Digital Imaging and Communications in Medicine (DICOM)

Supplement 77: Intravascular Ultrasound (IVUS) Structured Reporting

Prepared by:

DICOM Standards Committee, Working Group 1
1300 N. 17th Street Suite 1847
Rosslyn, Virginia 22209 USA

VERSION: Final Text
June 15, 2004

Table of Contents

Foreword

This Supplement to the DICOM Standard introduces new SR Templates and Context Groups for Intravascular Ultrasound (IVUS) Structured Reports. The purpose of IVUS SR is to facilitate the interchange of IVUS quantitative and qualitative measurements and observations made during a catheterization procedure.

This Supplement was developed by Working Group 1 (Cardiovascular Information) of the DICOM Standards Committee, with significant input from the European Society of Cardiology and the American College of Cardiology.

Scope and Field of Application

The Templates and Context Groups defined in this Supplement are part of an effort to integrate IVUS images and measurements into the cath lab and the digital integrated cardiac record. The cath procedure is an image-guided interventional procedure, involving the acquisition and analysis of images and waveforms, the administration of drugs and therapies, and consultation and interaction between many medical disciplines. The cath lab is a multi-modality mix of many types of equipment from many different manufacturers. IVUS is commonly used during a cath procedure, as an adjunct to angiography. IVUS aids in the selection and sizing of stents and balloons, and can offer assurance that a stent has been properly deployed.

This supplement is largely based on the *"American College of Cardiology Clinical Expert Consensus Document on Standards for Acquisition, Measurement and Reporting of Intravascular Ultrasound Studies (IVUS)" - Journal of the American College of Cardiology - Vol. 37, No. 5, 2001. ISSN 0735-1097.*

Part 17 Addendum

Add the following to Annex N of PS3.17 :

Annex N Evidence Document Structures (Informative)

N.x IVUS Report

The IVUS Report contains one or more vessel containers, each corresponding to the vessel (arterial location) being imaged. Each vessel is associated with one or more IVUS image pullbacks (Ultrasound Multi-frame Images), acquired during a phase of a catheterization procedure. Each vessel may contain one or more sub-containers, each associated with a single lesion. Each lesion container includes a set of IVUS measurements and qualitative assessments. The resulting hierarchical structure is depicted in Figure N-2.

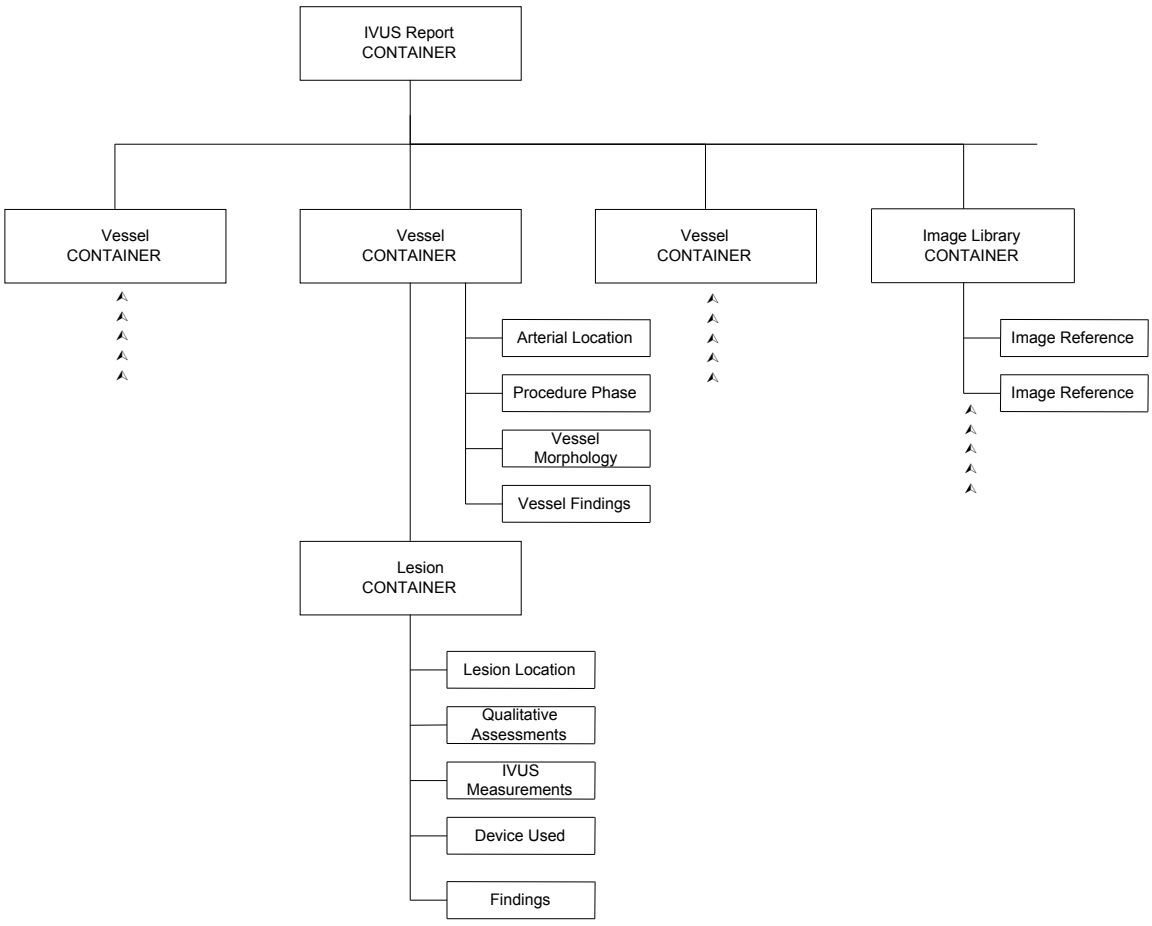

Figure N-2: IVUS Report Structure

Part 16 Addendum

Add the following to PS3.16 Section 2:

2 Normative References

"American College of Cardiology Clinical Expert Consensus Document on Standards for Acquisition, Measurement and Reporting of Intravascular Ultrasound Studies (IVUS)" - Journal of the American College of Cardiology - Vol. 37, No. 5, 2001. ISSN 0735-1097.

"Clinical Application and Image Interpretation in Intravascular Ultrasound", edited by the Working Group of Coronary Circulation (now Interventional Cardiology) and Subgroup on Intravascular Ultrasound of the Working Group of Echocardiography of the European Society of Cardiology – European Heart Journal Vol 19, 1998, pages 207-229

Tobis & Yock, Intravascular Ultrasound Imaging, 1992. ISBN: 0443088098

Add the following to PS3.16 Annex A:

Annex A Structured Reporting Templates (Normative)

IVUS REPORT TEMPLATES

The templates that comprise the IVUS Report within the Evidence Report IOD are interconnected as shown in Figure A-x.

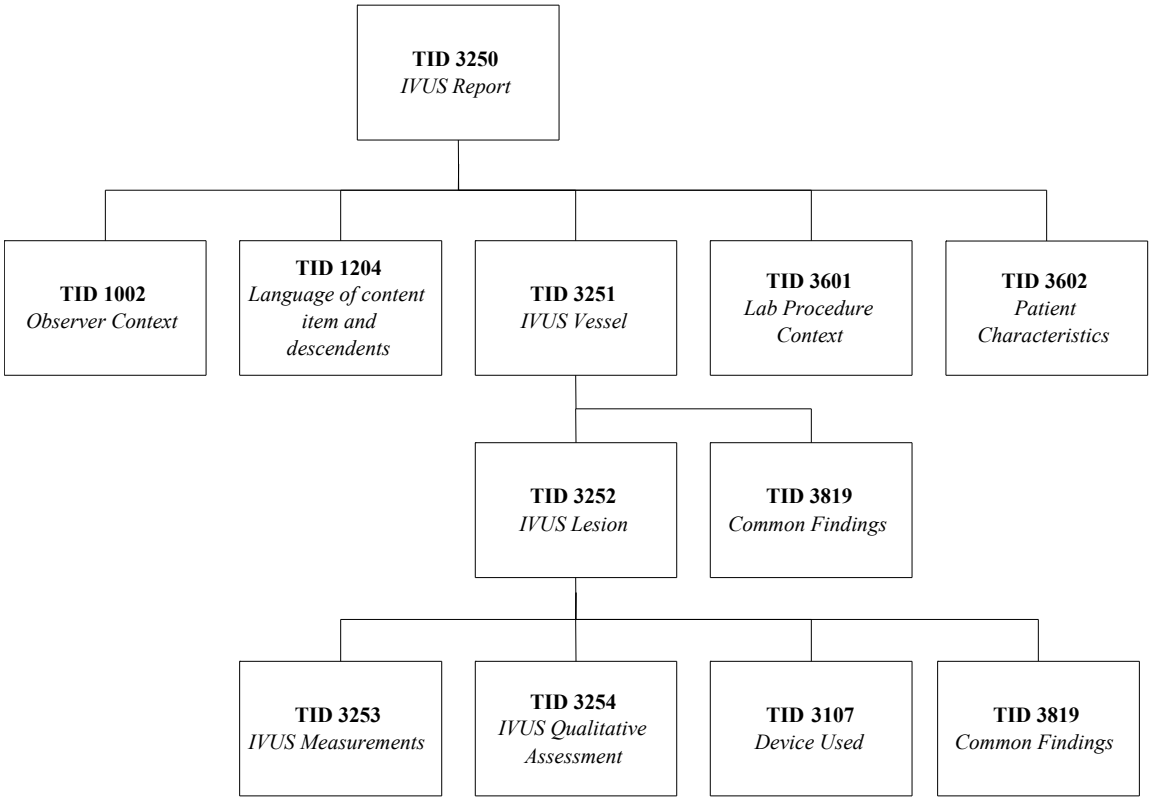

Figure A-x IVUS Report Template Hierarchy

TID 3250 - IVUS Report

The IVUS Report template is the root structure for the representation of IVUS measurements acquired during a catheterization procedure.

Type: Extensible

TID 3250
IVUS Report

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (122325, DCM, “IVUS Report”)	1	M		
2	>	CONTAINS	INCLUDE	DTID (1204) Language of content item and descendents	1	M		
3	>	HAS OBS CONTEXT	INCLUDE	DTID (1002) Observer Context	1	U		
4	>	HAS OBS CONTEXT	INCLUDE	DTID (3601) Lab Procedure Context	1	U		
5	>	HAS ACQ CONTEXT	INCLUDE	DTID (3602) Patient Characteristics	1	U		
6	>	CONTAINS	CONTAINER	EV (111028, DCM, “Image Library”)	1	U		
7	>>	CONTAINS	IMAGE	No purpose of reference	1-n	U		
8	>	CONTAINS	INCLUDE	DTID (3251) IVUS Vessel	1-n	M		

TID 3251 - IVUS Vessel

The IVUS Vessel template provides a structure for grouping one or more lesions analyzed and/or treated during a single phase of a catheterization procedure, according to vessel (or arterial location).

TID 3251
IVUS Vessel

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (121070, DCM, “Findings”)	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	1	U		DCID (3604) Arterial Locations
3	>>	HAS CONCEPT MOD	CODE	EV (G-A1F8, SRT, “Topographical modifier”)	1	U		DCID (3019) Cardio-vascular Anatomic Location Modifiers
4	>>	HAS CONCEPT MOD	CODE	EV (G-C171, SRT, “Laterality")	1	UC	IFF anatomy has laterality	DCID (244) Laterality
5	>	HAS ACQ CONTEXT	CODE	EV (109057, DCM, “Catheterization Procedure Phase”)	1	U		DCID (3480) IVUS Procedure Phases
6	>	CONTAINS	CODE	EV (122134, DCM, "Vessel Morphology")	1-n	U		CID (3712) Vessel Descriptors
7	>	CONTAINS	INCLUDE	DTID (3819) Common Findings	1-n	U		
8	>	CONTAINS	CODE	EV (115, NCDR [2.0b], "Dissection in segment")	1	U		DCID (230) Yes-No
9	>	CONTAINS	INCLUDE	DTID (3252) IVUS Lesion	1-n	U		

TID 3252 - IVUS Lesion

The IVUS Lesion template provides a structure for grouping measurements and observations made on a single lesion during an Intravascular Ultrasound Procedure.

Type: Extensible

TID 3252
IVUS Lesion

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (F-00585, SRT, “Lesion Finding”)	1	M		
2	>	HAS OBS CONTEXT	TEXT	EV (121151, DCM, “Lesion Identifier")	1	M		Up to 3 numeric characters
3	>>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	1-n	U		DCID (3604) Arterial lesion locations
4	>>>	HAS CONCEPT MOD	CODE	EV (G-A1F8, SRT, “Topographical modifier")	1	U		DCID (3019) Cardio-vascular Anatomic Location Modifiers
5	>	HAS ACQ CONTEXT	INCLUDE	DTID (3107) Device Used	1-n	U		
6	>	CONTAINS	INCLUDE	DTID (3253) IVUS Measurements	1	MC	One or both of rows 6 & 7 must be present	
7	>	CONTAINS	INCLUDE	DTID (3254) IVUS Qualitative Assessment	1	MC	One or both of rows 6 & 7 must be present	
8	>	CONTAINS	INCLUDE	DTID(3819) Common Findings	1-n	U		

TID 3252 Content Item Descriptions

Row 2 Lesion Identifier is specified as a numeric text string in order to facilitate trans-coding to DICOM Attribute (0018,3105) Lesion Number and to formats for outcomes registries, such as the ACC National Cardiovascular Data Registry™.

Note: also see TID 3105.

Row 3 - Finding site may span multiple segments with the proximal and distal extent specified by separate items. These may not be totally contained with the segment specified at the Vessel level.

TID 3253 - IVUS Measurements

The IVUS measurements template groups together simple distance, area and angle measurements, along with derived measurements that made during an IVUS procedure. Refer to the “*ACC Clinical Expert Consensus Document on Standards for Acquisition, measurement and Reporting of Intravascular Ultrasound Studies (IVUS)”* for more information.

Type: Extensible

TID 3253
IVUS Measurements

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			INCLUDE	TID (300) Measurement	1-n	U		$Measurement = DCID (3481) IVUS Distance Measurements

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
								$Units = EV (mm, UCUM, "mm") $Derivation = DCID (3488) Min/Max/Mean $TargetSite = BCID (3486) IVUS Measurement Sites
2			INCLUDE	TID (300) Measurement	1-n	U		$Measurement = DCID (3482) IVUS Area Measurements $Units = EV (mm2, UCUM, "mm2") $Derivation = DCID (3488) Min/Max/Mean $TargetSite = BCID (3486) IVUS Measurement Sites
3			INCLUDE	TID (300) Measurement	1-n	U		$Measurement = DCID (3483) IVUS Longitudinal Measurements $Units = EV (mm, UCUM, "mm")
4			INCLUDE	TID (300) Measurement	1-n	U		$Measurement = EV (122355, DCM, "Arc of Calcium") $Units = EV (deg, UCUM,"degrees") $TargetSite = BCID (3486) IVUS Measurement Sites
5			INCLUDE	TID (300) Measurement	1	U		$Measurement = EV (R-101BA, SRT, "Lumen Area Stenosis") $Units = EV (%, UCUM, "%")
6			INCLUDE	TID (300) Measurement	1	U		$Measurement = EV (122354, DCM, "Plaque Burden") $Units = EV (%, UCUM, "%") $TargetSite = BCID (3486) IVUS Measurement Sites
7			INCLUDE	TID (300) Measurement	1-n	U		$Measurement = DCID (3484) IVUS Indices and Ratios $Units = EV (1, UCUM, "ratio") $TargetSite = BCID (3486) IVUS Measurement Sites
8			INCLUDE	TID (3255) IVUS Volume Measurement	1-n	U		
9			INCLUDE	TID (300) Measurement	1	U		$Measurement = EV (122339, DCM, "Stent Volume Obstruction") $Units = EV (%, UCUM, "%")

TID 3254 - IVUS Qualitative Assessments

The IVUS Qualitative Assessments template groups together the qualitative properties of a lesion that are observed during an IVUS procedure. Refer to the "*ACC Clinical Expert Consensus Document on Standards for Acquisition, measurement and Reporting of Intravascular Ultrasound Studies (IVUS)"* for more information.

Type: Extensible

TID 3254
IVUS Qualitative Assessments

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CODE	EV (122133, DCM, "Lesion Morphology")	1-n	U		DCID (3491) IVUS Lesion Morphologies
2			CODE	EV (121071, DCM, "Finding")	1-n	U		DCID (3494) IVUS Non Morphological Findings
3	>		INCLUDE	DTID (1350) "Negation Modifier, Presence of Finding"	1	U		
4			CODE	EV (121071, DCM, "Finding")	1	U		EV (D3-81310, SRT, "Arterial Dissection")
5	>	HAS CONCEPT MOD	CODE	EV (122387, DCM, "Dissection Classification")	1	U		DCID (3492) IVUS Dissection Classifications
6	>		INCLUDE	DTID (1350) "Negation Modifier, Presence of Finding"	1	U		
7			CODE	EV (122391, DCM, "Relative Stenosis Severity")	1	U		DCID (3493) IVUS Relative Stenosis Severities
8			CODE	EV (108, NCDR [2.0b], "Previously Dilated Lesion ")	1	U		DCID (3750) Previously Dilated Lesion
9			CODE	EV (121071, DCM, "Finding")	1	U		EV (122393, DCM, "Restenotic Lesion")
10	>		INCLUDE	DTID (1350) "Negation Modifier, Presence of Finding"	1	U		
11			CODE	EV (111009, "Calcification Type")	1	U		DCID (3489) Calcium Distribution

TID 3255 - IVUS Volume Measurement

The IVUS Volume Measurement Template contains information describing an IVUS Volumetric measurement

Type: Extensible

TID 3255
IVUS Volume Measurement

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			INCLUDE	TID (300) Measurement	1	M		$Measurement = DCID (3485) IVUS Volume Measurements $Units = EV (mm3, UCUM, "mm3") $TargetSite = BCID (3487) IVUS Volumetric Regions
2	>	HAS PROPERTIES	NUM	EV (122336, DCM, “Vascular Volume measurement length”)	1	U		$Unit = DT (mm, UCUM, “mm”)
3	>	HAS PROPERTIES	NUM	EV (122337, DCM, “Relative position”)	1	U		$Unit = DT (mm, UCUM, “mm”)
4	>>	HAS CONCEPT MOD	CODE	EV (122340, DCM, "Fiducial feature”)	1	M		DCID (3496) IVUS Fiducial Points

Add the following to PS3.16 Annex B:

Annex B DCMR Context Groups (Normative)

Context Group 3480 - IVUS Procedure Phases

This context group outlines the phases of a catheterization procedure in which measurements are performed.

Context Group 3480
IVUS Procedure Phases
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	G-7298	Cardiac catheterization post-intervention phase
SRT	G-7296	Cardiac catheterization pre-intervention phase

Context Group 3481 - IVUS Distance Measurements

This context group is the set of distance measurements made in an IVUS procedure.

Context Group 3481
IVUS Distance Measurements
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122330	EEM Diameter
SRT	G-0364	Vessel lumen diameter
SRT	M-02551	Stent Diameter
DCM	122331	Plaque Plus Media Thickness
DCM	122332	Lumen Perimeter

Context Group 3482 - IVUS Area Measurements

This context group is the set of cross-sectional area measurements made in an IVUS procedure.

Context Group 3482
IVUS Area Measurements
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122333	EEM Cross-Sectional Area
SRT	G-0366	Vessel lumen cross-sectional area
SRT	R-101AF	Stent Cross-Sectional Area
DCM	122334	Plaque plus Media Cross-Sectional Area
DCM	122335	In-Stent Neointimal Cross-Sectional Area

Context Group 3483 - IVUS Longitudinal Measurements

This context group is a set of measurements that are made on a longitudinal image. A longitudinal image is a perpendicular cut plane reconstructed from an IVUS pullback multi-frame image.

Context Group 3483
IVUS Longitudinal Measurements
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	R-41FA7	Stent Length
SRT	R-101BA	Stenotic Lesion Length
DCM	122341	Calcium Length
DCM	122364	Stent Gap

Context Group 3484 - IVUS Indices and Ratios

This context group is the set of index and ratio calculations made in an IVUS procedure.

Context Group 3484
IVUS Indices and Ratios
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122343	Lumen Eccentricity Index
DCM	122344	Plaque plus Media Eccentricity Index
DCM	122345	Remodeling Index
DCM	122346	Stent Symmetry Index
DCM	122347	Stent Expansion Index
DCM	122348	Lumen Shape Index
DCM	122350	Lumen Diameter Ratio
DCM	122351	Stent Diameter Ratio
DCM	122352	EEM Diameter Ratio

Context Group 3485 - IVUS Volume Measurements

This context group is the set of volume measurements made from an IVUS procedure.

Context Group 3485
IVUS Volume Measurements
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122371	EEM Volume
DCM	122372	Lumen Volume
SRT	R-101B2	Stent Volume
DCM	122374	In-Stent Neointimal Volume
DCM	122375	Native Plaque Volume

DCM	122376	Total Plaque Volume

Context Group 3486 - **IVUS Measurement Sites**

This context group is the set of sites where IVUS measurements can be made.

Context Group 3486
IVUS Measurement Sites
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122380	Proximal Reference
DCM	122381	Distal Reference
DCM	122382	Site of Lumen Minimum

Context Group 3487 - **IVUS Volumetric Regions**

This context group is the set of regions where IVUS volumetric measurements can be made.

Context Group 3487
IVUS Volumetric Regions
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122383	Stented Region
DCM	122384	Entire Pullback
DCM	122385	Proximal Stent Margin
DCM	122386	Distal Stent Margin
SRT	M-01000	Lesion

Context Group 3488 - Min/Max/Mean

This context group contains modifiers that indicate whether the measurement is a minimum, maximum or averaged value.

Context Group 3488
Min/Max/Mean
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	G-A437	Maximum
SRT	R-404FB	Minimum
SRT	R-00317	Mean

Context Group 3489 - Calcium Distribution

This context group is a set of modifiers specifying the distribution of a calcium deposit in an arc of calcium measurement.

Context Group 3489
Calcium Distribution
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	G-A139	Superficial
SRT	G-A140	Deep

Context Group 3491 - IVUS Lesion Morphologies

This context group is a set of qualitative assessments for lesion morphology.

Context Group 3491
IVUS Lesion Morphologies
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
Include CID 3495		
DCM	122356	Soft plaque
DCM	122357	In-Stent Neointima
SRT	D3-80027	Arterial (True) Aneurysm
SRT	M-32390	Pseudo Aneurysm
DCM	122361	False Lumen
SRT	R-4047B	Concentric
SRT	R-40416	Eccentric
SRT	M-52103	Plaque Ulceration
DCM	122363	Plaque Rupture
DCM	122389	Vulnerable Plaque
DCM	122390	Eroded Plaque

Context Group 3492 - IVUS Dissection Classifications

This context group is a set of dissection classifications commonly detected with IVUS.

Context Group 3492
IVUS Dissection Classifications
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	R-101B7	Medial Dissection
SRT	R-101B8	Intimal Dissection
SRT	R-101B9	Adventitial Dissection
SRT	M-35063	Intramural hematoma
DCM	122388	Intra-stent Dissection

Context Group 3493 - IVUS Relative Stenosis Severities

This context group is a set of stenosis severity classifications for multiple lesions within a segment. There will always be a worst stenosis (T-1), the stenosis with the smallest lumen size. There can be multiple secondary stenoses (T-2, T-3, etc.), which are lesions meeting the definition of a stenosis, but with lumen sizes larger than the worst stenosis. Reference *"American College of Cardiology Clinical Expert Consensus Document on Standards for Acquisition, Measurement and Reporting of Intravascular Ultrasound Studies (IVUS)".*

Context Group 3493
IVUS Relative Stenosis Severities
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122367	T-1 Worst
DCM	122368	T-2 Secondary
DCM	122369	T-3 Secondary
DCM	122370	T-4 Secondary

Context Group 3494 - IVUS Non Morphological Findings

Context Group 3494
IVUS Non Morphological Findings
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
DCM	122360	True Lumen
SRT	R-101B3	Arterial Blood Stasis
SRT	R-101B5	Incomplete Stent apposition
SRT	R-101B6	Acquired Incomplete stent apposition

Context Group 3495 - IVUS Plaque Composition

This context group is a set of qualitative assessments defining the composition of plaque.

Context Group 3495
IVUS Plaque Composition
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	M-78260	Fibrous Plaque
SRT	D6-34737	Vascular Calcification
SRT	M-35001	Thrombus
DCM	122394	Fibro-Lipidic Plaque
DCM	122395	Necrotic-Lipidic Plaque

Context Group 3496 - IVUS Fiducial Points

This context group is a set of fiducial points (anatomical markers). Fiducial points are used as identifiable axial landmarks in determining the location of a measurement in a vessel.

Context Group 3496
IVUS Fiducial Points
Type: Extensible Version: 20040614

Code Scheme	Code Value	Concept Name
SRT	G-035D	Collateral Branch of vessel
SRT	A-25500	Stent
SRT	D6-34737	Vascular Calcification
SRT	M-78260	Fibrous Plaque
SRT	T-48000	Vein
SRT	G-036A	Vessel Origin

Add the following definitions to Part 16 Annex D DICOM Controlled Terminology Definitions (Normative):

Annex D DICOM Controlled Terminology Definitions (Normative)

Code Value	Code Meaning	Definition
122325	IVUS Report	Intravascular Ultrasound Report
122330	EEM Diameter	External Elastic Membrane (EEM) diameter measured through the center point of the vessel. Center point of the vessel is defined as the center of gravity of the EEM area. The EEM is a discrete interface at the border between the media and the adventitia.
122331	Plaque Plus Media Thickness	The distance from intimal leading edge to the external elastic membrane along any line passing through the luminal center, which is defined as the center of gravity of the lumen area.
122332	Lumen Perimeter	Planimetered perimeter of the lumen.
122333	EEM Cross-Sectional Area	Vessel area measured at the External Elastic Membrane (EEM), a discrete interface at the border between the media and the adventitia.
122334	Plaque plus Media Cross-Sectional Area	Area within the EEM occupied by atheroma, regardless of lumen compromise. Plaque plus Media Area = EEM cross-sectional area - vessel lumen cross-sectional area
122335	In-Stent Neointimal Cross-Sectional Area	Measurement of in-stent restenosis. In-Stent Intimal Area = Stent cross-sectional area – vessel lumen cross-sectional area
122336	Vascular Volume measurement length	Longitudinal extent of the Vascular Volume Measurement. This is the distance from the distal edge to the proximal edge of the Volume measurement.
122337	Relative position	Longitudinal distance from the closest edge of a fiducial feature or reference location to the start of the vascular measurement. This value will be a positive if the measurement is distal to the fiducial feature or reference location, or negative if the measurement is proximal to the fiducial feature or reference location.
122339	Stent Volume Obstruction	In-Stent Neointimal Volume / Stent Volume
122340	Fiducial feature	Reference, normally anatomical, which is used for locating the position of a measurement.
122341	Calcium Length	Longitudinal calcium length measurement
122343	Lumen Eccentricity Index	Measurement of vessel lumen eccentricity. Lumen Eccentricity Index = (maximum vessel lumen diameter - minimum vessel lumen diameter) / maximum vessel lumen diameter. Lumen diameters are measured through the center point of the lumen, which is defined as the center of gravity of the lumen area.
122344	Plaque plus Media Eccentricity Index	Plaque plus Media Eccentricity Index = (maximum Plaque plus media thickness - minimum Plaque plus media thickness) / maximum Plaque plus media thickness

122345	Remodeling Index	Measurement of increase or decrease in EEM area that occurs during the development of atherosclerosis. Remodeling Index = Lesion EEM area / reference EEM area
122346	Stent Symmetry Index	Measurement of stent circularity. Stent Symmetry Index = (maximum stent diameter - minimum stent diameter) / maximum stent diameter
122347	Stent Expansion Index	Measurement of stent area relative to the reference lumen area. Stent Expansion Index = Minimum stent area / reference vessel lumen cross-sectional area
122348	Lumen Shape Index	Measurement of vessel lumen eccentricity. Lumen Shape Index = (2π * sqrt(Vessel lumen cross-sectional area / π) / Lumen Perimeter) ^{2} *Reference: Tobis & Yock, "Intravascular Ultrasound Imaging", Chapter 7*
122350	Lumen Diameter Ratio	Lumen diameter ratio = minimum vessel lumen diameter / maximum vessel lumen diameter, measured at the same cross section in the vessel. Lumen diameters are measured through the center point of the lumen, which is defined as the center of gravity of the lumen area.
122351	Stent Diameter Ratio	Stent diameter ratio = Minimum stent diameter / Maximum stent diameter, measured at the same cross section in the vessel. Stent diameters are measured through the center point of the stent, which is defined as the center of gravity of the stent area.
122352	EEM Diameter Ratio	EEM diameter ratio = minimum EEM diameter / maximum EEM diameter. Measured at the same cross section in the vessel.
122354	Plaque Burden	Fractional area within the External Elastic Membrane (EEM) occupied by atheroma. Plaque Burden = (EEM area - vessel lumen cross-sectional area) / EEM area
122355	Arc of Calcium	Angular measurement of a Calcium deposit with the apex located at the center of the lumen, which is defined as the center of gravity of the lumen area.
122356	Soft plaque	Plaque characterized by low density or echogenicity.
122357	In-Stent Neointima	Abnormal thickening of the intima within the stented segment.
122360	True Lumen	Lumen surrounded by all three layers of the vessel-intima, media, and adventitia.
122361	False Lumen	A channel, usually parallel to the true lumen, which does not communicate with the true lumen over a portion of its length.
122363	Plaque Rupture	Plaque ulceration with a tear detected in a fibrous cap.
122364	Stent Gap	Length of gap between two consecutive stents.
122367	T-1 Worst	Worst stenosis - the stenosis with the smallest lumen size within a vessel segment.
122368	T-2 Secondary	2nd most severe stenosis within a vessel segment.
122369	T-3 Secondary	3rd most severe stenosis within a vessel segment.
122370	T-4 Secondary	4th most severe stenosis within a vessel segment.

122371	EEM Volume	External Elastic Membrane (EEM) volume measured within a specified region. The EEM is a discrete interface at the border between the media and the Adventitia.
122372	Lumen Volume	Lumen volume measured within a specified region.
122374	In-Stent Neointimal Volume	The amount of plaque between the lumen and stent, within the stent region; In-stent restenosis. In-Stent Neointimal Volume = Stent Volume - Lumen Volume
122375	Native Plaque Volume	The amount of plaque between the stent and the EEM, within the stent region. Native Plaque Volume = EEM Volume - Stent Volume
122376	Total Plaque Volume	Total amount of plaque between the EEM and the Lumen, over the entire region that is measured. Total Plaque Volume = EEM Volume - Lumen Volume.
122380	Proximal Reference	Proximal reference segment measurement site. Typically the site with the largest lumen proximal to a stenosis but within the same segment (usually within 10 mm of the stenosis with no major intervening branches).
122381	Distal Reference	Distal reference segment measurement site. Typically the site with the largest lumen distal to a stenosis but within the same segment (usually within 10 mm of the stenosis with no major intervening branches).
122382	Site of Lumen Minimum	Site of the smallest lumen in a vessel, e.g., due to a stenotic lesion.
122383	Entire Pullback	Measurement region that encompasses the entire vessel imaged in a single pullback acquisition
122384	Stented Region	Measurement region occupied by the stent
122385	Proximal Stent Margin	Region starting at the proximal edge of the Stent and extending several millimeters (usually 5 mm) proximal to the Stent edge.
122386	Distal Stent Margin	Region starting at the distal edge of the Stent and extending several millimeters (usually 5 mm) distal to the Stent edge.
122387	Dissection Classification	Classification of dissections in a vessel
122388	Intra-stent Dissection	Separation of neointimal hyperplasia from stent struts, usually seen only after treatment of in-stent restenosis.
122389	Vulnerable Plaque	Plaque with a thin cap fibrous atheroma that is at increased risk of rupture and thrombosis (or re-thrombosis) and rapid stenosis progression.
122390	Eroded Plaque	Plaque erosions with no structural defect (beyond endothelial injury) or gap in the plaque.
122391	Relative Stenosis Severity	Stenosis severity classifications of multiple lesions in a vessel.
122393	Restenotic Lesion	A finding of a previously treated lesion in which stenosis has reoccurred.
122394	Fibro-Lipidic Plaque	Loosely packed bundles of collagen fibers with regions of lipid deposition present. Region is cellular and no cholesterol clefts or necrosis are present. Some macrophage infiltration. Increase in extra cellular matrix.

122395	Necrotic-Lipidic Plaque	Area within the plaque with very low echogenicity separated from the lumen and surrounded by more echogenic structures (fibrous cap). Highly lipidic necrotic region with remnants of foam cells and dead lymphocytes present. No collagen fibers are visible and mechanical integrity is poor. Cholesterol clefts and micro calcifications are visible.
122398	Intimal Dissection	Dissection limited to the intima or atheroma, and not extending to the media.
122399	Medial Dissection	Dissection in the arterial Media, extending into the media.