

DICOM Correction Proposal Form

Tracking Information - Administration Use Only	
Correction Proposal Number	CP-261
STATUS	
Date of Last Update	6/13/2001
Person Assigned	Harry Solomon
Submitter Name	Harry Solomon
Submission date	3/23/2001

Correction Number CP-261	
Log Summary: Specification of Ordinal or Selection Values	
Type of Modification	Name of Standard
Clarification	PS 3.16
<p>Rationale for Correction</p> <p>A common requirement in SR is to encode an identifier to select a particular item from a set. This is seen in concepts such as "fetus #1 of 3", "protocol stage #2", and "gantry position #5". Note that an ordinal value may be used as an identifier within a defined context; e.g., for a duration of an ultrasound study, an ordinal may be assigned to each fetus and can then be used to identify that fetus in various observation subject context items.</p> <p>As seen in the examples, the value is typically identified by a number. In some cases the number is an ordinal with an ordering of items implied (e.g., "stage #2"), in other cases it is a simple selector with no implied ordering (e.g., "fetus #1"). Even in the latter case as an arbitrary identifier, there is a hint of ordering, if only in the order of selecting the items for identification. In fact, a numeric identifier is almost universally used in common practice, even when textual identifiers could be used as a selector.</p> <p>There are basically four choices for SR Value Type for a standard representation of numeric ordinal or selection values: CODE, NUM, TEXT, or a new ORDINAL.</p> <p>CODE is already defined as including "Representation of nominal or non-numeric ordinal values." To use it for numeric ordinals, a coding scheme would need to be defined that would represent each numeric ordinal by its corresponding cardinal number (a constructed rather than tabular code scheme, similar to UCUM).</p> <p>NUM is defined as a "measured value", and as there is no measurement it may not be appropriate for the numeric ordinals. Additionally, it allows arbitrary decimal fractional values, requires a sequence for units of measurement, and is encoded within an additional level of sequence items that is unnecessary for an ordinal. It is a rather heavyweight construct for ordinals. If NUM were to be used for numeric ordinals, a code value for units of measurement conveying the concept of an ordinal or a numeric identifier would need to be defined. Note that the UCUM "Unitary" is not appropriate since that conveys the semantics of a count of items, not a selection of an item.</p>	

Selection could also be considered as simply the addition of a label, and TEXT can be used for such a label. A specific instance of TEXT may constrain its value to a limited number of characters, or even to a type of character (e.g., "up to three numeric characters"). This provides the most flexibility, allowing the user to choose his own labeling scheme within any imposed constraints. However, it will mean receivers will need to deal with arbitrary labeling schemes.

Alternately, a new ORDINAL Value Type may be defined to convey ordinal or numeric identifier values. This would avoid the issues with using CODE, NUM, and TEXT, but would not be backward compatible with currently defined SR SOP Classes.

These four options are presented below, with examples of TID 1008 (which may or may not be desirable to change).

Sections of documents affected

PS 3.3, Sections A.35, C.17, and C.18

PS 3.6, Section 6

PS 3.16, Sections A and B

Correction Wording:

Option 1 - CODE

Update PS3.3

**Table C.17.3-1
VALUE TYPE DEFINITIONS**

Value Type	Concept Name	Concept Value	Description
CODE	Type of code, e.g. "Findings"	Coded expression of the concept	Categorical coded value. Representation of nominal or (non-numeric) and numeric ordinal values.

**Table C.18.2-1
CODE MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Concept Code Sequence	(0040,A168)	1	This is the value of the Content Item. Only a single Item shall be permitted in this sequence.
>Include 'Code Sequence Macro' Table 8.8-1			<i>If Concept is an ordinal, the Baseline Context ID is 146. Otherwise, no Baseline Context ID is specified.</i>

Update PS3.16

7.2.4 Numeric Ordinal or Identifier Values

Context Group 146 is defined to include numeric ordinal or identifier values, according to the following rules:

- the Coding Scheme Designator is specified as "DCM_ORD"
- the Code Value will be constructed as an integer string
- the Code Meaning may be one of three classes of synonyms:
 - the same string as sent in the Code Value
 - the English language representation of the ordinal corresponding to the Code Value (e.g. "first", "second")
 - the string as sent in the Code Value, plus a two-letter suffix corresponding to the last two letters of the English language representation of the corresponding ordinal (e.g. "3rd", "4th")

Table 8-1 Coding Schemes

Coding Scheme Designator	Description
DCM_ORD	Numeric ordinal or identifier codes

TID 1008 Subject Context, Fetus

Identifies (and optionally describes) a fetus who is the subject.

TID 1008

SUBJECT CONTEXT, FETUS

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		PNAME	EV (121036,DCM, "Mother of fetus")	1	U		Defaults to an observation subject that is a patient prior to replacing the Observation Subject Class with Fetus.
2		UIDREF	EV (121028,DCM, "Subject UID")	1	U		For longitudinal tracking of individual fetuses
3		TEXT	EV (121030,DCM, "Subject ID")	1	U		For longitudinal tracking of individual fetuses (human readable value e.g. "A" or "1")
4		NUM-CODE	EV (121037,DCM, "Fetus Number")	1	M		For separation of multiple fetuses during this procedure e.g. fetus '1' of '2' ... not for longitudinal comparisons.; i.e. the "m" of fetus "m" of "n" Units EV (1,UCUM,"1") ECID (146) Ordinal Values
5		NUM	EV (121038,DCM, "Number of Fetuses")	1	M		i.e. the "n" of fetus "m" of "n" Units EV (1,UCUM,"1")

Context ID 146 – Numeric Ordinal or Identifier Values

Not defined as a table of codes per se, but rather constructed from the set of integers. See 7.2.4.

Option 2 - NUM

Update PS3.3

**Table C.17.3-1
VALUE TYPE DEFINITIONS**

Value Type	Concept Name	Concept Value	Description
NUM	Type of numeric value or measurement, e.g. "BPD"	Numeric value and associated Unit of Measurement, <u>or numeric ordinal</u>	Numeric value fully qualified by coded representation of the measurement name and unit of measurement.

Update PS3.16

TID 1008 Subject Context, Fetus

Identifies (and optionally describes) a fetus who is the subject.

**TID 1008
SUBJECT CONTEXT, FETUS**

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		PNAME	EV (121036,DCM, "Mother of fetus")	1	U		Defaults to an observation subject that is a patient prior to replacing the Observation Subject Class with Fetus.
2		UIDREF	EV (121028,DCM, "Subject UID")	1	U		For longitudinal tracking of individual fetuses
3		TEXT	EV (121030,DCM, "Subject ID")	1	U		For longitudinal tracking of individual fetuses (human readable value e.g. "A" or "1")
4		NUM	EV (121037,DCM, "Fetus Number")	1	M		For separation of multiple fetuses during this procedure e.g. fetus '1' of '2' ... not for longitudinal comparisons.; ie. the "m" of fetus "m" of "n" Units EV (1,UCUM,"1") (100001,DCM,"Ordinal")
5		NUM	EV (121038,DCM, "Number of Fetuses")	1	M		i.e. the "n" of fetus "m" of "n" Units EV (1,UCUM,"1")

DICOM Code Definitions (Coding Scheme Designator "DCM" Coding Scheme Version 01")

Code Value	Code Meaning	Definition
100001	Ordinal	A numeric indicator of ordered position in a set, or selection from a set

Option 3 - TEXT

Update PS3.3

**Table C.17.3-1
VALUE TYPE DEFINITIONS**

Value Type	Concept Name	Concept Value	Description
TEXT	Type of text, e.g. "Findings"	Textual expression of the concept	Free text, narrative description of unlimited length. May also be used to provide a label or identifier.

Update PS3.16

TID 1008 Subject Context, Fetus

Identifies (and optionally describes) a fetus who is the subject.

**TID 1008
SUBJECT CONTEXT, FETUS**

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		PNAME	EV (121036,DCM, "Mother of fetus")	1	U		Defaults to an observation subject that is a patient prior to replacing the Observation Subject Class with Fetus.
2		UIDREF	EV (121028,DCM, "Subject UID")	1	U		For longitudinal tracking of individual fetuses
3		TEXT	EV (121030,DCM, "Subject ID")	1	U		For longitudinal tracking of individual fetuses (human readable value e.g. "A" or "1")
4		NUM TEXT	EV (121037,DCM, "Fetus Number Identifier ")	1	M		For separation of multiple fetuses during this procedure e.g. fetus '1' of '2' ... not for longitudinal comparisons ; ie. the "m" of fetus "m" of "n" Units EV (1,UCUM,"1") Value constrained to 2 alphabetic or numeric characters
5		NUM	EV (121038,DCM, "Number of Fetuses")	1	M		i.e. the "n" of fetus "m" of "n" Units EV (1,UCUM,"1")

Option 4 - ORDINAL

Update PS3.3 Section A.35

A.35.3.3.1 Comprehensive SR IOD Content Constraints

A.35.3.3.1.1 Value Type

Value Type (0040,A040) in the Content Sequence (0040,A730) of the SR Document Content Module is constrained to the following Enumerated Values (see Table C.17.3-1 for Value Type definitions):

...
ORDINAL

A.35.3.3.1.2 Relationship Constraints

...

**Table A.35.3-2
RELATIONSHIP CONTENT CONSTRAINTS FOR COMPREHENSIVE SR IOD**

Source Value Type	Relationship Type (Enumerated Values)	Target Value Type
CONTAINER	CONTAINS	TEXT, CODE, NUM, DATETIME, DATE, TIME, UIDREF, PNAME, SCOORD, TCOORD, COMPOSITE ¹ , IMAGE ¹ , WAVEFORM ¹ , ORDINAL , CONTAINER
TEXT, CODE, NUM, CONTAINER	HAS OBS CONTEXT	TEXT, CODE, NUM, DATETIME, DATE, TIME, UIDREF, PNAME, ORDINAL
CONTAINER, IMAGE ¹ , WAVEFORM ¹ , COMPOSITE ¹	HAS ACQ CONTEXT	TEXT, CODE, NUM, DATETIME, DATE, TIME, UIDREF, PNAME, ORDINAL , CONTAINER (See below).
any type	HAS CONCEPT MOD	TEXT, CODE ² , ORDINAL
TEXT, CODE, NUM	HAS PROPERTIES	TEXT, CODE, NUM, DATETIME, DATE, TIME, UIDREF, PNAME, IMAGE ¹ , WAVEFORM ¹ , COMPOSITE ¹ , SCOORD, TCOORD, ORDINAL , CONTAINER (See below).
TEXT, CODE, NUM	INFERRED FROM	TEXT, CODE, NUM, DATETIME, DATE, TIME, UIDREF, PNAME, IMAGE ¹ , WAVEFORM ¹ , COMPOSITE ¹ , SCOORD, TCOORD, ORDINAL , CONTAINER (See below).
SCOORD	SELECTED FROM	IMAGE ¹
TCOORD	SELECTED FROM	SCOORD, IMAGE ¹ , WAVEFORM ¹

**Table C.17.3-1
VALUE TYPE DEFINITIONS**

Value Type	Concept Name	Concept Value	Description
...			
ORDINAL	<u>Ordinal value or identifier, e.g., "Gantry position index"</u>	<u>Integer value</u>	<u>Value of a Concept Name describing an ordinal, i.e., an integer value designating a position in, or selection from, a set</u>

**Table C.17.3-5
DOCUMENT CONTENT MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Value Type	(0040,A040)	1	The type of the value encoded in this Content Item. Defined Terms: ... ORDINAL
Concept Name Code Sequence	(0040,A043)	1C	Code describing the concept represented by this Content Item. Also conveys the value of Document Title and section headings in documents. Only a single Item shall be permitted in this sequence. Required if Value Type (0040,A040) is TEXT or NUM or CODE or DATETIME or DATE or TIME or UIDREF or PNAME <u>or</u> ORDINAL . Required if Value Type (0040,A040) is CONTAINER and a heading is present, or this is the Root Content Item. Note: That is, containers without headings do not require Concept Name Code Sequence Required if Value Type (0040,A040) is COMPOSITE, IMAGE, WAVEFORM, SCOOD or TCOORD, and the Purpose of Reference is conveyed in the Concept Name. See C.17.3.1 for further explanation.
...			
Ordinal Value	(0040,A125)	1C	Value of the Content Item. Required if Value Type (0040,A040) is ORDINAL.

Update PS3.6 Section 6

Tag	Name	VR	VM
(0040,A125)	Ordinal Value	IS	1

Update PS3.16 Section A

TID 1008 Subject Context, Fetus

Identifies (and optionally describes) a fetus who is the subject.

TID 1008

SUBJECT CONTEXT, FETUS

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		PNAME	EV (121036,DCM, "Mother of fetus")	1	U		Defaults to an observation subject that is a patient prior to replacing the Observation Subject Class with Fetus.
2		UIDREF	EV (121028,DCM, "Subject UID")	1	U		For longitudinal tracking of individual fetuses
3		TEXT	EV (121030,DCM, "Subject ID")	1	U		For longitudinal tracking of individual fetuses (human readable value e.g. "A" or "1")
4		NUM ORDINAL	EV (121037,DCM, "Fetus Number")	1	M		For separation of multiple fetuses during this procedure e.g. fetus '1' of '2' ... not for longitudinal comparisons.; ie. the "m" of fetus "m" of "n" Units EV (1,UCUM,"1")
5		NUM	EV (121038,DCM, "Number of Fetuses")	1	M		i.e. the "n" of fetus "m" of "n" Units EV (1,UCUM,"1")