

## DICOM Correction Proposal

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Date of Last Update	2013/01/29
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Correction Number	CP-1229
Log Summary: Add glucose to PET acquisition context	
Name of Standard PS 3.3, 3.16 2011	
<p>Rationale for Correction:</p> <p>For FDG PET, the patient's blood glucose is an important parameter that is measure before the examination is performed and is taken into account by the radiologist during interpretation. It is often measured in the imaging suite and is not necessarily available via other mechanisms (such as in the HIS or EMR, especially in an ambulatory facility). The Quantitative Imaging Biomarker Alliance (QIBA) FDG PET group has emphasized the importance of this parameter.</p> <p>Accordingly, a standard mechanism for recording it should be defined in the DICOM image header, such that an Acquisition Modality or a post-processing device has a place to record it.</p> <p>The Acquisition Context Module already defines a place where such information can be recorded in a coded and structured manner, and given that (classic) PET and NM IODs already defined a template for the use of this Module, the template is extended beyond cardiovascular stress/rest state to included additional covariates. It is also added to the enhanced PET IOD.</p> <p>It is also possible that the glucose information may be available from another system that is accessible to the RIS, and hence it can be provided via the Modality Worklist. Accordingly, additional numeric parameters are defined in a template for the worklist, and reference is made to this possible source in the image IODs.</p> <p>Note that the SI unit (mmol/l) for blood glucose is required, not the mass (rather than molar) unit that is common in the US; a standard conversion factor can be applied if a different unit is preferred for display (1 mmol/l = 18.0182 mg/dl). This is partly a consequence of the fact that these are interchangeable, and partly because the LOINC codes are specific to the units.</p> <p>An open question is whether or not more specific information should be included about the type of glucose measurement (source of blood, type of assay, etc.), or the fact that it was nominally fasting rather than "random", etc., but this is probably overkill for the use case (and more for the operator to enter).</p>	
Correction Wording:	

*Amend PS 3.3 IOD references to the Acquisition Context templates:*

### A.5 NUCLEAR MEDICINE IMAGE INFORMATION OBJECT DEFINITION

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#### A.5.4.1 Acquisition Context Module

The Defined Template for Acquisition Context Sequence (0040,0555) is TID 3470, **which includes description of the cardiovascular rest or stress state.**

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.

The Acquisition Context information may be entered during acquisition, or obtained from the Modality Worklist using information supplied in the Protocol Context, using TID 15101 NM/PET Protocol Context.

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**A.21 POSITRON EMISSION TOMOGRAPHY IMAGE INFORMATION OBJECT DEFINITION**

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**A.21.3.1 Acquisition Context Module**

The Defined Template for Acquisition Context Sequence (0040,0555) is TID 3470, which includes description of the cardiovascular rest or stress state, and the blood glucose measurement.

The Acquisition Context information may be entered during acquisition, or obtained from the Modality Worklist using information supplied in the Protocol Context, using TID 15101 NM/PET Protocol Context.

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**A.56 ENHANCED POSITRON EMISSION TOMOGRAPHY IMAGE INFORMATION OBJECT DEFINITION**

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**A.56.1.5 Acquisition Context Module**

The Defined Template for Acquisition Context Sequence (0040,0555) is TID 34x1, which includes the blood glucose measurement. In contrast to the PET Image IOD, the description of the cardiovascular rest or stress state is encoded in the Enhanced PET Image IOD using the Patient Physiological State Functional Group Macro, rather than the Acquisition Context.

The Acquisition Context information may be entered during acquisition, or obtained from the Modality Worklist using information supplied in the Protocol Context, using TID 15101 NM/PET Protocol Context.

*Amend PS 3.16 existing Acquisition Context templates:*

**TID 3470 NM/PET Acquisition Context**

TID 3470  
**NM/PET Acquisition Context**  
 Type: Extensible Order: Non-Significant

	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	CODE	(109054, DCM, "Patient State")	1	M		DCID (3101) Cardiac Procedural State Values
2	INCLUDE	TID 3471 PET Covariates Acquisition Context	1	U		

*Add PS 3.16 new Acquisition Context template:*

**TID 34x1 PET Covariates Acquisition Context**

TID 3471  
**PET Covariates Acquisition Context**  
 Type: Extensible Order: Non-Significant

	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	NUMERIC	(14749-6, LN, "Glucose")	1	U		UNITS = EV("mmol/l", UCUM, "mmol/l")
2	DATE	(109081,DCM, "Glucose Measurement Date")	1	MC	IFF Row 1 is present	
3	TIME	(109082,DCM, "Glucose Measurement Time")	1	MC	IFF Row 1 is present	

Amend PS 3.16 existing Worklist (protocol context) template to add glucose:

**TID 15101 NM/PET Protocol Context**

**TID 15101  
NM/PET Protocol Context  
Type: Extensible Order: Significant**

	NL	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		CODE	EV (123001, DCM, "Radiopharmaceutical")	1	M		BCID 25 (NM) or 4021 (PET)
2	>	CODE	EV (C-B1000, SRT, "Diagnostic Radioisotope")	1	U		BCID 18 (NM) or 4020 (PET)
3	>	DATETIME	EV (123003, DCM, "Radiopharmaceutical Start Time")	1	U		
4	>	DATETIME	EV (123004, DCM, "Radiopharmaceutical Stop Time")	1	U		
5	>	NUMERIC	EV (123005, DCM, "Radiopharmaceutical Volume")	1	U		Units = DT(cm3, UCUM, "cm3")
6	>	NUMERIC	EV (123006, DCM, "Radionuclide Total Dose")	1	U		Units = DT(Bq, UCUM, "Bq")
7	>	NUMERIC	EV (123007, DCM, "Radiopharmaceutical Specific Activity")	1	U		Units = DT(Bq/mol, UCUM, "Bq/mol")
8	>	CODE	EV (G-C340, SRT, "Route of Administration")	1	U		BCID 11
9	>	NUMERIC	EV (123009, DCM, "Radionuclide Syringe Counts")	1	U		Units = DT({counts}/s, UCUM "counts/s")
10	>	NUMERIC	EV (123010, DCM, "Radionuclide Residual Syringe Counts")	1	U		Units = DT({counts}/s, UCUM "counts/s")
11		<u>NUMERIC</u>	<u>(14749-6, LN, "Glucose")</u>	<u>1</u>	<u>U</u>		<u>UNITS = EV("mmol/l", UCUM, "mmol/l")</u>
12	>	<u>DATE</u>	<u>(109081,DCM, "Glucose Measurement Date")</u>	<u>1</u>	<u>M</u>		
13	>	<u>TIME</u>	<u>(109082,DCM, "Glucose Measurement Time")</u>	<u>1</u>	<u>M</u>		

Amend PS 3.16 Annex D definitions to add new concepts:

109081	Glucose Measurement Date	The date that a glucose measurement was performed	
109082	Glucose Measurement Time	The time that a glucose measurement was performed	