1	Status	Final Text				
2	Date of Last Update	2018/03/25				
3	Person Assigned	David Clunie				
4		mailto:dclunie@dclunie.com				
5	Submitter Name QIICR					
6	Submission Date 2017/02/22					
7	Correction Number CP-1699					
8	Log Summary: Match units to quantities					
9	Name of Standard					
10	PS3.16					
11	Rationale for Correction:					
12	Extend the pattern of matching units with quantities explicitly, as per Sup 169 and CP 1665					
13	Update section 7.1 with discussion of Units column.					
14	Correction Wording:					

1	6	5	

Amend DICOM PS3.16 as follows (changes to existing text are bold and underlined for additions and struckthrough for removals):

CID 4033 MR Proton Spectroscopy Metabolites

 Type: Version:

Extensible

Table CID 4033. MR Proton Spectroscopy Metabolites

8 9 10	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	<u>Units</u>
11	SRT	F-65C50	N-acetvlaspartate	115391007	C0067684	DT (ppm. UCUM. "ppm")
12	SRT	F-61080	Citrate	59351004	C0376259	DT (ppm, UCUM, "ppm")
13	SRT	F-61620	Choline	65123005	C0008405	DT (ppm, UCUM, "ppm")
14	SRT	F-61380	Creatine	14804005	C0010286	DT (ppm, UCUM, "ppm")
15	DCM	113094	Creatine and Choline			DT (ppm, UCUM, "ppm")
16	SRT	F-61760	Lactate	83036002	C0376261	DT (ppm, UCUM, "ppm")
17	SRT	F-63600	Lipid	70106000	C0023779	DT (ppm, UCUM, "ppm")
18	DCM	113095	Lipid and Lactate			DT (ppm, UCUM, "ppm")
19	DCM	113080	Glutamate and glutamine			DT (ppm, UCUM, "ppm")
20	SRT	F-64210	Glutamine	25761002	C0017797	DT (ppm, UCUM, "ppm")
21	SRT	F-64460	Tuarine	10944007	C0039350	DT (ppm, UCUM, "ppm")
22	SRT	F-61A90	Inositol	72164009	C0021547	DT (ppm, UCUM, "ppm")
23	DCM	113081	Choline/Creatine Ratio			DT (ppm, UCUM, "ppm")
24 25	DCM	113082	N-acetylaspartate/Creatine Ratio			<u>DT (ppm, UCUM, "ppm")</u>
26 27	DCM	113083	N-acetylaspartate/Choline Ratio			<u>DT (ppm, UCUM, "ppm")</u>
28 29	DCM	113096	Creatine+Choline/Citrate Ratio			<u>DT (ppm, UCUM, "ppm")</u>

CID 4107 Tracer Kinetic Model Parameters

Type: Version:

Extensible

Table CID 4107. Tracer Kinetic Model Parameters

36 37 38	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	<u>UMLS</u> <u>Concept</u> <u>Unique ID</u>	<u>Units</u>
39	DCM	126312	Ktrans			<u>DT (/min, UCUM, "/min")</u>
40	DCM	126313	kep			<u>DT (/min, UCUM, "/min")</u>
41	DCM	126314	ve			DT ({ratio}, UCUM, "ratio")
42	DCM	126330	tau_m			<u>DT (s, UCUM, "s")</u>
43	DCM	126331	vp			DT ({ratio}, UCUM, "ratio")

Note

Type:

Version:

Extensible

CID 4108 Perfusion Model Parameters

Table CID 4108. Perfusion Model Parameters

Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	<u>Units</u>
DCM	113055	Regional Cerebral Blood Flow			DT (ml/(100.ml)/min, UCUM, "ml/(100.ml)/min") DT (ml/(100.g)/min, UCUM, "ml/(100.g)/min")
DCM	126390	Regional Blood Flow			DT (ml/(100.ml)/min, UCUM, "ml/(100.ml)/min") DT (ml/(100.g)/min, UCUM, "ml/(100.g)/min")
DCM	113056	Regional Cerebral Blood Volume			DT (ml/(100.ml), UCUM, "ml/(100.ml)" DT (ml/(100.g), UCUM, "ml/(100.g)")
DCM	126391	Regional Blood Volume			DT (ml/(100.ml), UCUM, "ml/(100.ml)") DT (ml/(100.g), UCUM, "ml/(100.g)")
DCM	113052	Mean Transit Time			<u>DT (s, UCUM, "s")</u>
DCM	113069	Time To Peak			<u>DT (s, UCUM, "s")</u>
DCM	126392	Oxygen Extraction Fraction			
DCM	113084	Tmax			<u>DT (s, UCUM, "s")</u>

Note

CID 4109 Model-Independent Dynamic Contrast Analysis Parameters

Type: Version:

Extensible

Table CID 4109. Model-Independent Dynamic Contrast Analysis Parameters

37 38 39 40	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	<u>UMLS</u> Concept <u>Unique</u> <u>ID</u>	<u>Units</u>
41 42	DCM	126320	IAUC			<u>DT (mmol/I.s, UCUM,</u> " <u>mmol/I.s")</u>
43 44	DCM	126321	IAUC60			<u>DT (mmol/I.s, UCUM,</u> "mmol/I.s")
45 46	DCM	126322	IAUC90			<u>DT (mmol/I.s, UCUM,</u> "mmol/I.s")
47 48	DCM	126323	IAUC180			<u>DT (mmol/I.s, UCUM,</u> "mmol/I.s")

1 2 3 4	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	<u>Units</u>
5 6	DCM	126324	IAUCBN			<u>DT {normalized}, UCUM,</u> "normalized"
7	DCM	126325	IAUC60BN			DT {/AIF}, UCUM, "/AIF"
8	DCM	126326	IAUC90BN			DT {/AIF}, UCUM, "/AIF"
9	DCM	126327	IAUC180BN			DT {/AIF}, UCUM, "/AIF"
10	DCM	126370	Time of Peak Concentration			<u>DT (s, UCUM, "s")</u>
11 12	DCM	126372	Time of Leading Half-Peak Concentration			<u>DT (s, UCUM, "s")</u>
13	DCM	126371	Bolus Arrival Time			<u>DT (s, UCUM, "s")</u>
14	DCM	113069	Time To Peak			<u>DT (s, UCUM, "s")</u>
15 16	DCM	126374	Temporal Derivative Threshold			
17	DCM	126375	Maximum Slope			
18	DCM	126376	Maximum Difference			
19	DCM	126377	Tracer Concentration			DT (mmol/I, UCUM, "mmol/I")

CID 7180 Abstract Multi-dimensional Image Model Component Semantics

Type: Version: Extensible

Table CID 7180. Abstract Multi-dimensional Image Model Component Semantics

26 27 28	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	<u>Units</u>
29	Include CID 4033 "	MR Proton Spectros	copy Metabolites"			
30	DCM	113063	T1			<u>DT (ms, UCUM, "ms")</u>
31	DCM	113065	T2			<u>DT (ms, UCUM, "ms")</u>
32	DCM	113064	T2*			<u>DT (ms, UCUM, "ms")</u>
33	DCM	113058	Proton Density			
34 35	DCM	110800	Spin Tagging Perfusion MR Signal Intensity			
36	DCM	113070	Velocity encoded			
37	DCM	113067	Temperature encoded			
38 39	DCM	110801	Contrast Agent Angio MR Signal Intensity			
40 41	DCM	110802	Time Of Flight Angio MR Signal Intensity			
42 43	DCM	110803	Proton Density Weighted MR Signal Intensity			
44	DCM	110804	T1 Weighted MR Signal Intensity			
45	DCM	110805	T2 Weighted MR Signal Intensity			
46	DCM	110806	T2* Weighted MR Signal Intensity			

1 2 3	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	<u>Units</u>
4	Include Section CI	D 7270 "MR Diffusion	Component Semantics"			
5	Include Section CI	D 7271 "MR Diffusion	Anisotropy Indices"			
6	Include Section CI	D 7272 "MR Diffusion	Model Parameters"			
7	DCM	110807	Field Map MR Signal Intensity			
8 9	DCM	110816	T1 Weighted Dynamic Contrast Enhanced MR Signal Intensity			
10 11	DCM	110817	T2 Weighted Dynamic Contrast Enhanced MR Signal Intensity			
12 13	DCM	110818	T2* Weighted Dynamic Contrast Enhanced MR Signal Intensity			
14	DCM	110819	Blood Oxygenation Level			
15 16	DCM	110820	Nuclear Medicine Projection Activity			
17 18	DCM	110821	Nuclear Medicine Tomographic Activity			
19 20	DCM	110822	Spatial Displacement X Component			
21 22	DCM	110823	Spatial Displacement Y Component			
23 24	DCM	110824	Spatial Displacement Z Component			
25	DCM	110825	Hemodynamic Resistance			
26 27	DCM	110826	Indexed Hemodynamic Resistance			
28 29	DCM	112031	Attenuation Coefficient			<u>DT ([hnsf'U], UCUM,</u> "Hounsfield unit")
30	DCM	110827	Tissue Velocity			
31	DCM	110828	Flow Velocity			
32	SRT	P0-02241	Power Doppler	425704008	C1960437	
33	DCM	110829	Flow Variance			
34	DCM	110830	Elasticity			
35	DCM	110831	Perfusion			
36	DCM	110832	Speed of sound			
37	DCM	110833	Ultrasound Attenuation			
38	DCM	113068	Student's T-test			
39	DCM	113071	Z-score			
40	DCM	113057	R-Coefficient			
41	DCM	126220	R2-Coefficient			
42	DCM	110834	RGB R Component			
43	DCM	110835	RGB G Component			
44	DCM	110836	RGB B Component			
45	DCM	110837	YBR FULL Y Component			
46	DCM	110838	YBR FULL CB Component			

Page 6	3
--------	---

1 2 3	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	<u>Units</u>
4	DCM	110839	YBR FULL CR Component			
5	DCM	110840	YBR PARTIAL Y Component			
6	DCM	110841	YBR PARTIAL CB Component			
7	DCM	110842	YBR PARTIAL CR Component			
8	DCM	110843	YBR ICT Y Component			
9	DCM	110844	YBR ICT CB Component			
10	DCM	110845	YBR ICT CR Component			
11	DCM	110846	YBR RCT Y Component			
12	DCM	110847	YBR RCT CB Component			
13	DCM	110848	YBR RCT CR Component			
14	DCM	110849	Echogenicity			
15	DCM	110850	X-Ray Attenuation			
16	DCM	110852	MR signal intensity			
17	DCM	110853	Binary Segmentation			
18 19	DCM	110854	Fractional Probabilistic Segmentation			
20 21	DCM	110855	Fractional Occupancy Segmentation			
22	DCM	126393	R1			<u>DT (/ms, UCUM, "/ms")</u>
23	DCM	126394	R2			<u>DT (/ms, UCUM, "/ms")</u>
24	DCM	126395	R2*			<u>DT (/ms, UCUM, "/ms")</u>
25	DCM	113098	Magnetization Transfer Ratio			DT ({ratio}, UCUM, "ratio")
26	DCM	126396	Magnetic Susceptibility			DT ({ratio}, UCUM, "ratio")
27	Include Section CI	O 4107 "Tracer Kinetic	c Model Parameters"			
28	Include Section CI	0 4108 "Perfusion Mo	del Parameters"			
29	Include Section CI	0 4109 "Model-Indepe	endent Dynamic Contrast Analysis	Parameters"		
30	DCM	126400	Standardized Uptake Value			
31 32 33	DCM	126401	SUVbw			DT (g/ml{SUVbw}, UCUM, "Standardized Uptake Value body weight")
34 35 36	DCM	126402	SUVIbm			DT (g/ml{SUVIbm}, UCUM, "Standardized Uptake Value lean body mass (James)")
37 38 39 40 41 42	DCM	126406	SUVIbm(James128)			DT (g/ml{SUVIbm(James128)}, UCUM, "Standardized Uptake Value lean body mass (James 128 multiplier)")
43 44 45 46	DCM	126405	SUVIbm(Janma)			DT (g/ml{SUVIbm(Janma)}. UCUM, "Standardized Uptake Value lean body mass (Janma)")

Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	Units
DCM	126403	SUVbsa			DT (cm2/ml{SUVbsa}, UCUM, "Standardized Uptake Value body surfac area")
DCM	126404	SUVibw			DT (g/ml{SUVibw}, UCUM "Standardized Uptake Valu ideal body weight")
CID 7181 Ab	stract Multi	-dimensional Image I	Model Co	mpone	nt Units
Type: Version:	Exte 2016	nsible 1106			
Та	able CID 7181. A	bstract Multi-dimensional	Image Mode	I Compoi	nent Units
Coding Schen	ne Designator	Code Value		Cod	le Meaning
Include ???					
Include ???					
Include ???					
Include ???					
Include ???					
Include ???					
Include ???					
UCI	UM	1	no units		
UCI	UM	{ratio}	ratio		
UCI	UM	[hnsf'U]	Hounsfield	Unit	
UCI	UM	{counts}	Counts		
UC	UM	{counts}/s	Counts per	r second	
UCI	UM	[arb'U]	arbitrary ur	nit	
UCI	UM	ppm	ppm		
UCI	UM	cm/s	centimeter	/second	
UCI	UM	mm/s	millimeter/s	second	
UCI	UM	dB	decibel		
UC	UM	Cel	degrees C	elsius	
UCI	UM	ml/min	milliliter pe	r minute	
UCI	UM	ml/s	milliliter pe	r second	
UCI	UM	ms	millisecond	1	
UCI	UM	S	second		
UC	UM	Hz	Hertz		
UCI	UM	mT	milliTesla		
UC	UM	{Particles}/[100]g{Tissue}	number pa	rticles per 1	00 gram of tissue
UC	UM	mm2/s	square mil	limeter per s	second
UCI	UM	s/mm2	second per	r square mil	limeter
UC	UM	ml/[100]a/min	milliliter pe	r 100 gram	per minute

Coding Sche	me Designator	Code Value		Coc	de Meaning	
UC	CUM	ml/[100]ml	millilit	er per 100 millilit	er	
UC	UM	mmol/kg{WetWei	ght} millim	oles per kg wet	weight	
UC	UM	/min	/min			
UC	UM	/s	/s			
CID 7270 M Resources: ype: /ersion: JID:	R Diffusion (HTM Exte 2017 1.2.4 Table	Component Sem IL FHIR JSON FHIR XM ensible 70413 340.10008.6.1.1165 CID 7270. MR Diffusi	antics L IHE SVS XML on Componen	XML		
Coding Scheme Designator	Code Value	Code Meaning	SNOMED Concept	CT UMLS ID Concept Unique ID	Units	
DCM	113043	Diffusion weighted			DT (1, UCUM, "no units")	
DCM	110810	Volumetric Diffusion Dxx Component			DT (1, UCUM, "no units")	
DCM	110811	Volumetric Diffusion Dxy Component			DT (1, UCUM, "no units"	
DCM	110812	Volumetric Diffusion Dxz Component			DT (1, UCUM, "no units")	
DCM	110813	Volumetric Diffusion Dyy Component			DT (1, UCUM, "no units")	
DCM	110814	Volumetric Diffusion Dyz Component			DT (1, UCUM, "no units")	
DCM	110815	Volumetric Diffusion Dzz Component			DT (1, UCUM, "no units")	
CED 7271 MI Resources: Ype: /ersion: JID:	R DITTUSION A HTM Exte 2017 1.2.8 Tab	Anisotropy indic IL FHIR JSON FHIR XM ensible 70413 340.10008.6.1.1166 Ie CID 7271. MR Diffu	es L IHE SVS XML sion Anisotro	by Indices	1	
Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	Units	
DCM	110808	Fractional Anisotropy			DT ({0:1}, UCUM, "range 0:1")	
DCM	110809	Relative Anisotropy			DT ({ratio}, UCUM, "ratio	
DCM	113288	Volume Ratio			DT ({0:1}, UCUM, "range	

Type:	Extensible
Version:	20170413
UID:	1.2.840.10008.6.1.1167

Table CID 7272. MR Diffusion Model Parameters

8 9 10	Coding Scheme Designator	Code Value	Code Meaning	SNOMED-CT Concept ID	UMLS Concept Unique ID	Units
11 12	DCM	113041	Apparent Diffusion Coefficient		C3890194	DCID 7277 "Units of Diffusion Rate Area Over Time"
13 14	DCM	113289	Diffusion Coefficient			DCID 7277 "Units of Diffusion Rate Area Over Time"
15 16	DCM	113290	Mono-exponential Apparent Diffusion Coefficient			DCID 7277 "Units of Diffusion Rate Area Over Time"
17 18	DCM	113291	Slow Diffusion Coefficient			DCID 7277 "Units of Diffusion Rate Area Over Time"
19 20	DCM	113292	Fast Diffusion Coefficient			DCID 7277 "Units of Diffusion Rate Area Over Time"
21 22	DCM	113293	Fast Diffusion Coefficient Fraction			DT ({0:1}, UCUM, "range 0:1")
23 24	DCM	113294	Kurtosis Diffusion Coefficient			DCID 7277 "Units of Diffusion Rate Area Over Time"
25 26	DCM	113295	Gamma Distribution Scale Parameter			DT (1, UCUM, "no units")
27 28	DCM	113296	Gamma Distribution Shape Parameter			DT (1, UCUM, "no units")
29	DCM	113297	Gamma Distribution Mode			DT (1, UCUM, "no units")
30 31	DCM	113298	Distributed Diffusion Coefficient			DCID 7277 "Units of Diffusion Rate Area Over Time"
32	DCM	113299	Anomalous Exponent Parameter			DT ({0:1}, UCUM, "range 0:1")

CID 7277 Units of Diffusion Rate Area Over Time

35	Resources:	HTML FHIR JSON FHIR XML IHE SVS XML
36	Туре:	Extensible
39	Version:	20170413
40	UID:	1.2.840.10008.6.1.1172

Table CID 7277. Units of Diffusion Rate Area Over Time

43	Coding Scheme Designator	Code Value	Code Meaning
44	UCUM	mm2/s	mm2/s
45	UCUM	um2/ms	um2/ms
46	UCUM	um2/s	um2/s
47	UCUM	10-6.mm2/s	10-6.mm2/s

Note

D DICOM Controlled Terminology Definitions (Normative)

Table D-1. DICOM Controlled Terminology Definitions

Code Value	Code Meaning	Definition	Notes
110800	Spin Tagging Perfusion MR Signal Intensity	Signal intensity of a Spin tagging Perfusion MR image. Spin tagging is a technique for the measurement of blood perfusion, based on magnetically labeled arterial blood water as an endogenous tracer.	
110801	Contrast Agent Angio MR Signal Intensity	Signal intensity of a Contrast Agent Angio MR image.	
110802	Time Of Flight Angio MR Signal Intensity	Signal intensity of a Time-of-flight (TOF) MR image. Time-of-flight (TOF) is based on the phenomenon of flow-related enhancement of spins entering into an imaging slice. As a result of being unsaturated, these spins give more signal that surrounding stationary spins.	
110803	Proton Density Weighted MR Signal Intensity	Signal intensity of a Proton Density Weighted MR image. All MR images have intensity proportional to proton density. Images with very little T1 or T2 weighting are called 'PD-weighted'.	
110804	T1 Weighted MR Signal Intensity	Signal intensity of T1 Weighted MR image. A T1 Weighted MR image is created typically by using short TE and TR times.	
110805	T2 Weighted MR Signal Intensity	Signal intensity of a T2 Weighted MR image. T2 Weighted image contrast state is approached by imaging with a TR long compared to tissue T1 (to reduce T1 contribution to image contrast) and a TE between the longest and shortest tissue T2s of interest.	
110806	T2* Weighted MR Signal Intensity	Signal intensity of a T2* Weighted MR image. The T2* phenomenon results from molecular interactions (spin spin relaxation) and local magnetic field non-uniformities, which cause the protons to precess at slightly different frequencies.	
110807	Field Map MR Signal Intensity	Signal intensity of a Field Map MR image. A Field Map MR image provides a direct measure of the B_0 inhomogeneity at each point in the image.	
110808	Fractional Anisotropy	Coefficient reflecting the fractional anisotropy of the tissues, derived from a diffusion weighted MR image. Fractional anisotropy is proportional to the square root of the variance of the Eigen values divided by the square root of the squares of the Eigen values.	
110809	Relative Anisotropy	Coefficient reflecting the relative anisotropy of the tissues, derived from a diffusion weighted MR image.	
110810	Volumetric Diffusion Dxx Component	Dxx Component of the diffusion tensor, quantifying the molecular mobility along the X axis.	
110811	Volumetric Diffusion Dxy Component	Dxy Component of the diffusion tensor, quantifying the correlation of molecular displacements in the X and Y directions.	
110812	Volumetric Diffusion Dxz Component	Dxz Component of the diffusion tensor, quantifying the correlation of molecular displacements in the X and Z directions.	
110813	Volumetric Diffusion Dyy Component	Dyy Component of the diffusion tensor, quantifying the molecular mobility along the Y axis.	
110814	Volumetric Diffusion Dyz Component	Dyz Component of the diffusion tensor, quantifying the correlation of molecular displacements in the Y and Z directions.	
110815	Volumetric Diffusion Dzz Component	Dzz Component of the diffusion tensor, quantifying the molecular mobility along the Z axis.	

Code Value	Code Meaning	Definition	Notes
110816	T1 Weighted Dynamic Contrast Enhanced MR Signal Intensity	Signal intensity of a T1 Weighted Dynamic Contrast Enhanced MR image. A T1 Weighted Dynamic Contrast Enhanced MR image reflects the dynamics of diffusion of the exogenous contrast media from the blood pool into the extra vascular extracellular space (EES) of the brain at a rate determined by the blood flow to the tissue, the permeability of the Brain Blood Barrier (BBB), and the surface area of the perfusing vessels.	
110817	T2 Weighted Dynamic Contrast Enhanced MR Signal Intensity	Signal intensity of a T2 Weighted Dynamic Contrast Enhanced MR image. A T2 Weighted Dynamic Contrast Enhanced MR image reflects the T2 of tissue decrease as the Gd contrast agent bolus passes through the brain.	
110818	T2* Weighted Dynamic Contrast Enhanced MR Signal Intensity	Signal intensity of a T2* Weighted Dynamic Contrast Enhanced MR image. A T2* Weighted Dynamic Contrast Enhanced MR image reflects the T2* of tissue decrease as the Gd contrast agent bolus passes through the brain.	
110819	Blood Oxygenation Level	Signal intensity of a Blood Oxygenation Level image. BOLD imaging is sensitive to blood oxygenation (but also to cerebral blood flow and volume). This modality is essentially used for detecting brain activation (functional MR).	
110820	Nuclear Medicine Projection Activity	Accumulated decay event counts in a nuclear medicine projection image.	
110821	Nuclear Medicine Tomographic Activity	Accumulated decay event counts in a Nuclear Medicine Tomographic image (including PET).	
110822	Spatial Displacement X Component	Spatial Displacement along axis X of a non linear deformable spatial registration image. The X axis is defined in reference to the patient's orientation, and is increasing to the left hand side of the patient.	
110823	Spatial Displacement Y Component	Spatial Displacement along axis Y of a non linear deformable spatial registration image. The Y axis is defined in reference to the patient's orientation, and is increasing to the posterior side of the patient.	
110824	Spatial Displacement Z Component	Spatial Displacement along axis Z of a Non linear deformable spatial registration image. The Z axis is defined in reference to the patient's orientation, and is increasing toward the head of the patient.	
110825	Hemodynamic Resistance	Measured resistance to the flow of blood. E.g., through the vasculature or through a heart value.	
110826	Indexed Hemodynamic Resistance	Measured resistance to the flow of blood. E.g., through the vasculature or through a heart value, normalized to a particular indexed scale.	
110827	Tissue Velocity	Velocity of tissue based on Doppler measurements.	
110828	Flow Velocity	Velocity of blood flow based on Doppler measurements.	
110829	Flow Variance	Statistical variance of blood velocity relative to mean.	
110830	Elasticity	Scalar value related to the elastic properties of the tissue.	
110831	Perfusion	Scalar value related to the volume of blood perfusing into tissue.	
110832	Speed of sound	Speed of sound in tissue.	
110833	Ultrasound Attenuation	Reduction in strength of ultrasound signal as the wave.	
110834	RGB R Component	Red component of a true color image (RGB).	
110835	RGB G Component	Green component of a true color image (RGB).	
110836	RGB B Component	Blue component of a true color image (RGB).	
110837	YBR FULL Y Component	Y (Luminance) component of a YBR FULL image, as defined in JPEG 2000.	
110838	YBR FULL CB Component	CB (Blue chrominance) component of a YBR FULL image, as defined in JPEG 2000.	

	Code Meaning	Definition	Notes
110839	YBR FULL CR Component	CR (Red chrominance) component of a YBR FULL image, as defined in JPEG 2000.	
110840	YBR PARTIAL Y Component	Y (Luminance) component of a YBR PARTIAL image, as defined in JPEG 2000.	
110841	YBR PARTIAL CB Component	CB (Blue chrominance) component of a YBR PARTIAL image, as defined in JPEG 2000.	
110842	YBR PARTIAL CR Component	CR (Red chrominance) component of a YBR PARTIAL image, as defined in JPEG 2000.	
110843	YBR ICT Y Component	Y (Luminance) component of a YBR ICT image (Irreversible Color Transform), as defined in JPEG 2000.	
110844	YBR ICT CB Component	CB (Blue chrominance) component of a YBR ICT image (Irreversible Color Transform), as defined in JPEG 2000.	
110845	YBR ICT CR Component	CR (Red chrominance) component of a YBR ICT image (Irreversible Color Transform), as defined in JPEG 2000.	
110846	YBR RCT Y Component	Y (Luminance) component of a YBR RCT image (Reversible Color Transform), as defined in JPEG 2000.	
110847	YBR RCT CB Component	CB (Blue chrominance) component of a YBR RCT image (Reversible Color Transform), as defined in JPEG 2000.	
110848	YBR RCT CR Component	CR (Red chrominance) component of a YBR RCT image (Reversible Color Transform), as defined in JPEG 2000.	
110849	Echogenicity	The ability of a material to create an ultrasound return echo.	
110850	X-Ray Attenuation	Decrease in the number of photons in an X-Ray beam due to interactions with the atoms of a material substance. Attenuation is due primarily to two processes, absorption and scattering.	
110851	X-Ray Attenuation Coefficient	Coefficient that describes the fraction of a beam of X-Rays or gamma rays that is absorbed or scattered per unit thickness of the absorber. This value basically accounts for the number of atoms in a cubic cm volume of material and the probability of a photon being scattered or absorbed from the nucleus or an electron of one of these atoms.	Retired. Replace (112031 DCM, "Attenua Coefficie
110852	MR signal intensity	Signal intensity of an MR image, not otherwise specified.	
110853	Binary Segmentation	Binary value denoting that the segmented property is present.	
110854	Fractional Probabilistic Segmentation	Probability, defined as a percentage, that the segmented property occupies the spatial area defined by the voxel.	
110855	Fractional Occupancy Segmentation	Percentage of the voxel area occupied by the segmented property.	
110856	Linear Displacement	Spatial dimension, denoting a linear displacement.	
110857	Photon Energy	Dimension denoting the energy (frequency or wavelength) of photons.	
110858	Time	Dimension used to sequence events, to compare the duration of events and the intervals between events.	
110859	Angle	Spatial dimension, denoting an angle.	
112031	Attenuation Coefficient	A quantitative numerical statement of the relative attenuation of the X-Ray beam at a specified point. Coefficient that describes the fraction of a beam of X-Rays or gamma rays that is absorbed or scattered per unit thickness of the absorber. This value basically accounts for the number of atoms in a cubic cm volume of material and the probability of a photon being scattered or absorbed from the nucleus or an electron of one of these atoms. Usually expressed in Hounsfield units [referred to as CT Number	

1	Code Value	Code Meaning	Definition	Notes
<u>2</u> 3	112032	Threshold Attenuation Coefficient	An X-Ray attenuation coefficient that is used as a threshold. E.g., in calcium scoring.	
5	113041	Apparent Diffusion Coefficient	Values are derived by calculation of the apparent diffusion coefficient.	
6	113043	Diffusion weighted	Values are derived by calculation of the diffusion weighting.	
,	113052	Mean Transit Time	The time required for blood to pass through a region of tissue.	
9 0 0	113055	Regional Cerebral Blood Flow	The <u>absolute</u> flow rate of blood perfusing a region of the brain as volume per mass per unit of time. <u>The mass divisor may be approximated by</u> <u>a measurement of volume assuming a tissue density of 1.</u>	
2 5 4	113056	Regional Cerebral Blood Volume	The absolute volume of blood perfusing a region of brain as as volume per mass. The mass divisor may be approximated by a measurement of volume assuming a tissue density of 1.	
6	113057	R-Coefficient	Correlation Coefficient, r.	
7	113058	Proton Density	Values are derived by calculating proton density values.	
8	113059	Signal Change	Values are derived by calculating signal change values.	
9	113060	Signal to Noise	Values are derived by calculating the signal to noise ratio.	
20 21	113061	Standard Deviation	Values are derived by calculating the standard deviation of two or more images.	
2	113062	Pixel by pixel subtraction	Values are derived by the pixel by pixel subtraction of two images.	
23 24 25	113063	T1	The time constant for the decay of longitudinal magnetization caused by spin-lattice relaxation. The inverse of the longitudinal relaxation rate constant, i.e., T1 = 1/R1.	
26 27 28	113064	T2*	The time constant for the decay of transverse magnetization caused by a combination of spin-spin relaxation and magnetic field inhomogeneity. The inverse of the transverse relaxation rate constant, i.e., $T2^* = 1/R2^*$.	
29 80 81	113065	T2	The time constant for the decay of transverse magnetization caused by spin-spin relaxation. The inverse of the transverse relaxation rate constant, i.e., $T2 = 1/R2$.	
32	113066	Time Course of Signal	Values are derived by calculating values based on the time course of signal.	
3	113067	Temperature encoded	Values are derived by calculating values based on temperature encoding.	
4 5	113068	Student's T-Test	Values are derived by calculating the value of the Student's T-Test statistic from multiple image samples.	
6 7	113069	Time To Peak	The time from the start of the contrast agent injection to the maximum enhancement value.	
8 9	113070	Velocity encoded	Values are derived by calculating values based on velocity encoded. E.g., phase contrast.	
0 1	113071	Z-Score	Values are derived by calculating the value of the Z-Score statistic from multiple image samples.	
2 3	113080	Glutamate and glutamine	For single-proton MR spectroscopy, the resonance peak corresponding to glutamate and glutamine.	
.4 .5	113081	Choline/Creatine Ratio	For single-proton MR spectroscopy, the ratio between the Choline and Creatine resonance peaks.	
6 17	113082	N-acetylaspartate /Creatine Ratio	For single-proton MR spectroscopy, the ratio between the N-acetylaspartate and Creatine resonance peaks.	
18 19	113083	N-acetylaspartate /Choline Ratio	For single-proton MR spectroscopy, the ratio between the N-acetylaspartate and Choline resonance peaks.	

Code Value	Code Meaning	Definition	Note
113084	Tmax	The time delay to the maximum of the residue function after deconvolution.	
		Shih LC, Saver JL, Alger JR, Starkman S, Leary MC, Vinuela F, et al. Perfusion-Weighted Magnetic Resonance Imaging Thresholds Identifying Core, Irreversibly Infarcted Tissue. Stroke. 2003 Jun 1;34(6):1425–30. doi:10.1161/01.STR.0000072998.70087.E9 http://stroke.ahajournals.org/ content/34/6/1425.abstract	
		Østergaard L, Weisskoff RM, Chesler DA, Gyldensted C, Rosen BR. High resolution measurement of cerebral blood flow using intravascular tracer bolus passages. Part I: Mathematical approach and statistical analysis. Magnetic Resonance in Medicine. 1996;36(5):715–25. doi:10.1002/mrm.1910360510 http://onlinelibrary.wiley.com/doi/10.1002/ mrm.1910360510/abstract	
113094	Creatine and Choline	For single-proton MR spectroscopy, the resonance peak corresponding to creatine and choline.	
113095	Lipid and Lactate	For single-proton MR spectroscopy, the resonance peak corresponding to lipid and lactate.	
113096	Creatine+Choline/ Citrate Ratio	For single-proton MR spectroscopy, the ratio between the Choline and Creatine resonance peak and the Citrate resonance peak.	
113097	Multi-energy proportional weighting	Image pixels created through proportional weighting of multiple acquisitions at distinct X-Ray energies.	
113098	Magnetization Transfer Ratio	Magnetization Transfer Ratio (MTR) is the ratio of magnetization transfer, Mo - Ms/Mo, where Ms represents the magnitude of signal of tissues with the saturation pulse used to saturate macromolecular protons on, and Mo is the magnitude of signal without saturation.	
		See Dousset V, Grossman RI, Ramer KN, Schnall MD, Young LH, Gonzalez-Scarano F, et al. Experimental allergic encephalomyelitis and multiple sclerosis: lesion characterization with magnetization transfer imaging. Radiology. 1992 Feb 1;182(2):483–91. http://dx.doi.org/10.1148/radiology.182.2.1732968	
126220	R2-Coefficient	Coefficient of determination, R ² . An indication of goodness of fit.	
126312	Ktrans	K ^{trans} , the volume transfer constant of a tracer diffusion kinetic model, specifically the volume transfer constant between blood plasma and extravascular extracellular space (EES)	
		See Tofts et al, "Estimating Kinetic Parameters From Dynamic Contrast-Enhanced T1-Weighted MRI of a Diffusable Tracer: Standardized Quantities and Symbols", Journal of Magnetic Resonance Imaging, vol. 10, pp. 223–232, 1999.	
126313	kep	k _{ep} , the rate constant between extravascular extracellular space (EES) and blood plasma	
		See Tofts et al, "Estimating Kinetic Parameters From Dynamic Contrast-Enhanced T1-Weighted MRI of a Diffusable Tracer: Standardized Quantities and Symbols", Journal of Magnetic Resonance Imaging, vol. 10, pp. 223–232, 1999.	
126314	ve	$v_{\rm e},$ the fractional (not absolute) volume of extravascular extracellular space (EES) per unit volume of tissue	
		See Tofts et al, "Estimating Kinetic Parameters From Dynamic Contrast-Enhanced T1-Weighted MRI of a Diffusable Tracer: Standardized Quantities and Symbols", Journal of Magnetic Resonance Imaging, vol. 10, pp. 223–232, 1999.	

-	\sim
5	u
\sim	0

1	
2	
3	
4	
5	
6	
7	
8	
9	
19	
13	
14	
10	
19	
19	
20	
22	
23	
25	
29	
28	
30	
31	
32	
33	
34	
30	
30	
38	
39	
40	
41	
42	
43	
44 45	
46	
47	
48	
49	
50	
51	
52 53	
54	
55	
56	
57	

Code Value	Code Meaning	Definition	Notes
126320	IAUC	The initial area under the contrast agent concentration-time curve	
126321	IAUC60	The initial area under the contrast agent concentration-time curve at 60 seconds after the onset time	
126322	IAUC90	The initial area under the contrast agent concentration-time curve at 90 seconds after the onset time	
126323	IAUC180	The initial area under the contrast agent concentration-time curve at 180 seconds after the onset time	
126324	IAUCBN	The initial area under the contrast agent concentration–time curve, normalized with the corresponding arterial input function, such that $IAUC_{BN} = IAUC / IAUC_{AIF}$.	
126325	IAUCBN60	The initial area under the contrast agent concentration–time curve at 60 seconds after the onset time, normalized with the corresponding arterial input function, such that $IAUC60_{BN} = IAUC60 / IAUC60_{AIF}$.	
126326	IAUCBN90	The initial area under the contrast agent concentration–time curve at 90 seconds after the onset time, normalized with the corresponding arterial input function, such that $IAUC90_{BN} = IAUC90 / IAUC90_{AIF}$.	
126327	AUCBN180	The initial area under the contrast agent concentration–time curve at 180 seconds after the onset time, normalized with the corresponding arterial input function, such that $IAUC180_{BN} = IAUC180 / IAUC180_{AIF}$.	
126330	tau_m	τ_m . The mean intracellular water lifetime (τ_i). Used in the Shutter-Speed Model (SSM) of tracer kinetics.	
126331	νр	$v_p.$ The fractional (not absolute) blood plasma volume per unit volume of tissue.	
		See Tofts et al, "Estimating Kinetic Parameters From Dynamic Contrast-Enhanced T1-Weighted MRI of a Diffusable Tracer: Standardized Quantities and Symbols", Journal of Magnetic Resonance Imaging, vol. 10, pp. 223–232, 1999.	
126370	Time of Peak Concentration	The time at which the concentration-time curve achieves its peak for the first time. Used as a concept name for a value or as a method. E.g., used as a method of calculation for BAT. See Shpilfoygel Med Phys 2008. doi: 10.1118/1.1288669	
126371	Bolus Arrival Time	The nominal time at which arrival of a contrast bolus is detected, which is used as a reference point for subsequent calculations. Used as a concept name for a value or as a method. No specific computational method is implied by this general definition. Abbreviated BAT.	
126372	Time of Leading Half-Peak Concentration	The time at which the concentration-time curve achieves half of its peak density for the first time. Used as a concept name for a value or as a method. E.g., used as a method of calculation for BAT. See Shpilfoygel Med Phys 2008. doi: 10.1118/1.1288669	
126374	Temporal Derivative Threshold	A threshold applied to the temporal derivative of the concentration-time curve. E.g., used to establish BAT. See Shpilfoygel Med Phys 2008. doi: 10.1118/1.1288669	
126375	Maximum Slope	The maximum rate of signal intensity change within a measured region of a time-activity curve. See Boonsirikamchai, Piyaporn, Harmeet Kaur, Deborah A. Kuban, Edward Jackson, Ping Hou, and Haesun Choi. "Use of Maximum Slope Images Generated From Dynamic Contrast-Enhanced MRI to Detect Locally Recurrent Prostate Carcinoma After Prostatectomy: A Practical Approach." American Journal of Roentgenology 198, no. 3 (March 1, 2012): W228–W236. doi:10.2214/AJR.10.6387.	

1	Code Value	Code Meaning	Definition	Notes
2 3 4 5 6 7 8	126376	Maximum Difference	The maximum degree of signal intensity change within a measured region of a time-activity curve. See Boonsirikamchai, Piyaporn, Harmeet Kaur, Deborah A. Kuban, Edward Jackson, Ping Hou, and Haesun Choi. "Use of Maximum Slope Images Generated From Dynamic Contrast-Enhanced MRI to Detect Locally Recurrent Prostate Carcinoma After Prostatectomy: A Practical Approach." American Journal of Roentgenology 198, no. 3 (March 1, 2012): W228–W236. doi:10.2214/AJR.10.6387.	
9 10	126377	Tracer Concentration	Tracer concentration in tissue. E.g., in a DCE-MR experiment, the concentration of contrast agent in mmol/l.	
11 12 13 14	126380	Contrast Longitudinal Relaxivity	The degree to which a paramagnetic contrast agent can enhance the proton longitudinal relaxation rate constant (R1, 1/T1), normalized to the concentration of the contrast agent. Also referred to as r1. Typically expressed in units of l/mmol/s.	
15 16 17	126390	Regional Blood Flow	The <u>absolute</u> flow rate of blood perfusing a region as volume per mass per unit of time. <u>The mass divisor may be approximated by a</u> <u>measurement of volume assuming a tissue density of 1.</u>	
18 19 20	126391	Regional Blood Volume	The absolute volume of blood perfusing a region as volume per mass. The mass divisor may be approximated by a measurement of volume assuming a tissue density of 1.	
21 22 23 24 25 26	126392	Oxygen Extraction Fraction	The percent of the oxygen removed from the blood by tissue during its passage through the capillary network. For example, as measured by blood oxygenation level dependent (BOLD) MR. See He, Xiang, and Dmitriy A. Yablonskiy. "Quantitative BOLD: Mapping of Human Cerebral Deoxygenated Blood Volume and Oxygen Extraction Fraction: Default State." Magnetic Resonance in Medicine 57, no. 1 (2007): 115–26.	
27 28 29	126393	R1	The longitudinal relaxation rate constant for the decay of longitudinal magnetization caused by spin-lattice relaxation. The inverse of longitudinal relaxation time, i.e., $R1 = 1/T1$.	
30 31 32	126394	R2	The transverse relaxation rate constant for the decay of transverse magnetization caused by spin-spin relaxation. The inverse of transverse relaxation time, i.e., $R2 = 1/T2$.	
33 34 35 36	126395	R2*	The transverse relaxation rate constant for the decay of transverse magnetization caused by a combination of spin-spin relaxation and magnetic field inhomogeneity. The inverse of transverse relaxation time, i.e., $R2^* = 1/T2^*$.	
37 38 39 40	126396	Magnetic Susceptibility	Magnetic Susceptibility is a measure of the amount of magnetization induced in a material when placed in an external magnetic field. It is the quantity encoded as the voxel intensity in Quantitative Susceptibility Map (QSM) images.	
41 42			It is a dimensionless quantity, usually recorded with units of parts per millions (ppm).	
43 44 45 46			See Liu T, Wisnieff C, Lou M, Chen W, Spincemaille P, Wang Y. Nonlinear formulation of the magnetic field to source relationship for robust quantitative susceptibility mapping. Magnetic Resonance in Medicine. 2013;69(2):467–76. http://dx.doi.org/10.1002/mrm.24272.	
47 48 49			See Wang Y, Liu T. Quantitative susceptibility mapping (QSM): Decoding MRI data for a tissue magnetic biomarker. Magnetic Resonance in Medicine. 2015;73(1):82–101. http://dx.doi.org/10.1002/mrm.25358.	

Code Value	Code Meaning	Definition	Notes
126400	Standardized Uptake Value	A ratio of locally measured radioactivity concentration versus the injected radioactivity distributed evenly throughout the whole body.	
		This general concept encompasses all specific methods of calculating the whole body volume of distribution, such as using body weight, lean body mass, body surface area, etc.	
126401	SUVbw	Standardized Uptake Value calculated using body weight. The patient size correction factor for males and females is body weight.	
		Defined in Sugawara et al. <i>Reevaluation of the Standardized Uptake Value for FDG: Variations with Body Weight and Methods for Correction</i> .Radiology, 1999 at http://radiology.rsna.org/content/213/2/521	
126402	SUVIbm	Standardized Uptake Value calculated using lean body mass by James method. The patient size correction factor for males is 1.10 * weight - (120 or 128) * (weight/height) ^2, and for females is 1.07 * weight - 148 * (weight/height) ^2.	
		Defined in Sugawara et al. <i>Reevaluation of the Standardized Uptake Value for FDG: Variations with Body Weight and Methods for Correction</i> .Radiology, 1999 at http://radiology.rsna.org/content/213/2/521, except that either 120 or 128 may be used as the multiplier parameter for males).	
		Unfortunately, Sugawara used a parameter of 120 rather than 128, propagating an error in Morgan DJ, Bray KM. Lean Body Mass as a Predictor of Drug Dosage: Implications for Drug Therapy. Clinical Pharmacokinetics. 1994;26(4):292–307, which misquoted the original LBM definition that used 128 in James WPT, Waterlow JC. Research on Obesity: A Report of the DHSS/MRC Group. London: Her Majesty's Stationery Office; 1976. Implementations differ in whether they have used 120 or 128 when using this code. See Kelly M. SUV: Advancing Comparability and Accuracy. Siemens; 2009. Available from: http://www.mpcphysics.com/ documents/SUV_Whitepaper_Final_11.17.09_59807428_2.pdf.	
126403	SUVbsa	Standardized Uptake Value calculated using body surface area. The patient size correction factor for males and females is weight^ 0.425 * height^0.725 * 0.007184. Defined in Sugawara et al. <i>Reevaluation of the Standardized Uptake Value</i>	
		for FDG: Variations with Body Weight and Methods for Correction.Radiology, 1999 at http://radiology.rsna.org/content/213/2/521	
126404	SUVibw	Standardized Uptake Value calculated using ideal body weight. The patient size correction factor for males is 48.0 + 1.06 * (height - 152) and for females is 45.5 + 0.91 * (height - 152).	
		Defined in Sugawara et al. <i>Reevaluation of the Standardized Uptake Value for FDG: Variations with Body Weight and Methods for Correction</i> .Radiology, 1999 at http://radiology.rsna.org/content/213/2/521	

1
2
3
4
5
6
7
8
9
10
11
12
13
11
14

Code Value	Code Meaning	Definition	Notes
126405	SUVIbm(Janma)	Standardized Uptake Value calculated using lean body mass by Janmahasatian method. The patient size correction factor for males is 9.27E3 * weight / (6.68E3 + 216 * weight / (height^2)) and for females is 9.27E3 * weight / (8.78E3 + 244 * weight / (height^2)). Defined in <i>Janmahasatian et al. Quantification of Lean Bodyweight. Clin</i> <i>Pharmacokinet. 2005 Oct 1;44(10):1051–65.</i> at http://dx.doi.org/10.2165/	
		00003088-200544100-00004 and its role in SUVIbm(Janma) calculation is discussed in <i>Tahari et al. Optimum Lean Body Formulation for Correction</i> <i>of Standardized Uptake Value in PET Imaging. Journal of Nuclear Medicine.</i> <i>2014 Sep 1;55(9):1481–4.</i> at http://jnm.snmjournals.org/content/55/9/1481.	
126406	SUVIbm(James128)	Standardized Uptake Value calculated using lean body mass by James method, using the originally published 128 multiplier for males. The patient size correction factor for males is 1.10 * weight - 128) * (weight/height) ^2, and for females is 1.07 * weight - 148 * (weight/height) ^2.	