DICOM Correction Item

Correction Number	CP-351

Log Summary: Addition of stress/rest terminology to NM IODs	

Type of Modification	Name of Standard
Enhancement	PS 3.3 2003 and PS 3.16-2003

Rationale for Correction

Currently there is no way to convey coded information describing the conditions under which the Image was acquired. This information is important for identifying different segments of a cardiac imaging protocol (e.g. stress vs. rest) for example. The purpose of this CP is to add the capability to identify stress/rest in the NM IOD.

Note that there is no attempt to differentiate between cardiac stress induced pharmacologically and stress induced through exercise, as the method of achieving the stress condition does not affect the interpretation.

Two different mechanisms for encoding the stress/rest information have been considered. These are the Acquisition Context Module, and the Stage Code Sequence. At the suggestion of WG6 members, previous versions of this CP have proposed to use of the Stage Code Sequence. However, after further review, Working Group 3 has concluded that this does not fit the intended use in NM. Therefore, this CP has been amended to make use of the Acquisition Context Module. Some of the reasoning for this decision is as follows:

1) The Stage Code Sequence is intended for labeling the current patient state at the time the acquisition is being done. This is not what happens in NM. In NM the determination of stress and rest states is based on the physician's understanding of the state of the pharmaceutical, the type of pharmaceutical and the state of the patient at the time they were injected, as well as the patient state at time of imaging. In many cases the state of the pharmaceutical and the current state of the patient are quite different, with the 'stress' image being acquired while the patient is physically at rest (but the pharmaceutical state is 'stress' due to a previously induced stress of the patient). Therefore, the labeling of stress and rest is based on the entire context under which the image is acquired.

2) For myocardial perfusion imaging the stress and rest terms each apply to a single acquisition. They do not apply to stages of a single acquisition, as they would in US and XA procedures, where during a single "acquisition" the patients state changes are induced during different stages of a single acquisition.

For these reasons, WG3 feels that the Acquisition Context Module is a much better fit.

Likewise, further consideration was given to the level at which this labeling should be placed. In previous versions of this CP, the stress/rest labeling was added at the Series Level. For the sake of consistency with other IODs, and in consideration of existing implementations of the NM IOD, Working Group 3 has decided that the Acquisition Context Module should be placed at the Image level.

Sections of documents affected

PS 3.3 Sections A.5.4, and PS 3.16 Annex B, C and D

Correction Wording:

Add the following line to PS3.3 Table A.5-1,

**Table A.5-1
NM IMAGE IOD MODULES**

IE	Module	Reference	Usage
.....			
Image	Image Pixel	C.7.6.3	M
	Acquisition Context	**C.7.6.14**	**U**
	NM Image Pixel	C.8.4.7	M
....			

Add the following section to Part 3.3.

A.5.4.1 Acquisition Context Module

The Defined Template for Acquisition Context Sequence (0040,0555) is TID 3470.

The Acquisition Context Sequence (0040,0555) shall always apply to all frames in the Image. Patient State shall always apply to all frames in the Image, therefore, Referenced Frame Numbers (0040,A136) shall not be present.

Add the following Context ID Tables to PS3.16, Annex B.

CID 3101   NM PROCEDURAL STATE VALUES

**Context ID 3101
NM Procedural State Values
Type: Extensible   Version: 20040112**

Coding Scheme Designator (0008,0102)		Code Value (0008,0100)	Code Meaning (0008,0104)
SRT		F-01604	Resting State
DCM		109091	Cardiac Stress State
DCM		109092	Reinjection State
DCM		109093	Redistribution State
DCM		109094	Delayed Redistribution State

Add the following Template ID Tables to PS3.16, Annex C, Acquisition Context Templates

TID 3470   NM ACQUISITION CONTEXT

TID 3470
NM Acquisition Context

	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	CODE	(109055, DCM, "Patient State")	1	M		DCID (3101) NM Procedural State Values

Add the following Definitions to PS3.16, Annex D.

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

Code Value	Code Meaning	Definition
.....		
109091	Cardiac Stress State	Imaging after injection of tracer during increased cardiac workload or increased myocardial blood flow, achieved by either exercise or pharmacologic means.
109092	Reinjection State	Imaging after injection of additional tracer under resting conditions.
109093	Redistribution State	Imaging after allowing a moderate amount of time for tracer to move from its initial sites of uptake. Example: For Thallium imaging this would correspond to imaging 2-6 hours after injection.
109094	Delayed Redistribution State	Imaging after allowing an extended amount of time for tracer to move from its initial sites of uptake. Example: For Thallium imaging this would correspond to imaging more than 6 hours after injection.
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