The specific anatomic structures of interest within the image (e.g. a particular artery within the anatomic region) is identified by the Primary Anatomic Structure Sequence (0008,2228). Characteristics of the anatomic structure, such as its location (e.g. subcapsular, peripheral, central), configuration (e.g. distended, contracted), and laterality (e.g. right, left, both), and so on, may be refined by the Primary Anatomic Structure Modifier Sequence (0008,2230). These sequences utilize ~~triplet encoding~~ coded entry data to reference anatomic and modifier terms from a Coding Scheme (e.g. SNOMED).

~~Code Values (0008,0100) for the Primary Anatomic Structure Sequence (0008,2228) shall be selected from the SNOMED/DICOM Microglossary terms of semantic type Anatomic Region or Structure Topography module when the Coding Scheme Designator (0008,0102) is 99SDM.~~

~~Code Values (0008,0100) for the Primary Anatomic Structure Modifier Sequence (0008,2230) shall be selected from the SNOMED/DICOM terms of semantic type Anatomic Structure Modifier~~

~~Microglossary General Linkage/Modifiers module when the Coding Scheme Designator (0008,0102) is 99SDM.~~

Note: These **Attribute~~Data Element~~**s are intended to replace the Anatomic Structure (0008,2208) **Attribute~~Data Element~~**.

C.8.8.8 RT ROI Observations Module

The RT ROI Observations module specifies the identification and interpretation of an ROI specified in the Structure Set and ROI Contour modules.

Table C.8.8.8-1 RT ROI Observations Module

Attribute Name	Tag	Type	Attribute Description
>RT ROI Identification Code Sequence	(3006,0086)	3	Introduces sequence containing Code used to identify ROI. If this sequence is included, only one item shall be present.
~~>>Code Value~~	~~(0008,0100)~~	~~1C~~	~~Identifier within Coding Scheme which identifies ROI. Required if RT ROI Identification Code Sequence (3006,0086) is sent. See PS 3.3 Section 5.3 for further explanation.~~
~~>>Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~Uniquely identifies the table (Coding Scheme) where the Code Value (0008,0100) is linked to its Code Meaning (0008,0104). Required if RT ROI Identification Code Sequence (3006,0086) is sent. See PS 3.3 Section 5.3 for further explanation.~~
~~>>Code Meaning~~	~~(0008,0104)~~	~~3~~	~~Human readable text interpretation of Code Value (0008,0100). See PS 3.3 Section 5.3 for further explanation.~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 96.*	

C.8.9.2 PET Isotope Module

Table C.8.9.2-1 contains IOD Attributes that describe a PET Isotope.

Table C.8.9.2-1 - PET Isotope

Attribute Name	Tag	Type	Attribute Description
> Radionuclide Code Sequence	(0054,0300)	2	Sequence that identifies the radionuclide. This sequence shall contain exactly one item. See section C.8.4.10.1.3 for explanation.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the radionuclide. Required if Radionuclide Code Sequence (0054,0300) is sent.~~

~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Radionuclide Code Sequence (0054,0300) is sent.~~ ~~Defined Terms: 99SDM~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The radionuclide that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is4020.*	
> Administration Route Code Sequence	(0054,0302)	3	Sequence that identifies the administration route of the radiopharmaceutical. This sequence shall contain exactly one item. See section C.8.4.10.1.4 for explanation.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the radiopharmaceutical route. Required if Administration Route Code Sequence (0054,0302) is sent.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Administration Route Code Sequence (0054,0302) is sent.~~ ~~Defined Terms: 99SDM~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The radiopharmaceutical route that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 11.*	
> Radiopharmaceutical Code Sequence	(0054,0304)	3	Sequence that identifies the radiopharmaceutical. This sequence shall contain exactly one item.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the radiopharmaceutical. Required if Radiopharmaceutical Code Sequence (0054,0304) is sent.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Radiopharmaceutical Code Sequence (0054,0304) is sent.~~ ~~Defined Terms: 99SDM~~

~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The radiopharmaceutical that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 4021.*	
> Intervention Drug Code Sequence	(0018,0029)	3	Sequence that identifies the intervention drug name.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the intervention drug name. Required if Intervention Drug Code Sequence (0018,0029) is sent.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Intervention Drug Code Sequence (0018,0029) is sent.~~ ~~Defined Terms: 99SDM~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The intervention drug that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is10.*	

~~Note: Radionuclide Code Sequence (0054,0300) and Radiopharmaceutical Route Code Sequence (0054,0302) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

C.8.9.4 PET Image Module

Table C.8.9.4-1 contains IOD Attributes that describe PET images.

Table C.8.9.4-1 - PET Image

Attribute Name	Tag	Type	Attribute Description
Anatomic Region Sequence	(0008,2218)	3	Sequence of one Item that identifies the anatomic region of interest in this image (i.e. external anatomy, surface anatomy, or general region of the body). See Section C.8.4.9.1.5.
~~> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region. Required if Anatomic Region Sequence (0008,2218) is sent.~~
~~> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Anatomic Region Sequence (0008,2218) is sent.~~ ~~Defined Terms: 99SDM~~
~~> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*	
> Anatomic Region Modifier Sequence	(0008,2220)	3	Sequence of one or more Items that modify the anatomic region of interest in this image (i.e. prone, supine, decubitus right). See Section C.8.4.9.1.5.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the anatomic region modifier term. Required if Anatomic Region Modifier Sequence (0008,2220) is sent.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Anatomic Region Modifier Sequence (0008,2220) is sent.~~ ~~Defined Terms: 99SDM~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic region modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.*	

Primary Anatomic Structure Sequence	(0008,2228)	3	Sequence of one or more Items that identifies the primary anatomic structure of interest in this image. See Section C.8.4.9.1.6.
~~> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary anatomic structure. Required if Primary Anatomic Structure Sequence (0008,2228) is sent.~~
~~> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Primary Anatomic Structure Sequence (0008,2228) is sent.~~ ~~Defined Terms: 99SDM~~
~~> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure that is represented by the Code Value (0008,0100).~~
>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 1.*	
> Primary Anatomic Structure Modifier Sequence	(0008,2230)	3	Sequence of one or more Items that modify the primary anatomic structure of interest in this image. See Section C.8.4.9.1.6.
~~>> Code Value~~	~~(0008,0100)~~	~~1C~~	~~The code value (defined by the coding scheme) that represents the primary anatomic structure modifier term. Required if Primary Anatomic Structure Modifier Sequence (0008,2230) is sent.~~
~~>> Coding Scheme Designator~~	~~(0008,0102)~~	~~1C~~	~~The code from Annex D designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104). Required if Primary Anatomic Structure Modifier Sequence (0008,2230) is sent.~~ ~~Defined Terms: 99SDM~~
~~>> Code Meaning~~	~~(0008,0104)~~	~~3~~	~~The anatomic structure modifier term that is represented by the Code Value (0008,0100).~~
>>Include 'Code Sequence Macro' Table 8.8-1		*Baseline Context ID is 2.*	

~~Note: Anatomic Region Sequence (0008,2218), Anatomic Region Modifier Sequence (0008,2220), Primary Anatomic Structure Sequence (0008,2229), and Primary Anatomic Structure Modifier Sequence (0008,2230) specify value 99SDM from Annex D for Coding Scheme Designator. It is expected that this value will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

Editorial Note.

The following text, proposed to replace the existing Annex D explains the DICOM coded-entry specifications, the new mechanism for publishing Coding Scheme Designators, and the differences between the 1995 and 1997 referencing-style for SDM Context Groups.

Annex D of PS 3.3-1996 is outdated and obsolete. It contains references to names, phone numbers, and addresses that are volatile information. Significant updates of coding schemes since 1993 are not reflected in the tables of the Annex. However, the Annex can be revised only by ballot. Since an accurate, current list of coding-scheme designators is essential to implementors of the Standard, the Coding Scheme Designators are now published in the SNOMED DICOM Microglossary where the list can be maintained on a regular basis. The Context ID Number is 167. See Section 8 for further description.

The SNOMED DICOM Microglossary is available via WWW from the College of American Pathologists SNOMED Home Page: http://www.snomed.org/sdm/sdm.htm

Item: Replace the existing PS 3.3 Annex D:

~~Annex D Coding Scheme Designators (Normative)~~

~~The ANSI HISPP MSDS supports the development of an international health care coding scheme registration authority. The types of coding schemes registered are Diagnostic, Procedure Observation, Drug ID, and Health Outcomes Coding Schemes. Locally defined coding schemes are also supported. Tables D-1 and D-2 identify the allowable Coding Schemes which shall be used when encoding a Coded Entry.~~

~~Note: The ANSI HISPP MSDS tables are chosen as an interim source of Coding Scheme Designators. It is expected that these tables will evolve when Coding Scheme Designator UIDs are available from a registration authority.~~

~~Table D-1~~
~~DIAGNOSTIC CODING SCHEMES~~

~~Names~~	~~Code~~	~~Source~~
~~American College of Radiology Index for Radiological Diagnosis~~	~~ACR~~	~~Index for Radiological Diagnosis Revised, 3rd Edition 1986, American Radiology finding codes. College of Radiology, Reston, VA.~~
~~CEN ECG diagnostic codes~~	~~CE~~	~~CEN PT007. A quite comprehensive set of codes (abbreviations) and descriptions codes published as a pre-standard by CEN TC251. Available from CEN TC251 secretariat, c/o Georges DeMoor, State University Hospital Gent, De Pintelaan 185 5K3, 9000 Gent, Belgium or Jos Willems, University of Gathuisberg, 49 Herestraat, 3000 Leuven, Belgium.~~
~~EUCLIDES~~	~~E~~	~~Available from Euclides Foundation International nv, Excelsiorlaan 4A, B-1930 Zaventem, Belgium; Phone: 32 2 720 90 60.~~
~~ICD9~~	~~I9~~	~~World Health Publications, Albany, NY.~~

ICD9-CM	I9C	Commission on Professional and Hospital Activities, 1968 Green Rd., Ann Arbor, MI 48105.
ICD-10	I10	World Health Publications, Albany, NY.
Local general code	99zzz	Locally defined codes for purpose of sender or receiver. Local codes can be identified by L (for backward compatibility) or 99zzz (where z is an alphanumeric character).
Local billing code	LB	Local billing codes/names (with extensions if needed).
Read Classification	RC	The Read Clinical Classification of Medicine, Park View Surgery, 26 Leicester Rd., Loughborough LE11 2AG (includes drug procedure and other codes, as well as diagnostic codes).
Systematized Nomenclature of Medicine (SNOMED)	SNM	Systematized Nomenclature of Medicine, 2nd Edition 1984 Vols 1, 2, College of American Pathologists, 325 Waukegan Road, Northfield IL 60093-2750.
SNOMED III	S3	See above (about to be released).
SNOMED/DICOM Microglossary	99SDM	SNOMED Project Manager, College of American Pathologists, 325 Waukegan Road, Northfield IL 60093-2750.
Unified Medical Language	UML	National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894.

Table D-2
PROCEDURE OBSERVATION/DRUG ID/HEALTH OUTCOMES CODING SCHEMES

Coding System	**Code**	**Source/Description**
ASTM	AS4	American Society for Testing & Materials and CPT4 (see Appendix A of ASTM E1238 and its codes revisions).
Universal		
CPT-4	C4	American Medical Association, P O Box 10946, Chicago, IL 60610.
CPT-5	C5	(under development - same contact as above)
EUCLIDES	E	AFP codes. Available from Euclides Foundation International nv, Excelsiorlaan 4A, B-1930 Zaventem, Belgium; Phone: 32-2-720-90-60.
FDA K10	FDK	Dept. of Health & Human Services, Food & Drug Administration, Rockville, MD 20857. (device & analyte process codes).
HIBCC	HB	Health Industry Business Communications Council, 5110 N. 40th St., Ste 120, Phoenix, AZ 85018.
ICCS	ICS	Commission on Professional and Hospital Activities, 1968 Green Road, Ann Arbor, MI 48105.

ICD-9CM	I9C	Commission on Professional and Hospital Activities, 1968 Green Road, Ann Arbor, MI 48105 (includes all procedures and diagnostic tests).
ISBT	IBT	International Society of Blood Transfusion. Blood Group Terminology "1990". VOX Sanquines 1990 58(2):152-169.
IUPAC/IFCC	IUC	Recommendations of Quantities and Units in Clinical Chemistry DRAFT (to be published in 1992). Henrik Olesen, M.D., D.M.Sc., Chairperson, Department of Clinical Chemistry, KK76.4.2, Rigshospitalet, University Hospital of Copenhagen, DK-2200, Copenhagen.
Local	99zzz	Locally defined codes for purpose of sender or receiver. If multiple local codes exist, the format should be 99zzz, or L where z is an alphanumeric character.
Medicare	MCR	Medicare billing codes/names.
Medicaid	MCD	Medicaid billing codes/names.
UCDS	UC	Uniform Clinical Data Systems. Ms. Michael McMullan, Office of Peer Review Health Care Finance Administration, The Meadows East Bldg., 6325 Security Blvd., Baltimore, MD 21207; (301) 966-6851.
Japanese Chemistry	JC8	Clinical examination classification code. Japan Association of Clinical Pathology. Version 8, 1990. A multiaxial code. including a subject code (e.g., Rubella = 5f395, identification code (e.g., virus ab IGG), a specimen code (e.g., serum = 023) and a method code (e.g., ELISA = 022)
Health Outcomes	HI	Health Outcomes Institute codes for outcome variables available (with responses) from Health Outcomes Institute, 2001 Killebrew Drive, Suite 122, Bloomington, MN 55425; (612) 858-9188. See examples in Appendix A.
Euclides Lab method codes	E6	Available from Euclides Foundation International nv, Excelsiorlaan 4A, B-1930 Zaventem, Belgium; Phone: 32-2-720-90-60.
Euclides Lab equipment codes	E7	Available from Euclides Foundation International nv (see above)
Euclides kind of quantity codes	E5	Available from Euclides Foundation International nv (see above)
Drug codes:		
Chemical abstract codes	CAS	These include unique codes for each unique chemical, including all generic drugs. The codes do not distinguish among different dosing forms. When multiple equivalent CAS numbers exist, use the first one listed in USAN. USAN 1990 and the USP dictionary of drug names, William M. Heller, Ph.D., Executive Editor, United States Pharmacopeial Convention, Inc., 12601 Twinbrook Parkway, Rockville, MD 20852.

National drug codes	NDC	These provide unique codes for each distinct drug, dosing form, manufacturer, and packaging. (Available from the National Drug Code Directory, FDA, Rockville, MD, and other sources.)
WHO rec# drug codes	W1 W2	World Health organization record number code. A unique sequential number is assigned to each unique single component drug and to each multi-component drug. Eight digits are allotted to each such code, six to identify the active agent, and 2 to identify the salt, of single content drugs. Six digits are assigned to each unique combination of drugs in a dispensing unit. The six digit code is identified by W1, the 8 digit code by W2.
WHO rec#	W4	With ASTM extensions (see appendix A of ASTM 1238-91), the WHO codes can be used to report serum (and other) levels, patient compliance with ASTM ext. with drug usage instructions, average daily doses and more (see Appendix A of ASTM 1238-91)
WHO ATC	WC	WHO's ATC codes provide a hierarchical classification of drugs by therapeutic class. They are linked to the record number codes listed above.
Note ¾ — The Read and NLM codes in Table D-1 also include drugs. A number of sources of unique drug names exist: British Approved Names (BAN), French-approved non proprietary names (DCF), and International Nonproprietary name (INN). These sources are now being reviewed. Those that also provide unique codes will be added to the "registry" of coding systems, using the abbreviations given in parentheses.		
Device Code		
MDNS	UMD	Universal Medical Device Nomenclature System. ECRI, 5200 Butler Pike, Plymouth Meeting, PA 19462 USA. Phone: 215-825-6000, Fax: 215-834-1275.

Item: Replace PS 3.3 Annex D with the following text:

Annex D (Informative): Codes and Controlled Terminology

D.1 BASIC CODED ENTRY

Coded entry can streamline reporting by reducing the need for text entries. However, the most valuable long term benefit of controlled terminology is improved information retrieval. For example, when the user at some future date needs to retrieve all cases of intermittently bleeding gastric ulcers, the query in a structured observations database will be far more effective than in either a paper record system or a full text computerized reporting system where descriptions may have completely arbitrary content.

Code Sequence Attributes support the interchange of coded information, such as controlled terminology, procedure codes, or diagnosis codes in messages specified by this Standard. Section 8 specifies a set of Coded Entry Attributes of which Code Sequence Attributes are constructed.

PS 3.3-1996 defined a Basic Mode of Semantic Description in which Code Sequence Attributes using a basic mechanism (three Coded Entry Attributes: Coding Scheme, Code Value, Code Meaning) plus the optional Coding Scheme Version (0008,0103) to convey discrete units of coded information. See Table D.1-1. The basic mechanism allows a user to select a code, designated by Code Value (0008,0100), from a specified list of codes (Coding Scheme), designated by Coding Scheme Designator (0008,0102). The first 64 characters of the textual representation of the meaning of Code Value (0008,0100) could optionally be conveyed by Code Meaning (0008,0104). Since PS 3.3-1998, Code Meaning (0008,0104) is required.

Table D.1-1. Basic Coded Entry Attributes

Section	Attribute Name	Tag
8.1	Code Value	(0008,0100)
8.2	Coding Scheme Designator	(0008,0102)
8.2	Coding Scheme Version	(0008,0103)
8.3	Code Meaning	(0008,0104)

This set of coded entry Attributes supports the basic representation of any coded concept from any coding scheme, including locally defined coding schemes. The coding scheme and code value Attributes are necessary for basic interchange of coded entry data. However, the Basic Mode of Semantic Description does not provide mechanisms to: 1) Represent the semantic relationships among encoded concepts, 2) constrain the set of relationships applicable to specified concepts or 3) constrain the Value Set of Attributes. The Extended Mode of Semantic Description is specified to provide these three semantic functions. See Sections D.3 and D.4 for further description of the Extended Mode of Semantic Description.

D.2 MESSAGE/TERMINOLOGY MAPPING RESOURCES

To obtain the maximum benefit (accuracy, precision, reduction of ambiguity) of controlled terminology for description of complex concepts, such as anatomy and morphology, additional descriptive power is needed. This need for additional descriptive power is met by the extended set of Code Sequence Attributes. The enhanced mode of semantic description defined in

Section 8 allows the sender to specify a Message Standard-to-Lexicon Mapping Resource for specification of the mapping of the concepts from one or more Lexicons (controlled terminology resources) to Coded Entry Attributes. A Mapping Resource is a controlled terminology resource that defines semantic Relationship Types, constrains the set of relationships applicable to specified concepts, and constrains the Value Set of Attributes under specified conditions.

Three terminology resources are specified as the preferred Mapping Resources for the DICOM Standard: The SNOMED DICOM Microglossary (SDM: Systematized Nomenclature of Human and Veterinary Medicine DICOM Microglossary), the HL7 Vocabulary (HL7V), and the Terminology Resource for Message Standards (TeRMS). In addition to the preferred Mapping Resources, DICOM also supports the use of locally defined Mapping Resources. The content of these Mapping Resources is defined by the professional groups that are acknowledged experts in a particular subject area. The SDM is the DICOM/SNOMED subset of the TeRMS Mapping Resource.

Previous versions of the DICOM Standard used the value 99SDM as a Coding Scheme Designator referring to the SNOMED DICOM Microglossary (message/terminology Mapping Resource) created in 1995. In some cases, the use of 99SDM was required as an Enumerated Value. Generally, wherever the value 99SDM was mentioned as a Coding Scheme Designator there was also a note mentioning that it was expected to be replaced when an appropriate authority for registering these designators is available. The symbol SDM is used to represent the SNOMED DICOM Microglossary in the Mapping Resource Attribute. Coding Scheme Designator values represent the source terminology standard. 99SDM is no longer specified for Coding Scheme Designator.

The notion of Semantic Type in the 1995 SNOMED DICOM Microglossary has been replaced by the notion of Concept Groups which are referred to by Context Group Identifiers (CIDs). In addition, the SNOMED DICOM Microglossary is now referred to as a Mapping Resource, which links Context Group Identifiers to Pick Lists of coded terms. The terms within the Pick Lists may come from a variety of coding schemes, though the predominant schemes are expected to be SNOMED, LOINC, and BI-RADS. Each record within a Context Group includes the designator for the source coding scheme drawn from the list of coding schemes included in the SDM. The lists of terms in the original SNOMED DICOM Microglossary defined for and utilized by several current DICOM Information Object Definitions have been transferred intact to the new format as Context Groups, and have been given Context ID numbers.

The IODs defined in previous versions of the DICOM Standard have been revised to accommodate the notion of Mapping Resource and to support the new “pick list” referencing mechanism. The requirements or recommendations to use particular Semantic Types to derive lists from which Code Values are chosen (“picked”) have been transformed into references to the appropriate Context ID in the new revision of the SDM. When a Code Value is selected from a Context Group in the revised SDM, the Coding Scheme Designator for that Code Value will be the source terminology designator listed in the SDM record to allow for the different coding schemes referenced by the SDM. The use of 99SDM has been retired and is now deprecated, though its meaning is defined.

As an example of how specific code sequences have changed, consider the Radionuclide Code Sequence (0054,0300) used in the Nuclear Medicine Isotope Module. Previously its description stated that the Code Value should be drawn from the Semantic Type value of diagnostic radionuclide. It has been revised to state that the Code Value shall be drawn from the SDM Context Group identified by Context ID 18. Within that Context Group are the same terms that were previously in the “diagnostic radionuclide” Semantic Type.

The new mechanism does not invalidate existing implementations. The same lists of terms are used, with different means used to identify them.

The Value Set (domain) of an Attribute defines the full meaning of an Attribute. An important goal of the Mapping Resource is to increase the likelihood that systems will share a common understanding of the full meaning of shared concepts by explicitly defining the value set of Coded Entry Attributes. Therefore, one of the functions of a Mapping Resource is to specify recommended Attribute Value Sets (baseline Defined Terms) for Coded Entry Attributes. Coded Entry Attribute Value Sets are specified in tables (Context Groups).

Attribute Value Sets from Mapping Resources are typically specified as Defined Terms rather than as Enumerated Values in this Standard, so that the lists can be modified locally if necessary, without violation of DICOM conformance. However, it is hoped that the community will contribute to the definition of Context Groups and will adopt the generally accepted ones whenever possible, rather than “re-inventing the wheel”.

With the SDM, HL7V, or TeRMS Mapping Resources, this Standard can reuse externally-captured and maintained domain knowledge. Without these Mapping Resources, the definitions of the full value set of all the Modifier Properties would need to be developed and maintained by the DICOM Standard Committee in order to support structured encoding of commonly used concepts, such as morphology. This would require a heavy expenditure of time and effort and would require a vast enlargement of the DICOM specification. Changes would be frequent and any update of a single term or phrase would require re-ballot of Parts of the DICOM Standard. Thus, the DICOM Standard Committee has entered into a joint development relationship with the College of American Pathologists (CAP) to ensure that the SDM Mapping Resource is comprehensive. The DICOM Standard Committee also collaborates with HL7 in the development of the HL7 Vocabulary. The intention of both groups is the develop mutually compatible controlled terminology resources.

Since an accurate, current list of Coding Scheme Designators is essential to implementors of the Standard, the Coding Scheme Designators are published in the SNOMED DICOM Microglossary (in the Enomen field) and updated on a regular basis. The Context ID Number is 167. SDM Context Group 167 contains a subset of the Coding Scheme Designators table of the current Version of HL7. The intention of the DICOM Standard Committee is to ensure that systems mediated by HL7 and the DICOM Standard utilize the same Coding Scheme Designators for identical Coding Schemes and Versions.

The SNOMED DICOM Microglossary can be obtained by WWW from the College of American Pathologists SNOMED Home Page: *http://www.snomed.org/sdm/sdm.htm.*

D.3 ENHANCED ENCODING MODE

The Extended Coded Entry Attributes allow a Code Sequence to convey from which list of codes a code was selected (“picked”).

Sections 8.4 through 8.6 specify the Coded Entry Attributes that may be used to convey additional semantic description of coded concepts in the Sequence Items of Code Sequence Attributes. Sections 8.7 and 8.8 specify the Extended Mode of Semantic Description. The Extended Mode Code Sequence Attributes in conjunction with a Mapping Resource (e.g. SDM, HL7V, or TeRMS) and an SDM aware message template provide enhanced descriptive power for complex concepts. Table D.3-1 shows the extended set of Coded Entry Attributes.

Table D.3-1. Extended Coded Entry Attributes

Section	Attribute Name	Tag
8.4	Mapping Resource	(0008,0105)
8.5	Context Group Version	(0008,0106)
8.7	Context Group Local Version	(0008,0107)
8.6	Context Identifier	(0008,010F)
8.2	Private Coding Scheme Creator UID	(0008,010C)
8.7	Code Set Extension Flag	(0008,010B)
8.7	Code Set Extension Creator UID	(0008,010D)

Context Identifier (0008,010F), Mapping Resource (0008,0105), and Context Group Version (0008,0106) uniquely designate the context dependent Value Set from which the coded value was selected. If a private Coding Scheme is used, the Private Coding Scheme Creator UID (0008,010C) may also be specified. These Attributes preserve the semantic context of the value conveyed in Code Value (0008,0100). Preservation of the original clinical or operational encoding context is valuable because medical knowledge and natural language evolve constantly. Two illustrative examples are provided in the following paragraph.

Example 1: An early version of the SDM might list two modifier properties for the morphology of a neoplastic mass. A later version, modified subsequent to further research and increased knowledge of that type of neoplasm, might include three or four modifier properties.

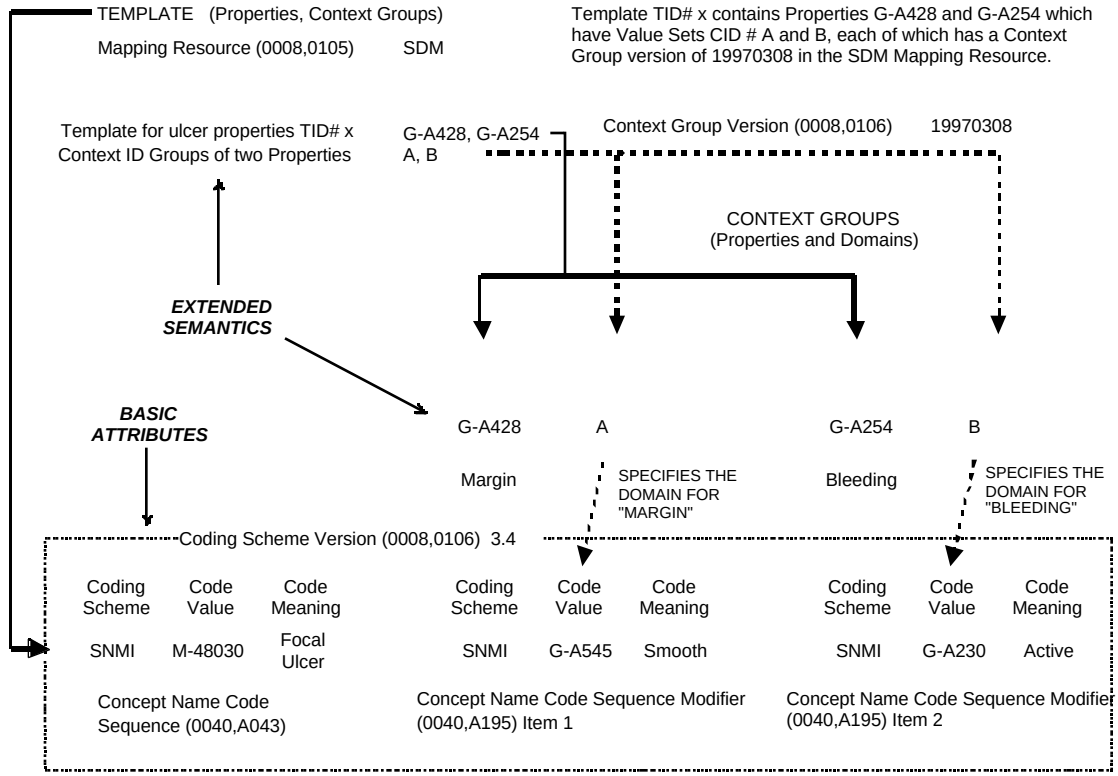
Example 2: The list of iodinated contrast agents available for use in radiological procedures changes as new agents are developed and obsolete agents are retired. The record of the context from which a value was selected may enable a future reviewer of a procedure report to understand why a certain agent might not have been used (e.g. the agent might not have been available at the time of the historical procedure). Thus, the ability to record the version of the terminology resource is useful for accurate representation of current medical knowledge. The Mapping Resource and Version Attributes also enhance interoperability by ensuring shared understanding of Attribute Value Sets and the appropriate sets of context dependent concept relationships (modifier properties) as biomedical knowledge and biomedical language evolve.

The Context Identifier (0008,010F) specifies the Context ID Number, the identification number of a message/terminology Mapping Resource Context Group that specifies the Value Set of Code Sequence Attribute. A Context Group is essentially a list of terms. A separate record in the Mapping Resource is defined for each unique concept in each Context Group. Concepts in the SDM and TeRMS are identified by unique internal keys and by external (foreign) keys that map the concept to the source Lexicon and to the UMLS Metathesaurus (Trademark, U.S. National Library of Medicine, Bethesda, MD). The SDM is the DICOM/SNOMED subset of the TeRMS. TeRMS and SDM records are mappable via the Concept Unique Identifier (CUI) and String Unique Identifier (SUI) of the UMLS Metathesaurus (Trademark, U.S. National Library of Medicine, Bethesda, MD). At the Value Set level (i.e. context-dependent Attribute value-set specifications) SDM Context ID Numbers map to the DICOM/SNOMED subset of TeRMS Context ID Numbers.

Example 3. Figure D.3-1 illustrates the semantic dependencies involved in the specification of two properties of an ulcer: Margination and Bleeding Activity. These two properties are the "Modifier Property Group" that is specified by an SDM Template. The fact that these two properties are significant for ulcers is an example of the type of domain knowledge stored in SDM Templates. Each SDM Template is identified by a Template ID Number (TID). Templates specify sets of Properties (attributes) that are useful in a particular clinical or operational context.

Templates also specify Context Groups that define the Value Set of the coded Properties. The Value Set (i.e. domain or "answer-set") of each Property is specified by the Template as a Context Group, each of which is identified with a Context ID Number. The set of Context Groups for all properties in the Template is the "Modifier Property Context ID Group". Template x used in the example of Figure D.3-1 specifies the properties that modify the Concept Name Attribute.

Figure D.3-1



Note that the Coding Scheme Designator (0008,0102), Code Value (0800,0100) and Code Meaning (0008,0104) are essential (and therefore mandatory) for information transfer. *[Note: Code Meaning is optional in HL7 V.2.3.]* . Coding Scheme Version (0008,0103) is also conditional if necessary to prevent problems caused by version-incompatibility and private coding schemes. The Mapping Resource (0008,0105), Context Group Version (0008,0106), and Context Identifier (0008,010F) are not critical for immediate information transfer. However, they preserve the original semantic context for future reference in the longitudinal record. Related Code Sequence Attribute, Modifier Item Count, Modifier Property Group, and Modifier Property Context ID Group are not conveyed in messages. They are application software logical attributes that represent context dependent domain knowledge in the user interface, message parser, or database manager. These internal attributes may be used by the data acquisition environment of the sending application or to expedite the presentation of complex concepts by the receiving application.

For further definition of Mapping Resource dependencies and constraints on Coded Entry Attributes see Section 8.8 (Standard Attribute Sets for Coded Entry Attributes). Section 8.8 provides generic specifications for the Attribute Sets of Code Sequence Attributes. Section 8.8

is referenced by Attribute Definitions that use the concise macro form to specify the Sequence Items of Coded Entry Attributes.

Provision is made for adding private extensions to Context Groups and/or Coding Schemes by using Code Set Extension Flag (0008,010B) and Code Set Extension Creator UID (0008,010D). The source of a private Coding Scheme is identified by Private Coding Scheme Creator UID (0008,010C). The version date and time of a privately extended version of a standard Context Group is denoted by Context Group Local Version (0008,0107).

SNOMED DICOM Microglossary Templates provide the ability for the system designer to specify the number and type of Properties that need to be conveyed and the Context Groups that define the Value Set of the Property in various clinical contexts. For example, this allows the observer to fully describe of the concept of "ulcer" with an automatically presented tailored (context dependent) set of Modifier Properties (e.g. diameter, presence or absence of mass effect, margination, bleeding activity). The value set for the "bleeding activity" Modifier Property (e.g. active, inactive, intermittent) and other Modifier Properties could be presented to the user via convenient "pick lists" generated by the software from the appropriate Context Groups. Diameter measurement and other numerical measurements of a Template would be conveyed as Name/Value pairs using the Concept Name Code Sequence (0040,A043) and the Numeric Value (0040,A30A). For further explanation, see the Acquisition Context Module (Section C.7.6.x).

D.4 REFERENCES

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3. Bidgood WD Jr, (editor) The SNOMED DICOM Microglossary. Northfield, IL. College of American Pathologists 1998.

4. Bidgood WD Jr. Documenting the Information Content of Images. Journal of the American Medical Informatics Association. Symposium Supplement: Proceedings of the 1997 AMIA Annual Fall Symposium. 1997:424-428.5.

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6. Bidgood WD Jr., et al. Image-Acquisition Context: Procedure-Description Attributes for Clinically-Relevant Indexing and Selective Retrieval of Biomedical Images. In Press (1998): Journal of the American Medical Informatics Association.

Changes to:

NEMA Standards Publication PS 3.4-1998

Digital Imaging and Communications in Medicine (DICOM)
Part 4: Service Class Specifications

Item: The following sections in PS 3.4 use coding schemes.

Coding Scheme Version is added where indicated in bold and underlined text.

Note that Code Meaning (0008,0104) is already type 1C for the Detached Study Management Sop Classes.

For Modality Worklist, it is not considered wise to change the Return Key Type of Code Meaning (0008,0104) from type 3 to type 1. Consequently this is also not changed for Modality Performed Procedure Step.

C.6.1.1.3 Study Level

Table C.6-2
STUDY LEVEL KEYS FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Description	Tag	Type
Procedure Code Sequence	(0008,1032)	O
>Code Value	(0008,0100)	O
>Coding Scheme Designator	(0008,0102)	O
>Coding Scheme Version	**(0008,0103)**	**O**
>Code Meaning	(0008,0104)	O

C.6.2.1.2 Study level

Table C.6-5
STUDY LEVEL KEYS FOR THE STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL

Description	Tag	Type
Procedure Code Sequence	(0008,1032)	O
>Code Value	(0008,0100)	O
>Coding Scheme Designator	(0008,0102)	O
>Coding Scheme Version	**(0008,0103)**	**O**
>Code Meaning	(0008,0104)	O

Table F.3-5
STUDY NOTIFICATION EVENT INFORMATION

Event type name	Event type ID	Attribute	Tag	Req. type SCU/SCP
Study Scheduled	2			
		Requested Procedure Code Sequence	(0032,1064)	-/2

		>Code Value	(0008,0100)	-/1C (Required if sequence is present)
		>Coding Scheme Designator	(0008,0102)	-/1C (Required if sequence is present)
		>Coding Scheme Version	**(0008,0103)**	**-/3**
		>Code Meaning	(0008,0104)	-/1C (Required if sequence is present)

Table F.4-2
STUDY COMPONENT MANAGEMENT SOP CLASS N-CREATE ATTRIBUTES

Attribute Name	Tag	Requirement Type (SCU/SCP)
Procedure Code Sequence	(0008,1032)	1/1
>Code Value	(0008,0100)	1/1C (Required if sequence is present)
>Coding Scheme Designator	(0008,0102)	1/1C (Required if sequence is present)
>Coding Scheme Version	**(0008,0103)**	**3/3**
>Code Meaning	(0008,0104)	1/1C (Required if sequence is present)

Table F.4-3
STUDY COMPONENT MANAGEMENT SOP CLASS N-SET ATTRIBUTES

Attribute Name	Tag	Requirement Type (SCU/SCP)
Procedure Code Sequence	(0008,1032)	3/1
>Code Value	(0008,0100)	3/1C (Required if sequence is present)
>Coding Scheme Designator	(0008,0102)	3/1C (Required if sequence is present)
>Coding Scheme Version	**(0008,0103)**	**3/3**
>Code Meaning	(0008,0104)	3/1C (Required if sequence is present)

Table F.4-4
STUDY COMPONENT MANAGEMENT SOP CLASS N-GET ATTRIBUTES

Attribute Name	Tag	Requirement Type (SCU/SCP)
Procedure Code Sequence	(0008,1032)	3/1

>Code Value	(0008,0100)	3/1C (Required if sequence is present)
>Coding Scheme Designator	(0008,0102)	3/1C (Required if sequence is present)
>Coding Scheme Version	**(0008,0103)**	**3/3**
>Code Meaning	(0008,0104)	3/1C (Required if sequence is present)

F.7.2.1.1 Modality Performed Procedure Step Subset Specification

Table F.7.2-1
MODALITY PERFORMED PROCEDURE STEP SOP CLASS N-CREATE, N-SET AND FINAL STATE ATTRIBUTES

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Requirement Type Final State (See Note 1)
Performed Procedure Step Relationship				
>Scheduled Action Item Code Sequence	(0040,0008)	2/2	Not allowed	
>>Code Value	(0008,0100)	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme designator	(0008,0102)	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme Version	**(0008,0103)**	**3/3**	**Not allowed**	
>>Code Meaning	(0008,0104)	3/3	Not allowed	
Performed Procedure Step Information				
Procedure Code Sequence	(0008,1032)	2/2	3/2	
>Code Value	(0008,0100)	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Designator	(0008,0102)	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Version	**(0008,0103)**	**3/3**	**3/3**	

>Code Meaning	(0008,0104)	3/3	3/3	
Image Acquisition Results				
Performed Action Item Code Sequence	(0040,0260)	2/2	3/2	
>Code Value	(0008,0100)	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Designator	(0008,0102)	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Version	**(0008,0103)**	**3/3**	**3/3**	
>Code Meaning	(0008,0104)	3/3	3/3	

F.8.2.1.1 Modality Performed Procedure Step Retrieve IOD Subset Specifications

Table F.8.2-1
MODALITY PERFORMED PROCEDURE STEP RETRIEVE SOP CLASS N-GET ATTRIBUTES

Attribute Name	Tag	Requirement Type (SCU/SCP)
Performed Procedure Step Relationship		
>Scheduled Action Item Code Sequence	(0040,0008)	-/2
>>Code Value	(0008,0100)	-/1C (Required if Sequence Item is present)
>>Coding Scheme designator	(0008,0102)	-/1C (Required if Sequence Item is present)
>>Coding Scheme Version	**(0008,0103)**	**-/3**
>>Code Meaning	(0008,0104)	-/3
Performed Procedure Step Information		
Procedure Code Sequence	(0008,1032)	3/2
>Code Value	(0008,0100)	-/1C (Required if Sequence Item is present)
>Coding Scheme Designator	(0008,0102)	-/1C (Required if Sequence Item is present)
>Coding Scheme Version	**(0008,0103)**	**-/3**

>Code Meaning	(0008,0104)	-/3
Image Acquisition Results		
Performed Action Item Code Sequence	(0040,0260)	3/2
>Code Value	(0008,0100)	-/1C (Required if Sequence Item is present)
>Coding Scheme Designator	(0008,0102)	-/1C (Required if Sequence Item is present)
>Coding Scheme Version	**(0008,0103)**	**-/3**
>Code Meaning	(0008,0104)	-/3

Table G.4-5
INTERPRETATION NOTIFICATION EVENT INFORMATION

Event Type Name	Event Type ID	Attribute	Tag	Req. Type SCU/SCP
Interpretation Approved	4			
		Interpretation Diagnosis Codes Sequence	(4008,0117)	-/2
		>Code Value	(0008,0100)	-/1C (Required if sequence is present)
		>Coding Scheme Designator	(0008,0102)	-/1C (Required if sequence is present)
		>Coding Scheme Version	**(0008,0103)**	**-/3**
		>Code Meaning	(0008,0104)	-/1C (Required if sequence is present)

K.6.1.2.2 Modality Worklist Attributes

Table K.6-1 defines the Attributes of the Modality Worklist Information Model:

Table K.6-1
ATTRIBUTES FOR THE MODALITY WORKLIST INFORMATION MODEL

Description / Module	Tag	Match-ing Key Type	Return Key Type	Remark/Matching Type
>Scheduled Action Item Code Sequence	(0040,0008)	O	1C	Either the Scheduled Procedure Step Description (0040,0005) or the Scheduled Action Item Code Sequence (0040,0008) or both shall be supported by the SCP. The Scheduled Action Item Code Sequence contains one or more Action Items.
>>Code Value	(0008,0100)	O	1C	Required if a Sequence Item is present.
>>Coding Scheme Designator	(0008,0102)	O	1C	Required if a Sequence Item is present.
>>Coding Scheme Version	**(0008,0103)**	**O**	**3**	
>>Code Meaning	(0008,0104)	O	3	
Requested Procedure				
Requested Procedure Code Sequence	(0032,1064)	O	1C	The Requested Procedure Description (0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both shall be supported by the SCP. The Requested Procedure Code Sequence shall contain only a single Item.
>Code Value	(0008,0100)	O	1C	Required if a Sequence Item is present.
>Coding Scheme Designator	(0008,0102)	O	1C	Required if a Sequence Item is present.
>Coding Scheme Version	**(0008,0103)**	**O**	**3**	
>Code Meaning	(0008,0104)	O	3	

Digital Imaging and Communications in Medicine

PART 6 Addendum

Codes and Controlled Terminology Data Dictionary

Item: Add the following Data Elements to Part 6 Section 6:

PS 3.6 SECTION 6 REGISTRY OF DICOM DATA ELEMENTS

Tag	Name	VR	VM
(0008,0103)	Coding Scheme Version	SH	1
(0008,0105)	Mapping Resource	CS	1
(0008,0106)	Context Group Version	DT	1
(0008,0107)	Context Group Local Version	DT	1
(0008,010B)	Code Set Extension Flag	CS	1
(0008,010C)	Private Coding Scheme Creator UID	UI	1
(0008,010D)	Code Set Extension Creator UID	UI	1
(0008,010F)	Context Identifier	CS	1