DICOM Correction Proposal

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Correction Number CP-2443
Log Summary: Add missing details to the definition of Template tables
Name of Standard PS3.16 2025a
Rationale for Correction: The definition of Template tables is missing details on the optional “Content Item Descriptions” table and the correct referencing of Template table rows. This CP also points to some missing (or unused) definitions and tries to fix several inconsistencies in the Standard text. It is also proposed to make the following editorial changes to the standard text: • Use a consistent spelling (capitalization) throughout the standard text for the terms “Coding Scheme”.
Correction Wording:

Change PS3.16 Section 3.6 as follows

3.6 DICOM Data Structures and Encoding

This Part of the Standard makes use of the following terms defined in PS3.5:

Data Set See Data Set in PS3.5.

Item See Item in PS3.5.

Change PS3.16 Chapter 4 as follows

4 Symbols and Abbreviations

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

ACR American College of Radiology
ASE American Society of Echocardiography
BCID Baseline Context Group ID
BTID Baseline Template ID
CAP College of American Pathologists
Chest CAD Computer-Aided Detection and/or Computer-Aided Diagnosis for chest radiography
CNAME Context Group Name
Colon CAD Computer-Aided Detection and/or Computer-Aided Diagnosis for colon radiography
CSV Comma-separated Values
DCID Defined Context Group ID
DCMR DICOM Content Mapping Resource
DT Defined Term
DTID Defined Template ID
~~**ECID Enumerated Context Group ID**~~

~~**ETID**~~	~~**Enumerated Template ID**~~
EV	Enumerated Value
FHIR	Fast Healthcare Interoperability Resources
HTML	HyperText Markup Language
IHE	Integrating the Healthcare Enterprise
IHE SVS	IHE Sharing Value Sets
JSON	JavaScript Object Notation
Mammography CAD	Computer-Aided Detection and/or Computer-Aided Diagnosis for Mammography
NEMA	National Electrical Manufacturers Association
OWL	Web Ontology Language
RECIST	Response Evaluation Criteria In Solid Tumors
SNOMED	Systematized Nomenclature of Medicine
TNAME	Template Name
UCUM	Unified Code for Units of Measure
WHO	World Health Organization
XML	eXtensible Markup Language

The following upper-case abbreviations represent specific Attributes:

CM	Code Meaning (0008,0104)
CSD	Coding Scheme Designator (0008,0102)
CSV	Coding Scheme Version (0008,0103)
CV	Code Value (0008,0100) or Long Code Value (0008,0119) or URN Code Value (0008,0120)

Change PS3.16 Chapter 6 as follows

6 Form of Template Specifications

Templates are patterns that specify the Concept Names, Requirements, Conditions, Value Types, Value Multiplicity, Value Set restrictions, Relationship Types and other attributes of Content Items for a particular application.

An IOD may specify that particular Standard Templates shall be used or may be used to define or constrain the content of a Content Item construct. A Content Item construct includes a coded concept name and one of several types of coded values. Content Item constructs are used in:

- the main Data Set and recursively nested Content Sequences (0040,A730) of the SR Document Content Module
- the Acquisition Context Sequence (0040,0555) of the Acquisition Context Module,
- the Protocol Context Sequence (0040,0440) and Content Item Modifier Sequence (0040,0441) of the Scheduled Procedure Step Module, Image Acquisition Results Module, and others.
- the Specimen Preparation Step Content Item Sequence (0040,0612) of the Specimen Module.

Annex A and Annex C of this Part define Standard Templates.

Note

Standard Extended and Private Templates may be defined by implementers of the Standard. The rules for definition of Standard Extended and Private SR Templates are similar to the rules for definition of Standard Extended and Private SOP Classes. One row of a Template ~~**definition**~~ table corresponds to one row of a Module table **in a PS3.3 IOD**.

Each Standard Template is specified by a Template table in this Part. Each Template table specifies exactly one Template, corresponding to a pattern of content within a Content Item construct.

Each Template table identifies whether the order of Content Items is significant or not significant. SOP Instances whose content is based on a Template where the order is significant shall encode the top level Content Items in the order they are specified in the Template, and the subsidiary Content Items under each parent item in the order they are specified, and so on for each Nesting Level. The significance of the order applies only to the Template itself; subsidiary included Templates may have a different order significance.

Note

Even if a Template specifies that the order is not significant, there may be significance to the order in which Content Items are encoded in a SOP Instance. For example, CONTAINER Content Items with ~~**Attribute**~~**a** Continuity of Content (0040,A050) ~~**v**~~**V**alue **of** CONTINUOUS encode Content Items in narrative sequence, and procedure logs encode Content Items in time order.

The Content Items from subsidiary Templates may be intermingled if and only if the parent and subsidiary all specify that the order is not significant. This permits later refactoring into reusable Templates.

The range of concepts and the options that are permitted in a family of SR Documents vary inversely with the level of constraint that is applied by the corresponding SR Template. The more narrow the range of concepts and the more restricted the options permitted by a Template, the more predictable the content of the SR Documents will be.

Note

1. A very specific Template defines a family of SR Documents that are very similar to each other. They have a narrow range of content options (e.g., high level of constraint of Content Item values; use of CODE or NUM with ~~**Enumerated**~~ **Defined** Context Group **Identifier**s) and their content is therefore highly predictable. A very general (e.g., permissive or broad) Template defines a family of SR Documents that may differ considerably from one another. They have a broader range of content options (e.g., low level of constraint of Content Item values; use of TEXT and relatively little restriction of Content Item values) and their content is less predictable.

2. The degree of interoperability that may be achieved with a family of SR Documents generated from a Template may be determined intentionally and precisely at a desired level by appropriate Template design to achieve the necessary degree of predictability of SR Document contents.

6.1 Template Table ~~Field~~ Definition

SR Templates are described using tables of the following form:

Type: (Non-) Extensible
Order: (Non-) Significant
Root: Yes or No

Table TID <#>. <SR Context Template Name>

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1								
2								
3								

Acquisition Context Templates are described using tables of the following form:

Type: (Non-) Extensible
Order: (Non-) Significant

Table TID <#>. <Acquisition Context Template Name>

	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1						
2						
3						

Protocol Context Templates are described using tables of the following form:

Type: (Non-) Extensible
Order: (Non-) Significant

Table TID <#>. <Protocol Context Template Name>

	NL	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1							
2							
3							

The semantics of the fields (columns) of Template tables are defined by subsections of this Section. A row of a Template table specifies either one Content Item or inclusion of another Template that may specify any number of Content Items (see Section 6.2.3 for definition of Included Templates). Each Template table is named by a title, identified by a TID number and further explained by a description such as explanation of Template contents, purpose and use cases.

A separate table of the following form may be used to describe individual rows, i.e., Content Items:

Content Item Descriptions

Row 1	

Rows 2, 3	

The first column contains a reference to the row(s) of the Template table using the respective Row Number(s) (see Section 6.1.1), e.g., "Row 1" refers to the row identified as the first row of the Template table and "Rows 2, 3" refers to the rows identified as second and third row of the Template table. When referring to multiple rows, the Row Numbers are fully enumerated. The second column contains the description of the referenced row(s).

Note

1. **Ranges, such as "Rows 1-3", or other kind of abbreviations are not used.**
2. **It is not necessary to describe all rows of a Template table in this additional table.**

The following conventions are defined for the form of references to coded concepts, Context Groups and Templates.

Code Meanings are enclosed in quotation marks (for example "cm"). Code Values and Coding Scheme Designators are not enclosed in quotation marks unless a comma occurs in the string.

References to coded concepts take the following form:

- EV or DT (CV, CSD, "CM")

  e.g., an Enumerated Value with only CV, CSD, and CM defined is represented as follows: EV (CV, CSD, "CM"), for example EV (76752008, SCT, "Breast").

- MemberOf { BCID or DCID (CID) CNAME } MemberOf selects one term from the specified Context Group.

If reference to a specific Coding Scheme version is required, it takes the following form:

- EV or DT (CV, CSD [CSV], "CM")

  e.g., DT (MA.II.A.5.4A, BI [4.0], "4A - Low suspicion").

References to Context Groups take the following form:

- BCID or DCID (CID) CNAME

  e.g., Defined Context Group **Identifier** 5000 is represented as follows: DCID (5000) Language.

References to Templates take the following form:

- BTID or DTID (TID) TNAME

  e.g., Baseline Template **Identifier** 1000 is represented as follows: BTID (1000) Quotation.

6.1.1 Row Number

Each row of a Template ~~T~~table is denoted by a ~~r~~**R**ow ~~n~~**N**umber. The first row is numbered 1 and subsequent rows are numbered in ascending order with increments of 1. This number denotes a row for convenient description as well as reference in conditions. The Row Number of a Content Item in a Template may or may not be the same as the ordinal position of the corresponding Sequence Item (representing the Content Item) in a Content Sequence (0040,A730), depending on the number of times the Content Item is repeated.

Note

When templates are amended~~,~~ **by adding a new row that is inserted into an existing Template table, i.e., not added after the last row, an alphabetic suffix is appended to the Row Number of the preceding row. E.g., a Row Number of "2a" or "2b" is used to insert the new row between row "2" and "3"** ~~**temporary assignments of new rows between existing rows may be indicated by an alphabetic suffix, as in "6a" after "6", etc**~~.

The Content Item specified in the first row of a Template table may be of any Value Type. Specifically, it is not constrained to be a CONTAINER.

6.1.2 Nesting Level (NL)

When a parent-child relationship is present between two Content Items, the parent is deemed to be the Source Content Item and the child is deemed to be the Target Content Item; see PS3.3 C.17.3.2.4 Content Sequence and Relationship Type.

The ~~n~~**N**esting ~~l~~**L**evel of Content Items is denoted by ">" symbols, one per level of nesting below the initial Source Content Item (of the Template) in a manner similar to the depiction of nested Sequences of Items in Modules Tables in PS3.3. When it is necessary to specify the Target Content Item(s) of a relationship, they are specified in the row(s) immediately following the corresponding Source Content Item. The Nesting Level of a Target Content Item is one greater than the Nesting Level of the corresponding (parent) Source Content Item. The Content Item specified in row 1 of a Template ~~T~~**t**able is at the top level (i.e., no ">" symbol is ever present in the NL field for the first Content Item in the table).

Acquisition Context Templates have no Nesting Level field. Protocol Context and UPS Processing Parameter Templates allow a single Nesting Level implemented through the Content Item Modifier Sequence (see PS3.3).

6.1.3 Relationship ~~W~~**w**ith Source Content Item (Parent)

Relationship Type and ~~**Relationship Mode (i.e., B**~~**b**y-value or ~~**B**~~**b**y-reference~~)~~ constraints, if defined, are specified in this field, as described Table 6.1.3-1.

Relationship Type and Mode are specified for each row that specifies a ~~t~~**T**arget Content Item.

Relationship Type and Mode may also be specified when another Template is included, either "top-down" or "bottom-up" or both (i.e., in the "INCLUDE Template" row of the calling Template, or in all rows of the included Template, or in both places). There shall be no conflict between the Relationship Type and Mode of a row that includes another Template and the Relationship Type and Mode of the rows of the included Template.

Note

SR IODs specify Enumerated Values for Relationship Types. If a Relationship Type other than one of the Defined Terms for Relationship Type (0040,A010) is specified in a Private SOP Class, there is a significant risk to interoperability. Documentation accompanying Templates for Private SOP Classes should define any Relationship-type extensions in the manner that the Standard Relationship Types are defined in PS3.3.

Acquisition Context and Protocol Context Templates have no Relationship field.

Table 6.1.3-1. Syntax of Relationship Constraints

Expression	Definition
RTYPE	Relationship Mode is ~~**B**~~**b**y-value and Relationship Type is RTYPE. For example, "INFERRED FROM".
R-RTYPE	Relationship Mode is ~~**B**~~**b**y-reference and Relationship Type is RTYPE. For example, "R-INFERRED FROM".

6.1.4 Value Type (VT)

The Value Type field specifies the SR Value Type of the Content Item or conveys the word "INCLUDE" to indicate that another Template is to be included (substituted for the row). See Section 6.2.3 for further description of "Included Templates".

6.1.5 Concept Name

Any constraints on the Concept Name are specified in the Concept Name field as defined or enumerated coded entries, or as baseline or defined Context Group **Identifier**s. Alternatively, when the VT field is "INCLUDE", the Concept Name field specifies the Template to be included.

The absence of an entry in the Concept Name field means that any code may be used, from any Coding Scheme, including codes from private Coding Schemes.

6.1.6 Value Multiplicity (VM)

The VM field indicates the number of times that either a Content Item of the specified pattern or an included Template may appear in this position. Table 6.1.6-1 specifies the values that are permitted in this field.

Table 6.1.6-1. Permitted Values for VM

Expression	Definition
i (where 'i' represents an integer)	Exactly i occurrences, where i>=1. E.g., when i=1 there shall be one occurrence of the Content Item in this position.
i-j (where 'i' and 'j' represent integers)	From i to j occurrences, where i and j are >=1 and j>i.
i-n (where 'i' and 'n' represent integers)	i or more occurrences, where i>=1.

6.1.7 Requirement Type

The Requirement Type field specifies the requirements on the presence or absence of the Content Item or included Template.

Note

There is typically no need to specify Requirement Type separately for SCU and SCP of the ~~**Basic**~~ SR SOP Classes, because the SCP is required to support the entire content of any SR Document it receives. Therefore, for ~~**Basic**~~ SR SOP Classes, Requirement Type effectively only applies to the SCU.

The following symbols are used:

M Mandatory. Shall be present. An empty Measured Value Sequence (0040,A300) is not permitted when unknown, only for failures. See Section 6.1.7.1.

MC Mandatory Conditional. Shall be present if the specified condition is satisfied. An empty Measured Value Sequence (0040,A300) is not permitted when unknown, only for failures. See Section 6.1.7.1.

U User Option. May or may not be present.

UC User Option Conditional. May not be present. May be present according to the specified condition.

Note

There is an interaction between the VM and the Requirement Type with respect to the number of times that a Content Item (or included Template) may actually be present, as follows:

Req Type	VM	Actual number of occurrences in the Content Tree
M or MC	1	1
M or MC	1-n	1 to n
U or UC	1	0 or 1
U or UC	1-n	0 to n

6.1.7.1 Requirement Type for Numeric Content Items in Structured Reports

Section C.18.1 Numeric Measurement Macro in PS3.3 permits the Measured Value Sequence (0040,A300), which contains the Numeric Value (0040,A30A) and Measurement Units Code Sequence (0040,08EA) to be zero length.

Note

This does not apply to the Section 10.2 Content Item Macro in PS3.3, which does not permit an empty Measured Value Sequence (0040,A300) nor does it include a Numeric Value Qualifier Code Sequence (0040,A301).

The unknown state shall be distinguished from valid arithmetic or device or algorithm failure related states (in which cases a numeric string that complies with the PS3.5 Value Representation for DS cannot be created).

If the Template Requirement Type is M or MC, then:

- A zero length Measured Value Sequence (0040,A300) is permitted for any of the reasons listed in CID 43 “Numeric Value Failure Qualifier”

- A zero length Measured Value Sequence (0040,A300) is not permitted for any of the reasons listed in CID 44 "Numeric Value Unknown Qualifier", or any other semantically equivalent reason

Note

The intent of the foregoing is to discourage an implementer from thwarting the requirements of the Template. Sending meaningless values, such as a value of zero, when zero is not a realistic value, is also not encouraged.

6.1.8 Condition

The Condition field specifies any conditions upon which presence or absence of the Content Item or its values depends. This field specifies any Concept Name(s) or ~~V~~**v**alues upon which there are dependencies.

References in Condition statements to coded concepts or values, whether to select a Content Item to test or to specify a value to test against, are of the form (CV, CSD, "CM"). As is always the case for coded entries, the matching is performed against CV and CSD, irrespective of the string value of CM.

References may also be made to ~~r~~**R**ow ~~n~~**N**umbers (e.g., to specify exclusive OR conditions that span multiple rows of a Template table). **When referring to multiple rows, the Row Numbers have to be fully enumerated, e.g., "Rows 1, 2, 3". When referring to a single row, the singular form is used, e.g., "Row 2".**

Note

Ranges, such as "Rows 1-3", or other kind of abbreviations, are not used.

The following abbreviations are used **in the Condition field**:

XOR Exclusive OR. One and only one row shall be selected from mutually-exclusive options.

Note

For example, if one of rows 1, 2, 3 or 4 may be included, then for row 2, the abbreviation "XOR Rows 1, 3, 4" is specified for the condition.

IF Shall be present if the condition is TRUE; may be present otherwise.
IFF If and only if. Shall be present if the condition is TRUE; shall not be present otherwise.

6.1.9 Value Set Constraint

Any constraints on the Value Set for a CODE Content Item are specified in this field as defined or enumerated coded entries, or as baseline or defined Context Groups.

The absence of an entry in the Value Set Constraint field for a CODE Content Item means that any code may be used, from any Coding Scheme, including codes from private Coding Schemes.

The Value Set Constraint ~~**column**~~**field** may specify a default value for the Content Item if the Content Item is not present, either as a fixed value, or by reference to another Content Item, or by reference to an Attribute from the Data Set other than within the Content Sequence (0040,A730). For example:

- Defaults to (121006, DCM, "Person")

- Defaults to Value of Institution Name (0008,0080) of the General Equipment Module

A default value may also be specified to indicate that a Content Item is expected to have a particular value unless there is a reason for it to be different. This is especially true in the case where a Content Item is mandatory and, therefore, must not be absent.

Note

For the UIDREF Content Item in Row 1 of TID 1004 "Device Observer Identifying Attributes", the Value Set Constraint column specifies: "Defaults to Value of Device UID (0018,1002) of the General Equipment Module". That means, the value of this Content Item should be the same as the value of the referenced Attribute unless there is a reason for it to be different.

6.1.9.1 NUM Units Constraint

Any constraints on units of measurement are specified in the Value Set Constraint field if and only if the Value Type is NUM. The constraints are specified either as defined or enumerated coded entries, or as baseline or defined Context Groups. For example:

- UNITS = EV (mm, UCUM, "mm")
- UNITS = DCID 7460 “Linear Measurement Unit”

The constraints on the units apply only when Measured Value Sequence (0040,A300) contains an ~~i~~Item (i.e., a numeric value is present).

Note

The presence of constraints on the units does not imply that a value is required to be sent, since Measured Value Sequence (0040,A300) is Type 2 and may be zero length if permitted by the Requirement Type for the Content Item in the Template.

The absence of any constraint on units of measurement means that any code for units may be used, from any ~~c~~Coding ~~s~~Scheme, including codes from private ~~c~~Coding ~~s~~Schemes.

6.1.9.2 CONTAINER Continuation Flag Constraint

The value of the Continuity of Content Flag (0040,A050) may be specified in the Value Set Constraint field if and only if the Value Type is CONTAINER.

Note

The SR Document Content Module specifies ~~"~~SEPARATE~~"~~ and ~~"~~CONTINUOUS~~"~~ as the Enumerated Values for Continuity of Content Flag (0040,A050).

6.1.9.3 SCOORD Graphic Type Constraint

Constraints on the value of the Graphic Type(0070,0023) may be specified in the Value Set Constraint field if and only if the Value Type is SCOORD. The constraint may specify a set of allowed values, or a set of disallowed values. For example:

- GRAPHIC TYPE = {POINT}
- GRAPHIC TYPE = {CIRCLE, ELLIPSE}
- GRAPHIC TYPE = not {MULTIPOINT}

6.1.9.4 TABLE Row, Column, Units and Coded Content Constraints

Constraints on various aspects of the TABLE Content Item may be specified in the Value Set Constraint field, including the manner of encoding the tabulated values, either by row, by column, by individual cells, or by reference to other Content Items, by specifying:

- Fixed values, minimums and/or maximums for the number of table rows (NROWS) and/or columns (NCOLUMNS)
- Defined or enumerated coded entries, or baseline or defined Context Groups for Concept Name Code Sequence (0040,A043) to use in Table Row Definition Sequence (0040,A806) (ROW n) and/or Table Column Definition Sequence (0040,A807) (COLUMN n)
- Defined or enumerated coded entries, or baseline or defined Context Groups for Concept Code Sequence (0040,A168) to use in Cell Values Sequence (0040,A808) (ROW n VALUES) and/or (COLUMN n VALUES) and/or (CELL r, c VALUES)
- Defined or enumerated coded entries, or baseline or defined Context Groups for Measurement Units Code Sequence (0040,08EA) to use in Table Row Definition Sequence (0040,A806) (ROW n UNITS) and/or Table Column Definition Sequence (0040,A807) (COLUMN n UNITS) and/or Cell Values Sequence (0040,A808) (CELL r, c UNITS)
- Permitted VR to use in Selector Attribute VR (0072,0050) for specified rows (ROW n VR)~~-~~, columns (COLUMN n VR) or cells (CELL r,~~ ~~c VR)~~-~~, when values are encoded literally
- Permitted referenced Content Item target (TID ttt ROW rrr) for specified rows (ROW n REF)~~-~~, columns (COLUMN n REF) or cells (CELL r,~~ ~~c REF), when values are specified by reference

It is also helpful to provide a detailed description of the form of the table in the corresponding Content Item Description.

Example 1:

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
5		CONTAINS	TABLE	EV (113734, DCM, "X-Ray Tube Current")	1	M		NCOLUMNS = 2 COLUMN 1 = EV (111526, DCM, "DateTime Started") COLUMN 2 = EV (113734, DCM, "X-Ray Tube Current") COLUMN 2 UNITS = EV (mA, UCUM, "mA") COLUMN 1 VR = DT COLUMN 2 VR = FL

Content Item Descriptions

Row 5	The table of X-Ray Tube Current is encoded as a two-column table, consisting of multiple rows describing corresponding values of datetime and X-Ray tube current. The number of rows is not constrained.

Example 2:

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
5		CONTAINS	TABLE	EV (130520, DCM, " Transformation Matrix")	1	M		NCOLUMNS = 4 NROWS= 4 CELL VR = FD

Content Item Descriptions

Row 5	The Transformation Matrix is encoded as a 4 by 4 matrix of dimensionless numbers of the form defined in Section C.20.2.1.1 Frame of Reference Transformation Matrix in PS3.3. The table may be encoded as entire rows, entire columns or individual cells of double float numeric values.

Example 3:

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
5		CONTAINS	TABLE	EV (126081, DCM, "RECIST 1.1")	1	M		NCOLUMNS = 4 COLUMN 1 = EV (112039, DCM, "Tracking Identifier") COLUMN 2 = EV (363698007, SCT, "Finding Site") COLUMN 3 = EV (272741003, SCT, "Laterality") COLUMN 4 = EV (103339001, SCT, "Long Axis") COLUMN 4 UNITS = EV (mm, UCUM, "mm") COLUMN 1 REF = TID 1500 ROW 9 > TID 1501 ROW 2

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
								COLUMN 2 REF = TID 1500 ROW 9 > TID 1501 ROW 6 COLUMN 3 REF = TID 1500 ROW 9 > TID 1501 ROW 7 COLUMN 4 REF = TID 1500 ROW 9 > TID 1501 ROW 10 > TID 300 ROW 1

Content Item Descriptions

Row 5	The table of RECIST long axis measurements per target lesion is encoded as a four-column table, consisting of multiple rows describing corresponding values of Tracking Identifier, Finding Site, Laterality and Long Axis in mm by reference to other Content Items. The number of rows is not constrained. The Response Criteria is used as the Concept Name of the table.

Example 4:

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
6	>	CONTAINS	TABLE	EV (111632, DCM, "Anode Target Material")	1	UC	XOR Row 6a	>NCOLUMNS = 2 COLUMN 1 = EV (111526, DCM, "DateTime Started") COLUMN 2 = EV (111632, DCM, "Anode Target Material") COLUMN 2 VALUES = DCID 10016 "Anode Target Material" COLUMN 1 VR = DT COLUMN 2 VR = SQ

Content Item Descriptions

Row 6	The table of Anode Target Material values is encoded as a two-column table, consisting of multiple rows describing corresponding values of DateTime Started and Anode Target Material Code Values. The number of rows is not constrained. The Anode Target Material is encoded using a code selected from a Defined Context Group.

6.2 Special Conventions for Template Tables

6.2.1 Multiple Value Sets Depending ~~O~~on Different Conditions

When a Content Item may have different ~~v~~**V**alue ~~s~~**S**ets, each depending on different conditions, the description of each different case begins in a separate row of the Template ~~T~~**t**able.

6.2.2 Target Content Items of Relationships

When it is necessary to specify the Target Content Item(s) of a relationship, they are specified in the row(s) immediately following the Source Content Item. The Nesting ~~l~~**L**evel of a Target Content Item (or set of Target Content Items specified indirectly via an ~~**'include Template' macro**~~**inclusion of another Template, see Section 6.2.3**) is one greater than the Nesting Level of the corresponding Source Content Item, as indicated by an increase in the number of ">" characters in the ~~n~~**N**esting ~~l~~**L**evel.

When a Content Item may be the Source **Content Item** of multiple relationships having different Relationship Types and/or different Relationship Modes and/or different patterns of Target Content Item(s), the description of each different case begins in a separate row of the Template ~~T~~**t**able.

When the Source Content Item of a relationship has a VM of greater than 1, the specified pattern of Target Content Items applies to all instantiations of the Source Content Item.

Note

For example, if a Template specifies that the VM of a Source Content Item is 1-n and specifies a ~~B~~by-value relationship to two CODE Content Items with particular ~~v~~Value ~~s~~Set constraints, then each instantiation of the Source Content Item has a ~~B~~by-value relationship to two CODE Content Items with the specified value constraints.

When a Source Content Item that has a Requirement Type of U, UC or MC is not present (is not instantiated), no Target Content Items of that Source Content Item are present, even if one or more of the Target Content Items is designated with a Requirement Type of M or MC.

Note

In other words, potential children are not present when there is no parent.

6.2.3 Inclusion of Templates

A Template may specify another Template to be included by specifying "INCLUDE" in the Value Type field and the identifier of the included Template in the Concept Name field. All of the rows of the specified Template are in included in the invoking Template, effectively substituting the specified Template for the row where the inclusion is invoked. Whether or not the inclusion is user optional, mandatory or conditional is specified in the Requirement and Condition fields. The number of times the included Template may be repeated is specified in the VM field.

6.2.3.1 Template Parameters

A Template that is included by another Template may include parameters that are replaced by values defined in the invoking Template. Parameters may be used to specify coded concepts or Context Group **Identifer**s in the Concept Name, Condition, or Value Set Constraint fields of a Template.

An included Template that accepts parameters shall be introduced by a table listing those parameters of the form:

Parameter Name	Parameter Usage
...	...
...	...

Parameters are indicated by a name beginning with the character "$".

The invoking Template may specify the value of the parameters in the included Template by name in the Value Set Constraint field of the INCLUDE row. The parameter in the included Template shall be replaced by the specified parameter value. Specification of a parameter value shall be of one of the following forms:

Notation	Definition
$parametername = EV or DT (CV, CSD, "CM")	The parameter passed to the Template is the specified coded term.
$parametername = (CV, CSD, "CM")	The parameter passed to the Template is the specified coded term, used as a parameter in a Condition field of the included Template.
$parametername = BCID or DCID (CID) CNAME	The parameter passed to the Template is the Context Group.
$parametername = MemberOf {BCID or DCID (CID) CNAME}	The parameter passed to the Template is a single coded term from the Context Group in curly braces.

The specification of a parameter value is valid only for the directly included Template. Therefore, it needs to be explicitly respecified in Templates intermediate between the originally specifying Template and the target Template. The intermediate Template may use the same parameter name as used by the Template it invokes; in such a case, the

intermediate Template would invoke the subsidiary Template with a specification in the Value Set Constraint field such as:

$parametername = $parametername

Note

In this case, the left hand instance of $parametername is the name in the subsidiary Template, and the right hand instance is the (parametrized) value passed into the current Template.

The invoking Template is not required to specify all parameters of included Templates. If not specified, the ~~v~~Value ~~s~~Set (term or Context Group) for that parameter is unconstrained. An unconstrained value in a Condition will cause the condition to fail.

6.2.4 Post-coordinated Codes and Has Concept Modifier Relationship

Though it may not be explicitly shown in a particular Template, the use of any coded Concept Name in any Content Item may be defined in a post-coordinated rather than pre-coordinated manner, unless explicitly forbidden by the IOD or the Template.

Accordingly, any such Content Item may have any number of Target Content Items via a "HAS CONCEPT MOD" relationship, even if not explicitly specified in a Template. Each Target Content Item of such a relationship may be more complicated than a single Content Item if the IOD permits (i.e., the post-coordinated concept may potentially be defined by a complex sub-tree).

6.2.5 Extension of Templates

An Extensible Template may be extended in an ~~A~~application generating SOP Instances to include additional Content Items in its definition. Such Content Items shall not duplicate concepts for which an encoding is defined in the Template. I.e., if a method is provided for the encoding of a concept in the Template, that concept shall not be encoded using a different Content Item in an extension to the Template.

Note

There is no requirement that the included additional Content Items in a Template extension be placed at the end of the Template. The additional Content Items may be included at any semantically appropriate location in the Template, regardless of whether the order of Content Items in the Template is significant.

A Non-extensible Template shall not be modified in an ~~A~~application by the addition of Content Items to its definition.

Note

The set of Content Items in either an Extensible or a Non-extensible Template may be changed in subsequent editions of the Standard, in accordance with the procedures of the DICOM Standards Committee.

A Non-Extensible Template may include a Template that is Extensible. In invoking such a Template, the content structure of SOP Instances created from the Non-Extensible Template may vary according to the varying content structure allowed by the extension of the included Template.

Note

Specification of such extensible content in a Non-Extensible Template may be desirable if the Template defines, e.g., a fixed top level structure into which a variety of lower level structures may be "plugged".