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Person Assigned	David Clunie mailto:dclunie@dclunie.com
Submitter Name	Andriy Fedorov mailto:fedorov@bwh.harvard.edu
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Correction Number CP-1390
Log Summary: Generalize Concepts in Abstract Multi-dimensional Image Model Component Semantics
Name of Standard PS3.16 2014b
Rationale for Correction: Many of the concepts for quantities that are present in PS3.16 "Abstract Multi-dimensional Image Model Component Semantics", which are used in PS3.19 Application Hosting for the Abstract Model, are potentially reusable as quantities and dimensions in other use cases. The concepts listed are inconsistent with respect to whether or not they define the semantics specific to an image or "map" or are entirely general. Amend their definitions to replace "the image is" with "the values are". Also, where there is the occasional inconsistent use of the word "map" in the name and defintions of these concepts it is removed, since conceptually the values represented when in an imahe matrix are "maps" yet this limits the reuse of the same concept for a single value extracted from an image (such as in a measurement in an ROI).
Editor's Notes:
Correction Wording:

Amend DICOM PS3.16 - Content Mapping Resource - Context Groups to amend the following context groups:

CID 4033 MR Proton Spectroscopy Metabolites

Type: **Extensible**
Version: **20070122**

Table CID 4033. MR Proton Spectroscopy Metabolites

Coding Scheme Designator	Code Value	Code Meaning
SRT	F-6175A	N-acetylaspartate
SRT	F-61080	Citrate
SRT	F-61620	Choline
SRT	F-61380	Creatine
DCM	113094	Creatine and Choline
SRT	F-61760	Lactate
SRT	F-63600	Lipid
DCM	113095	Lipid and Lactate
DCM	113080	Glutamate and glutamine
SRT	F-64210	Glutamine
SRT	F-64460	Tuarine
SRT	F-61A90	Inositol
DCM	113081	Choline/Creatine Ratio
DCM	113082	N-acetylaspartate/Creatine Ratio
DCM	113083	N-acetylaspartate/Choline Ratio
DCM	113096	Creatine+Choline/Citrate Ratio

Note

For the purpose of this context group, where possible, the resonance peak in the spectrum corresponding to a particular metabolite is described using the concept from SNOMED for the substance corresponding to the metabolite. E.g., the code used for "lipid" is the code for "lipid (substance) ", as this concept is effectively post-coordinated by its use in the Metabolite Map Code Sequence (0018,9083) to mean "lipid resonance peaks in MR spectroscopy".

CID 7180 Abstract Multi-dimensional Image Model Component Semantics

Type: **Extensible**
Version: **~~20100825~~yyyymmdd**

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

Coding Scheme Designator	Code Value	Code Meaning
Include CID 4033 "MR Proton Spectroscopy Metabolites"		
DCM	113063	T1~~ **Map**~~
DCM	113065	T2~~ **Map**~~
DCM	113064	T2*~~ **Map**~~
DCM	113058	Proton Density~~ **Map**~~
DCM	110800	Spin Tagging Perfusion MR Signal Intensity
DCM	113070	Velocity encoded
DCM	113067	Temperature encoded

Coding Scheme Designator	Code Value	Code Meaning
DCM	110801	Contrast Agent Angio MR Signal Intensity
DCM	110802	Time Of Flight Angio MR Signal Intensity
DCM	110803	Proton Density Weighted MR Signal Intensity
DCM	110804	T1 Weighted MR Signal Intensity
DCM	110805	T2 Weighted MR Signal Intensity
DCM	110806	T2* Weighted MR Signal Intensity
DCM	113043	Diffusion weighted
DCM	110807	Field Map MR Signal Intensity
DCM	110808	Fractional Anisotropy
DCM	110809	Relative Anisotropy
DCM	113041	Apparent Diffusion Coefficient
DCM	110810	Volumetric Diffusion Dxx Component
DCM	110811	Volumetric Diffusion Dxy Component
DCM	110812	Volumetric Diffusion Dxz Component
DCM	110813	Volumetric Diffusion Dyy Component
DCM	110814	Volumetric Diffusion Dyz Component
DCM	110815	Volumetric Diffusion Dzz Component
DCM	110816	T1 Weighted Dynamic Contrast Enhanced MR Signal Intensity
DCM	110817	T2 Weighted Dynamic Contrast Enhanced MR Signal Intensity
DCM	110818	T2* Weighted Dynamic Contrast Enhanced MR Signal Intensity
DCM	113055	Regional Cerebral Blood Flow
DCM	113056	Regional Cerebral Blood Volume
DCM	113052	Mean Transit Time
DCM	113069	Time To Peak~~ map~~
DCM	110819	Blood Oxygenation Level
DCM	110820	Nuclear Medicine Projection Activity
DCM	110821	Nuclear Medicine Tomographic Activity
DCM	110822	Spatial Displacement X Component
DCM	110823	Spatial Displacement Y Component
DCM	110824	Spatial Displacement Z Component
DCM	110825	Hemodynamic Resistance
DCM	110826	Indexed Hemodynamic Resistance
DCM	112031	Attenuation Coefficient
DCM	110827	Tissue Velocity
DCM	110828	Flow Velocity
SRT	P0-02241	Power Doppler
DCM	110829	Flow Variance
DCM	110830	Elasticity
DCM	110831	Perfusion
DCM	110832	Speed of sound
DCM	110833	Ultrasound Attenuation
DCM	113068	Student's T-test

Coding Scheme Designator	Code Value	Code Meaning
DCM	113071	Z-score ~~**Map**~~
DCM	113057	R-Coefficient ~~**Map**~~
DCM	**dd1390_01**	**R2-Coefficient**
DCM	110834	RGB R Component
DCM	110835	RGB G Component
DCM	110836	RGB B Component
DCM	110837	YBR FULL Y Component
DCM	110838	YBR FULL CB Component
DCM	110839	YBR FULL CR Component
DCM	110840	YBR PARTIAL Y Component
DCM	110841	YBR PARTIAL CB Component
DCM	110842	YBR PARTIAL CR Component
DCM	110843	YBR ICT Y Component
DCM	110844	YBR ICT CB Component
DCM	110845	YBR ICT CR Component
DCM	110846	YBR RCT Y Component
DCM	110847	YBR RCT CB Component
DCM	110848	YBR RCT CR Component
DCM	110849	Echogenicity
DCM	110850	X-Ray Attenuation
DCM	110851	X-Ray Attenuation Coefficient
DCM	110852	MR signal intensity
DCM	110853	Binary Segmentation
DCM	110854	Fractional Probabilistic Segmentation
DCM	110855	Fractional Occupancy Segmentation

Amend DICOM PS3.16 - Content Mapping Resource - Controlled Terminology Definitions to make suitable for use both as Abstract Multi-dimensional Image Model Component Semantics and Quantity Descriptor:

Table D-1. DICOM Controlled Terminology Definitions

Code Value	Code Meaning	Definition	Notes
...	...	...	...
112031	Attenuation Coefficient	A quantitative numerical statement of the relative attenuation of the X-Ray beam at a specified point. Usually expressed in Hounsfield units [referred to as CT Number in Fraser and Pare].	
...	...	...	...
113041	Apparent Diffusion Coefficient	~~**The image is**~~**Values are** derived by calculation of the apparent diffusion coefficient.	
113042	Pixel by pixel addition	~~**The image is**~~**Values are** derived by the pixel by pixel addition of two images.	
113043	Diffusion weighted	~~**The image is**~~**Values are** derived by calculation of the diffusion weighting.	
113044	Diffusion Anisotropy	~~**The image is**~~**Values are** derived by calculation of the diffusion anisotropy.	

Code Value	Code Meaning	Definition	Notes
113045	Diffusion Attenuated	~~**The image is**~~**Values are** derived by calculation of the diffusion attenuation.	
113046	Pixel by pixel division	~~**The image is**~~**Values are** derived by the pixel by pixel division of two images.	
113047	Pixel by pixel mask	~~**The image is**~~**Values are** derived by the pixel by pixel masking of one image by another.	
113048	Pixel by pixel Maximum	~~**The image is**~~**Values are** derived by calculating the pixel by pixel maximum of two or more images.	
113049	Pixel by pixel mean	~~**The image is**~~**Values are** derived by calculating the pixel by pixel mean of two or more images.	
113050	Metabolite Maps from spectroscopy data	~~**The image is**~~**Values are** derived by calculating from spectroscopy data pixel values localized in two dimensional space based on the concentration of specific metabolites (i.e, at specific frequencies).	
113051	Pixel by pixel Minimum	~~**The image is**~~**Values are** derived by calculating the pixel by pixel minimum of two or more images.	
113052	Mean Transit Time	~~**The image is**~~**Values are** derived by calculating mean transit time values.	
113053	Pixel by pixel multiplication	~~**The image is**~~**Values are** derived by the pixel by pixel multiplication of two images.	
113054	Negative Enhancement Integral	~~**The image is**~~**Values are** derived by calculating negative enhancement integral values.	
113055	Regional Cerebral Blood Flow	~~**The image is**~~**Values are** derived by calculating regional cerebral blood flow values.	
113056	Regional Cerebral Blood Volume	~~**The image is**~~**Values are** derived by calculating regional cerebral blood volume values.	
113057	R-Coefficient Map	~~**The image is derived by calculating R-**~~**Correlation** Coefficient~~**, r map values**~~.	
113058	Proton Density~~ **map**~~	~~**The image is**~~**Values are** derived by calculating proton density values.	
113059	Signal Change~~ **Map**~~	~~**The image is**~~**Values are** derived by calculating signal change values.	
113060	Signal to Noise~~ **Map**~~	~~**The image is**~~**Values are** derived by calculating the signal to noise ratio.	
113061	Standard Deviation	~~**The image is**~~**Values are** derived by calculating the standard deviation of two or more images.	
113062	Pixel by pixel subtraction	~~**The image is**~~**Values are** derived by the pixel by pixel subtraction of two images.	
113063	T1~~ **Map**~~	~~**The image is**~~**Values are** derived by calculating T1 values.	
113064	T2*~~ **Map**~~	~~**The image is**~~**Values are** derived by calculating T2* values.	
113065	T2~~ **Map**~~	~~**The image is**~~**Values are** derived by calculating T2 values.	
113066	Time Course of Signal	~~**The image is**~~**Values are** derived by calculating values based on the time course of signal.	
113067	Temperature encoded	~~**The image is**~~**Values are** derived by calculating values based on temperature encoding.	
113068	Student's T-Test	~~**The image is**~~**Values are** derived by calculating the value of the Student's T-Test statistic from multiple image samples.	
113069	Time To Peak~~ **map**~~	~~**The image is**~~**Values are** derived by calculating values based on the time to peak.	
113070	Velocity encoded	~~**The image is**~~**Values are** derived by calculating values based on velocity encoded. E.g., phase contrast.	

Code Value	Code Meaning	Definition	Notes
113071	Z-Score ~~**Map**~~	~~**The image is**~~**Values are** derived by calculating the value of the Z-Score statistic from multiple image samples.	
113072	Multiplanar reformatting	~~**The image is**~~**Values are** derived by reformatting in a flat plane other than that originally acquired.	
113073	Curved multiplanar reformatting	~~**The image is**~~**Values are** derived by reformatting in a curve plane other than that originally acquired.	
113074	Volume rendering	~~**The image is**~~**Values are** derived by volume rendering of acquired data.	
113075	Surface rendering	~~**The image is**~~**Values are** derived by surface rendering of acquired data.	
113076	Segmentation	~~**The image is**~~**Values are** derived by segmentation (classification into tissue types) of acquired data.	
113077	Volume editing	~~**The image is**~~**Values are** derived by selectively editing acquired data (removing values from the volume), such as in order to remove obscuring structures or noise.	
113078	Maximum intensity projection	~~**The image is**~~**Values are** derived by maximum intensity projection of acquired data.	
113079	Minimum intensity projection	~~**The image is**~~**Values are** derived by minimum intensity projection of acquired data.	
113080	Glutamate and glutamine	For single-proton MR spectroscopy, the resonance peak corresponding to glutamate and glutamine.	
113081	Choline/Creatine Ratio	For single-proton MR spectroscopy, the ratio between the Choline and Creatine resonance peaks.	
113082	N-acetylaspartate /Creatine Ratio	For single-proton MR spectroscopy, the ratio between the N-acetylaspartate and Creatine resonance peaks.	
113083	N-acetylaspartate /Choline Ratio	For single-proton MR spectroscopy, the ratio between the N-acetylaspartate and Choline resonance peaks.	
113085	Spatial resampling	~~**The image is**~~**Values are** derived by spatial resampling of acquired data.	
113086	Edge enhancement	~~**The image is**~~**Values are** derived by edge enhancement.	
113087	Smoothing	~~**The image is**~~**Values are** derived by smoothing.	
113088	Gaussian blur	~~**The image is**~~**Values are** derived by Gaussian blurring.	
113089	Unsharp mask	~~**The image is**~~**Values are** derived by unsharp masking.	
113090	Image stitching	~~**The image is**~~**Values are** derived by stitching two or more images together.	
113091	Spatially-related frames extracted from the volume	Spatially-related frames in this image are representative frames from the referenced 3D volume data set.	
113092	Temporally-related frames extracted from the set of volumes	Temporally-related frames in this image are representative frames from the referenced 3D volume data set.	
113093	Polar to Rectangular Scan Conversion	Conversion of a polar coordinate image to rectangular (Cartesian) coordinate image.	
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.	

Code Value	Code Meaning	Definition	Notes
113097	Multi-energy proportional weighting	Image pixels created through proportional weighting of multiple acquisitions at distinct X-Ray energies.	
...	...	...	...
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 sum 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.	

Code Value	Code Meaning	Definition	Notes
110838	YBR FULL CB Component	CB (Blue chrominance) component of a YBR FULL image, as defined in JPEG 2000.	
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.	
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.	
dd1390_01	**R2-Coefficient**	**Coefficient of determination, R^2. An indication of goodness of fit.**	