Digital Imaging and Communications in Medicine (DICOM)

Supplement 115: Evidence Document SOP Classes

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Foreword

This Supplement to the DICOM Standard introduces new TABLE and CONTOUR Value Types for Structured Reporting, an Evidence Document SR SOP Class that includes that new Value Types and additional template-specific SR SOP Classes derived from the Evidence Document SR SOP Class.

This Supplement proposes changes to the following Parts of the DICOM Standard:

PS 3.3 - Information Object Definitions

PS 3.4 - Service Class Specifications

PS 3.6 - Data Dictionary

PS 3.16 - Content Mapping Resource

Scope and Field of Application

Table Content Item

The current Structured Reporting IODs require that numeric values be encoded one at a time in separate Content Items, together with Code Sequences for the Concept Name and for the Units of Measurement.

In many cases, it is desirable to have a single Concept Name and a single Unit of Measurement apply to multiple numeric values. The classic use for this is a table of measurements, such as:

	"Coronary Analysis"						
"Distance from reference point"	(mm)	1.2	1.3	1.4	1.5	1.6	1.7
"Arterial diameter"	(mm)	2.3	2.2	2.3	1.8	0.9	1.3
"Systolic pressure"	(mm[Hg])	138	141	137	155	191	166

In such a case, repeating the Concept Name and Units of Measurement for each value is unnecessary. In fact, this repetition is wrong, since the context of a Table perforce constrains these attributes to common values, and a proper data model should only encode those attributes once.

Similar to tables of numeric measurements, there are many cases for tables of qualitative assessments using coded values, unstructured text, spatial coordinates on an image, or in fact almost any of the value types used for SR.

This Supplement defines a method to encode such tables using a new TABLE Value Type. This Value Type is encoded as a sequence of tuples. Each tuple is a sequence of elements, each constituting one cell in the table. A sequence of Concept Names and associated attributes describes the elements in the tuples.

A table may be labeled as having a preferred presentation, with the tuples presented row-wise or column-wise, or as a two or three dimensional graph.

Contour Coordinates Content Item

As diagnostic images are increasingly used for therapy, there is a need for findings to be referenced to real-world spatial coordinates, i.e., a location, path, or volume region of interest in a real world coordinate system, not spatial coordinates in pixel plane.

This Supplement a new CONTOUR Value Type identical to the set of Contour attributes used in the radiation therapy IODs.

Evidence Document SOP Classes

Since the new SR Value Types introduce new behavior due to the new Content Item types, a new Evidence Documents SR SOP Class has been defined to include their use. Additionally, specialized SOP Classes are specified for evidence documents based on Templates that use the TABLE Value Type.

Open Issues

1. Should the SOP Class name be Evidence Documents ***SR***, or just Evidence Documents?
2. Should the new SOP Class allow future extension of Value Types and Relationship Types without requiring a new SOP Class? How do we ensure compatibility? (allow apps to specify what Value Types will be rendered, and which not?)
3. Need to implement appropriate changes to SR Document General Module.
4. Do we need a general mechanism to explicitly provide relationships between tuple elements of a table? How should that be encoded, since relationships in DICOM SR rely on hierarchical nesting rather than peer to peer? Proposed herein is a mechanism for relationship to the previous tuple element (especially for Selected From relationships from SCOORDs and TCOORDs, or Concept Mod for coded values)
5. Is there any EvDocSR specific behavior we need to specify in Part 4 Annex O?
6. Are there other new Value Types that should be defined? Possibilities include ORDINAL, POST-COORDINATED CODE, HL7v3OBSERVATION.
7. Are there new Relationships that should be defined? In particular, should we refine the HAS CONCEPT MOD relationship based on its specific uses, e.g., separating “equivalent meaning” and “language description” from “post coordination of concept”?
8. Is the mechanism for specifying template specific EvDocSR IODs proposed in A.35.X.4 sufficient? Should it provide for exclusion of certain Value Types or Relationships for each specialization (e.g., forbidding CONTOUR)?
9. Should all template specific EvDocSR IODs be added to PS3.3 Table A.1-1?
10. Does there need to be an informative annex in Part 17?
11. Is there a need for a table cell to be able to contain an arbitrary hierarchical tree of Content Items, including a subsidiary Table? If so, how should that be encoded? How would by-reference relationships to such content be encoded? Would this present a problem for “full and unambiguous rendering”?
12. If an arbitrary tree is not supported, should a restricted tree of post-coordinated coded concept be allowed?
13. Should the Modality of evidence documents be allowed to be the modality of the data from which the content is derived, e.g., US for ultrasound image measurements?
14. Should Null Flavor be added to all Value Types in the main Content Tree?

Part 2 Addendum

Item #01: Add new SOP Classes in Table A.1-2

Table A.1-2

UID VALUES

UID Value	UID NAME	Category
…		
1.2.840.10008.5.1.4.1.1.88.x	**Evidence Document SR**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.3202	**Ventricular Analysis Evidence Document**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.3213	**Quantitative Arterial Analysis Evidence Document**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.3250	**Intravascular Ultrasound Evidence Document**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.3500	**Hemodynamics Evidence Document**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.5100	**Vascular Ultrasound Evidence Document**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.5200	**Echocardiography Evidence Document**	**Transfer**
1.2.840.10008.5.1.4.1.1.88.x.9200	**Cardiovascular Analysis Evidence Document**	**Transfer**

Part 3 Addendum

Modify PS3.3 Table A.1-1:

IODs Modules	…	ED SR
Patient		**M**
Specimen Identification		**U**
Clinical Trial Subject		**U**
General Study		**M**
Patient Study		**U**
Clinical Trial Study		**U**
General Series		
Clinical Trial Series		**U**
Frame of Reference		**U**
Synchronization		**U**
General Equipment		**M**
…		
SR Document Series		**M**
SR Document General		**M**
SR Document Content		**M**
…		
SOP Common		**M**

Add PS3.3 Section A.35.X:

A.35.X Evidence Document SR Information Object Definition

A.35.X.1 Evidence Document SR Information Object Description

The Evidence Document SR IOD specifies a class of documents, the content of which may include textual and a variety of coded information, numeric measurement values, tables, references to SOP Instances, and spatial or temporal regions of interest both within such SOP Instances and in a real-world 3-D space (e.g., within a patient). Relationships by-reference are enabled between Content Items.

Add distinction between evidence document and clinical report

A.35.X.2 Evidence Document SR IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part applies to the Evidence Document SR IOD. Table A.35.X-1 specifies the Modules of the Evidence Document SR IOD.

A.35.X.3 Evidence Document SR IOD Module Table

Table A.35.X-1
EVIDENCE DOCUMENT SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Specimen Identification	C.7.1.2	U
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	SR Document Series	C.17.1	M
	Clinical Trial Series	C.7.3.2	U
Frame of Reference	Frame of Reference	C.7.4.1	U
	Synchronization	C.7.4.2	U
Equipment	General Equipment	C.7.5.1	M
Document	SR Document General	C.17.2	M
	SR Document Content	C.17.3	M
	SOP Common	C.12.1	M

A.35.X.3.1 Evidence Document SR IOD Content Constraints

A.35.X.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.17-7 for Value Type definitions):

TEXT
CODE
NUM
DATETIME
DATE
TIME
UIDREF
PNAME
SCOORD
TCOORD
COMPOSITE
IMAGE
WAVEFORM
CONTAINER
TABLE
CONTOUR

A.35.X.3.1.2 Relationship Constraints

Relationships between content items in the content of this IOD may be conveyed either by-value or by-reference. Table A.35.X-2 specifies the relationship constraints of this IOD. See Table C.17.3-2 for Relationship Type definitions.

Table A.35.X-2
RELATIONSHIP CONTENT CONSTRAINTS FOR EVIDENCE DOCUMENT SR IOD

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

Note: The SOP Classes to which an IMAGE, WAVEFORM or COMPOSITE Value Type may refer, is documented in the Conformance Statement for an application (see PS 3.2 and PS 3.4).

The HAS CONCEPT MOD relationship shall not be conveyed by-reference.

For relationships conveyed by-reference, Content Items with a Value Type of CONTAINER shall only be the target of relationships other than CONTAINS. That is, CONTAINS relationships with CONTAINERS may not span by-reference links; containment of directly nested CONTAINERS shall only be conveyed by value.

Note: 1. It is legal to have a CONTAINS relationship by-reference to a target that is not a CONTAINER, such as a TEXT or CODE, which itself has immediate or distant descendants that are CONTAINERS, which may then subsequently have CONTAINS relationships by value with CONTAINERS.

2. The intent of this constraint is to prevent the need arising to follow by-reference links to build up a strict CONTAINS hierarchy of CONTAINERS that are used as headings and subheadings of an outline. Otherwise the outline hierarchy could become a more general graph than a tree, which would be awkward to render. The intent is not to prohibit by-reference relationships to other parts of the tree that may be part of an outline, which is why only the CONTAINS relationship is forbidden in this constraint.

3. These constraints only apply to by-reference relationships. There is no intent to prohibit CONTAINERS from being the target value types of by-value relationships other than CONTAINS. That is why CONTAINERs are indicated as valid target value types of HAS PROPERTIES, INFERRED FROM and HAS ACQ CONTEXT in Table A.35.X-2.

Relationships by-reference to ancestor Content Items are forbidden in this IOD to prevent loops.

A.35.X.4 Specialized Evidence Document SR IODs

The Evidence Document SR IOD is also used for the following Template-specific IODs; i.e., IODs whose content is constrained by the specified Template.

Table A.35.X-3
Specialized Evidence Document SR IODs

Template ID	IOD Name
3202	Ventricular Analysis Evidence Document
3213	Quantitative Arterial Analysis Evidence Document
3250	Intravascular Ultrasound Evidence Document
3500	Hemodynamics Evidence Document
5100	Vascular Ultrasound Evidence Document
5200	Echocardiography Evidence Document
9200	Cardiovascular Analysis Evidence Document

C.17.2 SR Document General Module

Need general update for Evidence Documents – break out "document" related attributes to module separate from "evidence" attributes?

Table C.17-2
SR DOCUMENT GENERAL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
…			
Completion Flag	(0040,A491)	1	The estimated degree of completeness of this SR Document with respect to externally defined criteria in a manner specified in the Conformance Statement. Note: It may be desirable to make these criteria adaptable to local policies or user decisions. Enumerated Values: PARTIAL = Partial content. COMPLETE = Complete content.
Completion Flag Description	(0040,A492)	3	Explanation of the value sent in Completion Flag (0040,A491).
Verification Flag	(0040,A493)	1	Indicates whether this SR Document is Verified. Enumerated Values: UNVERIFIED = Not attested to. VERIFIED = Attested to by a Verifying Observer Name (0040,A075) who is accountable for its content. Note: The intent of this specification is that the "prevailing final version" of an SR Document is the version having the most recent Verification DateTime (0040,A030), Completion Flag (0040,A491) of COMPLETE and Verification Flag (0040,A493) of VERIFIED.
…			
Current Requested Procedure Evidence Sequence	(0040,A375)	1C	Full set of Composite SOP Instances, of which the creator is aware, that were created to satisfy the current Requested Procedure(s) for which this SR Document is generated or that are referenced in the content tree. One or more Items may be included in this sequence. Required if the creator is aware of Composite Objects acquired in order to satisfy the Requested Procedure(s) for which the SR Document is generated or if instances are referenced in the content tree. May be present otherwise. See C.17.2.3 for further explanation.
>Include 'SOP Instance Reference Macro' Table C.17-3			
Pertinent Other Evidence	(0040,A385)	1C	Other Composite SOP Instances that are

Sequence			considered to be pertinent evidence by the creator of this SR Document. This evidence must have been acquired in order to satisfy Requested Procedures other than the one(s) for which this SR Document is generated. One or more Items may be included in this sequence. Required if pertinent evidence from other Requested Procedures needs to be recorded. See C.17.2.3 for further explanation.
>Include 'SOP Instance Reference Macro' Table C.17-3			

C.17.3 SR Document Content Module

…

Table C.17-5
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: TEXT NUM CODE DATETIME DATE TIME UIDREF PNAME COMPOSITE IMAGE WAVEFORM SCOORD TCOORD CONTAINER **TABLE** **CONTOUR** See C.17.3.2.1 for further explanation.
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, **or TABLE**. 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, SCOORD, ~~or~~ TCOORD**, or CONTOUR**, and the Purpose of Reference is conveyed in the Concept Name. See C.17.3.2.2 for further explanation.
…			
Include ' Table Macro' Table C.18.x-1 if and only if Value Type (0040,A040) is TABLE.			
Include 'Contour Coordinates Macro' Table C.18.y-1 if and only if Value Type (0040,A040) is			

CONTOUR.

Table C.17-6
DOCUMENT RELATIONSHIP MACRO ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
…			
>Referenced Content Item Identifier	(0040,DB73)	1C	An ordered set of one or more integers that uniquely identifies the Target Content Item of the relationship. The root Content Item is referenced by a single value of 1. Each subsequent integer represents an ordinal position of a Content Item in the Content Sequence (0040,A730) in which it belongs. The Referenced Content Item Identifier is the set of these ordinal positions along the by-value relationship path. The number of values in this Multi-Value Attribute is exactly the number of relationships traversed in the SR content tree plus one. Note: 1. See C.17.3.2.5. 2. Content Items are ordered in a Content Sequence starting from 1 as defined in VR of SQ (See PS 3.5). Required if the Target Content Item is denoted by-reference, i.e. the Document Relationship Macro and Document Content Macro are not included.
>Referenced Tuple/Element Identifier	**(0040,xxxx)**	**2C**	**An ordered set of two integers that uniquely identifies the referenced Table Element within the Target Content Item of the relationship. The first value identifies the referenced tuple, the second value identifies the element within the tuple. Tuples and elements are referenced by ordinal position in the Table Sequence (0040,x020) and Tuple Elements Sequence (0040,x030), respectively, beginning at 1.** **Required if Referenced Content Item Identifier (0040,DB73) is present, and the Target Content Item is of Value Type TABLE. If the value is zero-length, the reference is to the entire TABLE.**

C.17.3.2.1 Content Item Value Type

…

Table C.17.3-7
VALUE TYPE DEFINITIONS

Value Type	Concept Name	Concept Value	Description
…			
TABLE	**Title of table**	**Content of the table, including a definition of each of the elements**	*tbd*
CONTOUR	**Purpose of reference to the contour**	**Location, path, or volume region of interest in a real world coordinate system**	*tbd*

C.18.x Table Macro

Table C.18.x-1 specifies the Attributes that encode a table of values.

Table C.18.x-1
TABLE MACRO ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Number of Tuples	(0040,x003)	1	Number of Tuples in this Table
Number of Elements per Tuple	(0040,x004)	1	Number of Elements in each Tuple of this Table
Preferred Rendering	(0040,x00A)	3	Defined Terms: ROWS = Tuples are rendered as horizontal rows COLUMNS = Tuples are rendered as vertical columns GRAPH = Tuples are rendered as a graph
Tuple Elements Definition Sequence	(0040,x010)	1	Number of Items equals value of Number of Elements per Tuple (0040,x004)
>Value Type	(0040,A040)	1	The type of the value encoded in the corresponding Tuple Elements Sequence (0040,x030). Defined Terms: TEXT NUMERIC CODE DATETIME UIDREF PNAME COMPOSITE IMAGE WAVEFORM SCOORD TCOORD

			CONTOUR Note: The term NUMERIC differs from the defined term NUM used in the in the Document Content Macro Table C.17-2, but is the same as used in the Content Item Macro Table 10-2. NUMERIC items are encoded with the Numeric Value (0040,A30A) attribute, while NUM items are encoded with the Measured Value Sequence (0040,A300) attribute.
>Concept Name Code Sequence	(0040,A043)	1	Code describing the concept represented by this Tuple Element. Only a single Item shall be permitted in this sequence.
>>Include 'Code Sequence Macro' Table 8.8-1			*No Baseline Context ID.*
>Concept Name Modifier Sequence	(0040,xxx1)	3	Coded name-value pairs modifying the concept name of this Tuple Element. One or more Items may be present in this sequence.
>>Include 'Content Item Macro' Table 10-2			*No Baseline Context ID.* *The Value Type (0040,A040) of each Item of this Sequence shall be CODE or TEXT.*
>Measurement Units Code Sequence	(0040,08EA)	1C	The Units of Measurement for the Tuple Element Required if Value Type (0040,A040) is NUMERIC
>>Include 'Code Sequence Macro' Table 8.8-1			*Defined Context ID is 82.*
>Referenced SOP Sequence	(0008,1199)	1C	The SOP Instance that is the target of the coordinate reference of the Tuple Element. Required if Value Type (0040,A040) is SCOORD or TCOORD, and Selected From target SOP Instance is not specified in the next Tuple Element.
>>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.
>>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.
>>Referenced Frame Number	(0008,1160)	1C	Identifies the frame number within the Referenced SOP Instance to which the reference applies. The first frame shall be denoted as frame number 1. Required if the Referenced SOP Instance is a multi-frame image and the reference does not apply to all frames.
>>Referenced Waveform Channels	(0040,A0B0)	1C	List of channels in Waveform to which the reference applies. See C.18.5.1.1 Required if the Referenced SOP Instance is a Waveform that contains multiple Channels and not all Channels in the Waveform are referenced.

>Relationship Type	(0040,A010)	3	Relationship of the tuple element defined by the prior Item in this Sequence to this tuple element. Enumerated Values: HAS CONCEPT MOD – the coded table value of the prior element is modified by the table value of this element. Valid only for prior element Value Type CODE and current element Value Type CODE. SELECTED FROM – the coordinates table value of the prior element is selected from the SOP Instance identified in the table value of this element. Valid only for prior element Value Type SCOORD or TCOORD and current element Value Type IMAGE or WAVEFORM.
>Graphical Presentation Axis	(0040,x014)	2C	Required if value of Preferred Rendering (0040,x00A) is GRAPH Defined Terms: X = Element is used as horizontal (X-Axis) graphical domain Y = Element is used as vertical (Y-Axis) graphical domain Z = Element value is rendered at (X,Y) display location in an implementation dependent manner If no value is present, the Tuple Element has no preferred use in graphical presentation
Table Sequence	(0040,x020)	1	Number of Items equals value of Number of Tuples (0040,x003)
>Tuple Elements Sequence	(0040,x030)	1	Number of Items equals value of Number of Elements per Tuple (0040,x004)
>>Null Flavor	(0040,x031)	3	Enumerated Values: OTH = The actual value is not an element in the value domain (e.g., numeric underflow, or infinity) MSK = There is information on this value available but it has not been provided due to rules of the Instance creator (e.g., for clinical trial blinding) NA = No proper value is applicable in this context UNK = A proper value is applicable, but not known NI = Value is null, and no categorization of reason has been made Note: See HL7 v3 NullFlavor Vocabulary Domain

>>Text Value	(0040,A160)	1C	Required if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is TEXT, and Null Flavor (0040,x031) is not present
>>Numeric Value	(0040,A30A)	1C	Required if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is NUMERIC, and Null Flavor (0040,x031) is not present
>>Person Name	(0040,A123)	1C	Required if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is PNAME, and Null Flavor (0040,x031) is not present
>>UID	(0040,A124)	1C	Required if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is UIDREF, and Null Flavor (0040,x031) is not present
>>DateTime	(0040,A120)	1C	Required if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is DATETIME, and Null Flavor (0040,x031) is not present
>>Include 'Code Macro' Table C.18.2-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is CODE, and Null Flavor (0040,x031) is not present.			
>>Include 'Composite Object Reference Macro' Table C.18.3-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is COMPOSITE, and Null Flavor (0040,x031) is not present.			
>>Include 'Image Reference Macro' Table C.18.4-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is IMAGE, and Null Flavor (0040,x031) is not present.			
>>Include 'Waveform Reference Macro' Table C.18.5-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is WAVEFORM, and Null Flavor (0040,x031) is not present.			
>>Include 'Spatial Coordinates Macro' Table C.18.6-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is SCOORD, and Null Flavor (0040,x031) is not present.			
>>Include 'Temporal Coordinates Macro' Table C.18.7-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is TCOORD, and Null Flavor (0040,x031) is not present.			
>>Include 'Contour Coordinates Macro' Table C.18.y-1 if and only if Value Type (0040,A040) of corresponding Item in Tuple Elements Definition Sequence (0040,x010) is CONTOUR, and Null Flavor (0040,x031) is not present.			

C.18.x.1 Table Macro Attribute Descriptions

C.18.x.1.1 Tables, Tuples, and Elements

A Table is a two-dimensional set of values of varied Value Types. Each “row” of the Table is a Tuple, an ordered set of Elements. Each Element ordinal position is associated with a Concept Name and a Value Type; the number and order of Elements is identical in every Tuple of a Table. Each “column” of the Table is thus defined by a Concept Name and a Value Type.

Note: "Row" and "column" are used as conceptual terms and do not imply horizontal or vertical presentation; see C.18.x.1.2 for description of the Preferred Rendering attribute.

The individual Elements in a Table are thus name-value pairs, where the name is the Concept Name for the Element ordinal position, and the value is specified by the Element value.

There is an implicit relationship between the Elements in a Tuple. There may be an explicit HAS CONCEPT MOD or SELECTED FROM relationship between adjacent Elements in a Tuple.

The TABLE Content Item may have relationships to other Content Items. Such relationships apply to the Table as a whole or to its Concept Name (Table title). The TABLE Content Item shall not have CONTAINS or SELECTED FROM relationships to other Content Items.

C.18.x.1.2 Preferred Rendering and Graphical Presentation Axis

The Preferred Rendering (0040,x00A) attribute specifies how the creator of the SOP Instance intended the Table to be presented to a user.

A value of ROWS indicates Tuples are rendered as horizontal rows; e.g.:

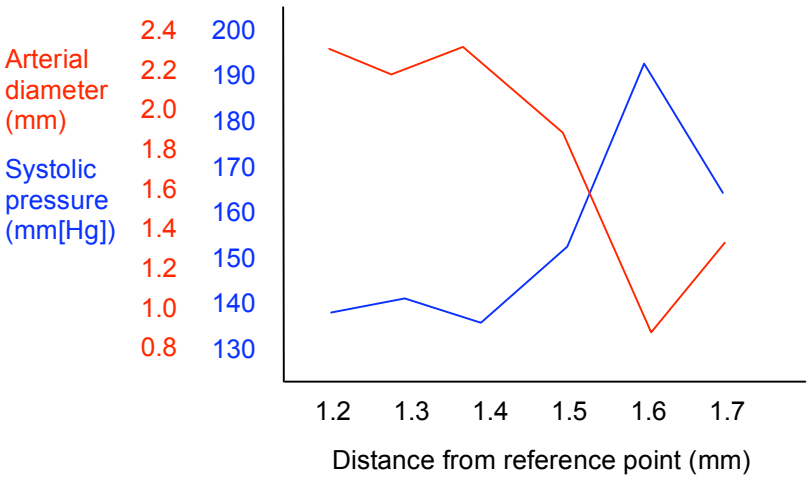
Distance from reference point (mm)	Arterial diameter (mm)	Systolic pressure (mm[Hg])
1.2	2.3	138
1.3	2.2	141
1.4	2.3	137
1.5	1.8	155
1.6	0.9	191
1.7	1.3	166

A value of COLUMNS indicates Tuples are rendered as vertical columns; e.g.:

Distance from reference point (mm)	1.2	1.3	1.4	1.5	1.6	1.7
Arterial diameter (mm)	2.3	2.2	2.3	1.8	0.9	1.3
Systolic pressure (mm[Hg])	138	141	137	155	191	166

A value of GRAPH indicates Tuples are rendered as a two- or three-dimensional graph. For a two-dimensional graph, one Table "column" is selected by the Graphical Presentation Axis (0040,x014) as the X dimension, and one or more as the Y dimension, e.g.:

Distance from reference point (mm)	Arterial diameter (mm)	Systolic pressure (mm[Hg])
X	Y	Y



For a three-dimensional graph, one Table "column" is selected by the Graphical Presentation Axis (0040,x014) as the X dimension, one as the Y dimension, and one or more as the Z dimension.

In all cases, actual rendering of the Table content is under the control and discretion of the receiving application, and may or may not use the specified Preferred Rendering.

C.18.x.1.3 Tuple Elements Definition Sequence

Each Item describes the element at the corresponding ordinal position in the Tuple Elements Sequence (0040,x030)

C.18.x.1.3.1 Concept Name and Concept Name Modifier

The Concept Name in a Tuple Elements Definition Sequence specifies the concept of the element at the corresponding ordinal position in the Tuple Elements Sequence (0040,x030), and is equivalent to the Concept Name of a Content Item.

Concept Name Modifiers are name-value pairs representing post-coordinating modifiers for the Concept Name, and are equivalent to a subsidiary Content Item with the relationship HAS CONCEPT MOD. Modifiers have a structure like a Content Item, but are restricted to CODE and TEXT value types.

Note: The Value Type of the Concept Name Modifier Items should not be confused with the Value Type of the Tuple Element being defined in the enclosing Tuple Elements Sequence Item.

C.18.x.1.3.2 Referenced SOP Sequence

All SCOORD or TCOORD values for an ordinal position in the Tuple Elements Sequence may be selected from a single SOP Instance identified in the Referenced SOP Sequence (0008,1199), and potentially from a specified subset of frames or waveform channels in that SOP Instance.

C.18.x.1.4 Table Sequence and Tuple Elements Sequence

The Table Sequence encodes the table as a sequence of tuples, and the Tuple Elements Sequence encodes the tuple as a sequence of element Items. Each element Item encodes a value using one or more attributes as specified for the Value Type of the element.

An element may have no value. In such a case, the Tuple Elements Sequence Item shall include a Null Flavor (0040,x031) attribute, and no other attributes.

C.18.y Contour Coordinates Macro

Table C.18.y-1 specifies the Attributes that reference a location, path, or volume region of interest in a real world coordinate system.

Table C.18.y-1
CONTOUR COORDINATES MACRO ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Referenced Frame of Reference UID	(3006,0024)	1	UID of the Frame of Reference that defines the Reference Coordinate System for the Contour Data.
Contour Sequence	(3006,0040)	1	Sequence of Contours defining a path or volume in a Reference Coordinate System. One or more items shall be included in this sequence.
>Contour Geometric Type	(3006,0042)	1	Geometric type of contour. See C.8.8.6.1. Enumerated Values: POINT = single point OPEN_PLANAR = open contour containing coplanar points OPEN_NONPLANAR = open contour containing non-coplanar points CLOSED_PLANAR = closed contour (polygon) containing coplanar points
>Contour Slab Thickness	(3006,0044)	1C	Thickness of slab (in mm) represented by contour, where the Contour Data (3006,0050) defines a plane in the center of the slab, offset by the Contour Offset Vector (3006,0045) if it is present. Required if Contour Sequence represents a volume. See C.8.8.6.2.
>Contour Offset Vector	(3006,0045)	3	Vector (x,y,z) in the real world (patient based) coordinate system described in C.7.6.2.1.1 which is normal to plane of Contour Data (3006,0050), describing direction and magnitude of the offset (in mm) of each point of the central plane of a contour slab from the corresponding original point of Contour Data (3006,0050). See C.8.8.6.2.
>Number of Contour Points	(3006,0046)	1	Number of points (triplets) in Contour Data (3006,0050).
>Contour Data	(3006,0050)	1	Sequence of (x,y,z) triplets defining a contour in the real world (patient based) coordinate system described in C.7.6.2.1.1 (mm). See C.8.8.6.1.

Part 4 Addendum

Add SOP Class to Table B.3-3

Table B.3-3
STANDARD AND RELATED GENERAL SOP CLASSES

SOP Class Name	Related General SOP Class Name
…	
Ventricular Analysis Evidence Document	**Evidence Document SR**
Quantitative Arterial Analysis Evidence Document	**Evidence Document SR**
Hemodynamics Evidence Document	**Evidence Document SR**
Intravascular Ultrasound Evidence Document	**Evidence Document SR**
Vascular Ultrasound Evidence Document	**Evidence Document SR**
Echocardiography Evidence Document	**Evidence Document SR**
Cardiovascular Analysis Evidence Document	**Evidence Document SR**

Add SOP Class to Table B.5-1

B.5 Standard SOP Classes

Table B.5-1
STANDARD SOP CLASSES

SOP Class Name	SOP Class UID	IOD (See PS 3.3)
…		
Evidence Document SR	**1.2.840.10008.5.1.4.1.1.88.x**	**Evidence Document SR**
Ventricular Analysis Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3202**	**Ventricular Analysis Evidence Document**
Quantitative Arterial Analysis Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3213**	**Quantitative Arterial Analysis Evidence Document**
Intravascular Ultrasound Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3250**	**Intravascular Ultrasound Evidence Document**
Hemodynamics Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3500**	**Hemodynamics Evidence Document**
Vascular Ultrasound Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.5100**	**Vascular Ultrasound Evidence Document**
Echocardiography Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.5200**	**Echocardiography Evidence Document**
Cardiovascular Analysis Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.9200**	**Cardiovascular Analysis Evidence Document**

Add Structured Reporting SOP Class to Section B.5.1.5

B.5.1.5 Structured Reporting Storage SOP Classes

The requirements of Annex O apply to the following SOP Classes:

- …
- **Evidence Document SR**

Add SOP Class to Table I.4-1

I.4 Media Storage SOP Classes

Table I.4-1
Media Storage Standard SOP Classes

SOP Class Name	SOP Class UID	IOD (See PS 3.3)
…		
Evidence Document SR	**1.2.840.10008.5.1.4.1.1.88.x**	**Evidence Document SR**
Ventricular Analysis Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3202**	**Ventricular Analysis Evidence Document**
Quantitative Arterial Analysis Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3213**	**Quantitative Arterial Analysis Evidence Document**
Intravascular Ultrasound Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3250**	**Intravascular Ultrasound Evidence Document**
Hemodynamics Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.3500**	**Hemodynamics Evidence Document**
Vascular Ultrasound Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.5100**	**Vascular Ultrasound Evidence Document**
Echocardiography Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.5200**	**Echocardiography Evidence Document**
Cardiovascular Analysis Evidence Document	**1.2.840.10008.5.1.4.1.1.88.x.9200**	**Cardiovascular Analysis Evidence Document**

Add SOP Class to Section I.4.1.2

I.4.1.2 Structured Reporting Storage SOP Classes

The requirements of Annex O apply to the following SOP Classes:

- …
- **Evidence Document SR**

Part 6 Addendum

Tag	Name	VR	VM
(0040,x003)	Number of Tuples	US	1
(0040,x004)	Number of Elements per Tuple	US	1
(0040,x00A)	Preferred Rendering	CS	1
(0040,x010)	Tuple Elements Definition Sequence	SQ	1
(0040,x014)	Graphical Presentation Axis	CS	1
(0040,x020)	Table Sequence	SQ	1
(0040,x030)	Tuple Elements Sequence	SQ	1
(0040,x031)	Null Flavor	CS	1
(0040,xxxx)	Referenced Tuple/Element Identifier	UL	2

Add the following to Table A-1

UID Value	UID Name	UID Type	Part
…			
1.2.840.10008.5.1.4.1.1.88.x	**Evidence Document SR**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.3202	**Ventricular Analysis Evidence Document**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.3213	**Quantitative Arterial Analysis Evidence Document**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.3250	**Intravascular Ultrasound Evidence Document**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.3500	**Hemodynamics Evidence Document**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.5100	**Vascular Ultrasound Evidence Document**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.5200	**Echocardiography Evidence Document**	**SOP Class**	**PS 3.4**
1.2.840.10008.5.1.4.1.1.88.x.9200	**Cardiovascular Analysis Evidence Document**	**SOP Class**	**PS 3.4**

Part 16 Addendum

6.1 Template Table field definition

…

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**, a Tuple Element of a TABLE 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.

…

6.1.2 Nesting Level (NL)

The nesting level 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 PS 3.3. 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 Table is at the top level (i.e. no ">" symbol is ever present in the NL field for the first Content Item in the table).

Nesting Level is also used to specify the Tuple Element(s) within a TABLE Content Item, and explicit relationships between Tuple Elements in a TABLE Content Item. When the Nesting Level identifies an explicit relationship, the target Tuple Element has a nesting level one greater than the Nesting Level of the Source Tuple Element, even though the two Tuple Elements are peer Sequence Items in the Tuple Elements Sequence.

Note: This allows a Table to be specified similarly to a CONTAINER with nested Content Items.

…

6.1.3 Relationship with ~~Source Content Item (~~Parent~~)~~

Relationship Type **of a target Content Item with its source (parent) Content Item,** and Relationship Mode (i.e. By-value or By-reference) constraints, ~~**if defined,**~~ are specified in this field, as described in Table 6.1.3-1. Relationship Type and Mode are specified for each row that specifies a target Content Item.

Additionally, this field specifies the inclusion of a Tuple Element in its TABLE Content Item, and explicit relationship between a Tuple Element and the immediately prior (parent) Tuple Element in a TABLE Content Item.

Table 6.1.3-1
Syntax of Relationship Constraints

Expression	Definition
RTYPE	Relationship Mode is By-value and Relationship Type is *RTYPE*. For example, "INFERRED FROM".
R-*RTYPE*	Relationship Mode is By-reference and Relationship Type is *RTYPE*. For example, "R-INFERRED FROM".
ELEMENT	**Constituent Tuple Element of a TABLE Content Item.**
E-*RTYPE*	**Relationship between Tuple Elements in a TABLE Content Item is RTYPE. For example, "E-SELECTED FROM"**

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.

…

6.1.4 Value Type (VT)

The Value Type field specifies the SR Value Type of the Content Item **or the Tuple Element,** 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".

…

6.1.6 Value Multiplicity (VM)

The VM field indicates the number of times that either a Content Item **or a Tuple Element** 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.

…

6.1.7 Requirement Type

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

…

6.1.8 Condition

The Condition field specifies any conditions upon which presence or absence of the Content Item **or Tuple Element,** or its values depends. This field specifies any Concept Name(s) or Values upon which there are dependencies.

…

6.1.9.4 TABLE Tuples Constraint

Constraints on the number of tuples in a TABLE Content Item may be specified in the Value Set Constraint field. The constraint is specified similarly to Value Multiplicity (see Table 6.1.6-1). For example:

NUMBER OF TUPLES = 1-10

NUMBER OF TUPLES = 100

Annex A – Add tables to QCA, QVA, CVA templates

TID 3209 Centerline Wall Motion Template

TID 3209
CENTERLINE WALL MOTION
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (121070, DCM, "Findings")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (111004, DCM, "Analysis Performed")	1	M		EV (122449, DCM, "Centerline Wall Motion Analysis")
3	>>	HAS CONCEPT MOD	CODE	EV (122410, DCM, "Contour Realignment")	1	M		DCID (3458) Contour Realignment
4	>	CONTAINS	INCLUDE	DTID (300) Measurement	100	M**C**	**XOR Row 5**	$Measurement = EV (122450, DCM, "Normalized Chord Length") $Unit = DT (%, UCUM, "%")
5	**>**	**CONTAINS**	**TABLE**	**EV (122449, DCM, "Centerline Wall Motion Analysis")**	**1**	**MC**	**XOR Row 4**	**NUMBER OF TUPLES = 100**
6	**>>**	**ELEMENT**	**NUMERIC**	**EV (122450, DCM, "Normalized Chord Length")**	**1**	**M**		**UNITS = DT (%, UCUM, "%")**
7	**>>**	**ELEMENT**	**NUMERIC**	**EV (121416, DCM, "Z-score of measurement")**	**1**	**U**		**UNITS = EV ({sd}, UCUM, "Standard Deviations")**
8	**>>**	**ELEMENT**	**SCOORD**		**1**	**U**		
9~~5~~	>	CONTAINS	NUM	EV (122411, DCM, "Threshold Value")	1	M		Values shall be 1, 2 or 3 Units = EV ({sd}, UCUM, "Standard Deviations")
…								

Content Item Descriptions

Row 4	Normalized lengths of the chords determined between ED and ES contour. The measurement template allows the specification of the statistical properties of the normal population and of the chord measurement relative to the population.
Row 5	**This Table Content Item may be used only with the Evidence Document SR SOP Class or specializations thereof.**
Row 8	**The image target of the SCOORD shall be identical for all tuples, and shall be specified in the Tuple Definition Sequence**
Row ~~8~~**12**	If the Circumferential Extent is not specified no limitations to the boundaries for regions are assumed.
…	

TID 3210 Radial Based Wall Motion Template

TID 3210
RADIAL BASED WALL MOTION
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (121070, DCM, "Findings")	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (121058, DCM, "Procedure Reported")	1	M		EV (122493, DCM, "Radial Based Wall Motion Analysis")
3	>	HAS CONCEPT MOD	CODE	EV (122410, DCM, "Contour Realignment")	1	M		DCID (3458) Contour Realignment
4	>	CONTAINS	CONTAINER	EV (121070, DCM, "Findings")	1-n	M**C**	**XOR Row 8**	
5	>>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, "Finding Site")	1	M		DCID (3718) Myocardial Wall Segments in Projection
6	>>	CONTAINS	INCLUDE	DTID (300) Measurement	1	M		$Measurement = EV (122495, DCM, "Regional Contribution to Ejection Fraction") $Unit = DT (%, UCUM, "%")
7	>>	CONTAINS	INCLUDE	DTID (300) Measurement	1-n	U		$Measurement = EV (122496, DCM, "Radial Shortening") $Unit = DT (%, UCUM, "%")
8	**>**	**CONTAINS**	**TABLE**	**EV (121070, DCM, "Findings")**	**1**	**MC**	**XOR Row 4**	
9	**>>**	**ELEMENT**	**CODE**	**EV (G-C0E3, SRT, "Finding Site")**	**1**	**M**		**DCID (3718) Myocardial Wall Segments in Projection**
10	**>>**	**ELEMENT**	**NUMERIC**	**EV (122495, DCM, "Regional Contribution to Ejection Fraction")**	**1**	**M**		**Units = DT (%, UCUM, "%")**
11	**>>**	**ELEMENT**	**NUMERIC**	**EV (122496, DCM, "Radial Shortening")**	**1-n**	**U**		**Units = DT (%, UCUM, "%")**
12 ~~8~~	>	CONTAINS	IMAGE	No purpose of reference	1	U		

Content Item Descriptions

Row 6	The CREF values of the 6 regions determined for the radial based wall motion
Row 7	The shortening of the measured radials within the region
Row 8	**This Table Content Item may be used only with the Evidence Document SR SOP Class or specializations thereof.**
Row ~~8~~**12**	Secondary Capture image with radial based analysis result

TID 3214 Analyzed Segment Template

TID 3214
ANALYZED SEGMENT
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
…								
13	>	CONTAINS	CONTAINER	EV (122509, DCM, "Diameter Graph")	1	U		
14	>>	CONTAINS	NUM	EV (122511, DCM, "Graph Increment")	1	M		Value = 1 Units = DT ({pixels}, UCUM, "pixels")
15	>>	CONTAINS	INCLUDE	DTID (300) Measurement	1-n	M		$Measurement = EV (G-0364, SRT, "Vessel Luminal Diameter") $Unit = DT (mm, UCUM, "mm")
16	**>**	**CONTAINS**	**TABLE**	**EV (122509, DCM, "Diameter Graph")**	**1**	**U**		
17	**>>**	**HAS PROPERTIES**	**NUM**	**EV (122511, DCM, "Graph Increment")**	**1**	**M**		**Value = 1** **Units = DT ({pixels}, UCUM, "pixels")**
18	**>>**	**ELEMENT**	**NUMERIC**	**EV (G-0364, SRT, "Vessel Luminal Diameter")**	**1**	**M**		**Units = DT (mm, UCUM, "mm")**
19	**>>**	**ELEMENT**	**SCOORD**		**1**	**U**		
~~16~~ **20**	>	CONTAINS	NUM	EV (122382, DCM, "Site of Luminal Minimum ")	1	U		Units = DT ({pixels}, UCUM, "pixels")
…								

Content Item Descriptions

…	
Row 13**,16**	The X-axis comprises the pixel points of the midline of the vessel from proximal to distal. The points on the midline are not necessarily equidistant.
Row 15**,18**	For each point of the midline of the vessel a measurement value for the diameter is calculated.
Row 16	**This Table Content Item may be used only with the Evidence Document SR SOP Class or specializations thereof.**
Row 19	**The image target of the SCOORD shall be identical for all tuples, and shall be specified in the Tuple Definition Sequence**
Row ~~16,17~~ **20,21**	The positions in the graph are related to the points on the midline of the vessel.
Row ~~20~~**24**	Secondary Capture image with Arterial Analysis contour.

TID 3215 Angiographic Lesion Analysis Template

TID 3215
ANGIOGRAPHIC LESION ANALYSIS
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
…								
7	>	CONTAINS	CODE	EV (122430, DCM, “Reference Method”)	1	M		DCID (3465) QA Reference Method
8	>	CONTAINS	CONTAINER	EV (xxx, DCM, “Reference Points”)	1	U		
9	>>	CONTAINS	NUM	EV (122337, DCM, “Relative Position”)	1-n	U		$Unit = DT (mm, UCUM, “mm”)
10	>>>	HAS PROPERTIES	INCLUDE	DTID (300) Measurement	1	U		$Measurement = EV (G-0364, SRT, “Vessel Luminal Diameter”) $Unit = DT (mm, UCUM, “mm”)
11	**>**	**CONTAINS**	**TABLE**	**EV (xxx, DCM, “Reference Points”)**	**1**	**U**		
12	**>>**	**ELEMENT**	**NUMERIC**	**EV (122337, DCM, “Relative Position”)**	**1**	**M**		**Units = DT (mm, UCUM, “mm”)**
13	**>>**	**ELEMENT**	**NUMERIC**	**EV (G-0364, SRT, “Vessel Luminal Diameter”)**	**1**	**M**		**Units = DT (mm, UCUM, “mm”)**
14	**>>**	**ELEMENT**	**SCOORD**		**1**	**U**		
~~10~~ **15**	>	CONTAINS	INCLUDE	DTID (300) Measurement	1	M		$Measurement = EV (G-0364, SRT, “Vessel Luminal Diameter”) $TargetSite = (122382, DCM, ”Site of Luminal Minimum”) $Unit = DT (mm, UCUM, “mm”)
…								
~~14~~ **19**	>	CONTAINS	INCLUDE	DTID (3218) Position in Arterial Segment	1	M		
20 ~~15~~	>	CONTAINS	CONTAINER	EV (122517, DCM, “Densitometric Luminal Cross-sectional Area Graph”)	1	U		
21 ~~16~~	>>	CONTAINS	NUM	EV (122511, DCM, “Graph Increment”)	1	M		Value = 1 Units = DT ({pixels}, UCUM, “pixels”)
22 ~~17~~	>>	CONTAINS	INCLUDE	DTID (300) Measurement	1-n	U		$Measurement = EV (G-0366, SRT, ”Vessel Lumen Cross-Sectional Area”) $Unit = (mm2, UCUM, “mm^2”)
23	**>**	**CONTAINS**	**TABLE**	**EV (122517, DCM, “Densitometric Luminal Cross-sectional Area Graph”)**	**1**	**U**		
24	**>>**	**HAS PROPERTIES**	**NUM**	**EV (122511, DCM, “Graph Increment”)**	**1**	**M**		**Value = 1** **UNITS = DT ({pixels}, UCUM, “pixels”)**
25	**>>**	**ELEMENT**	**NUMERIC**	**EV (G-0366, SRT, “Vessel Lumen Cross-Sectional**	**1**	**U**		**UNITS = (mm2, UCUM, “mm^2”)**

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
				Area")				
26 ~~**18**~~	>>	CONTAINS	INCLUDE	DTID (300) Measurement	1	U		$Measurement = EV (G-0366, SRT, "Vessel Lumen Cross-Sectional Area") $Derivation = EV (R-41D2D, SRT, "Calculated") $TargetSite =EV (122481, DCM, "Contour Start") $Unit = (mm2, UCUM, "mm^2")
…								

Content Item Descriptions

Row ~~**8**~~**9**	User defined reference position for method that requires local reference position.
Row ~~**9**~~**10**	Diameter at a local reference position.
Row 11	**This Table Content Item may be used only with the Evidence Document SR SOP Class or specializations thereof.**
Row ~~**10**~~**15**	The reference diameter for the arterial lesion calculated with the applicable reference method
…	
Row ~~**15**~~ **20,23**	The graph with the calculated cross sectional area results based on the densitometric method
Row ~~**17**~~ **22,25**	The cross sectional area measurements calculated based on the densitometric method
Row 23	**This Table Content Item may be used only with the Evidence Document SR SOP Class or specializations thereof.**
Row ~~**18**~~**26**	The cross sectional area measurement at the start of the reconstruction line in the area graph
…	

Part 17 Addendum

What?