

DICOM Correction Proposal Form

Tracking Information - Administration Use Only	
Correction Proposal Number	CP-596
STATUS	Assigned
Date of Last Update	2005-05-19
Person Assigned	R Horn
Submitter Name	IHE Radiology Technical Committee
Submission date	2005-June-16

Correction Number	CP-596
Log Summary: Add request and scheduled information to results and MPPS.	
Type of Modification	Name of Standard
MODIFICATION	PS 3.3, 3.4, 3.16 2004

Rationale for Correction

During the development of its Technical Framework, IHE Radiology has identified data elements in image and MPPS instances that are necessary for propagating scheduled information from one system to subsequent systems in a workflow chain. IHE aims at closing the workflow loop for its group case and Presentation of Grouped Procedures case in the Scheduled Workflow.

The underlying data model defines the critical identifiers that need to be kept consistent in order to relate different instances over the workflow performed by RIS, PACS, workstation, and modality

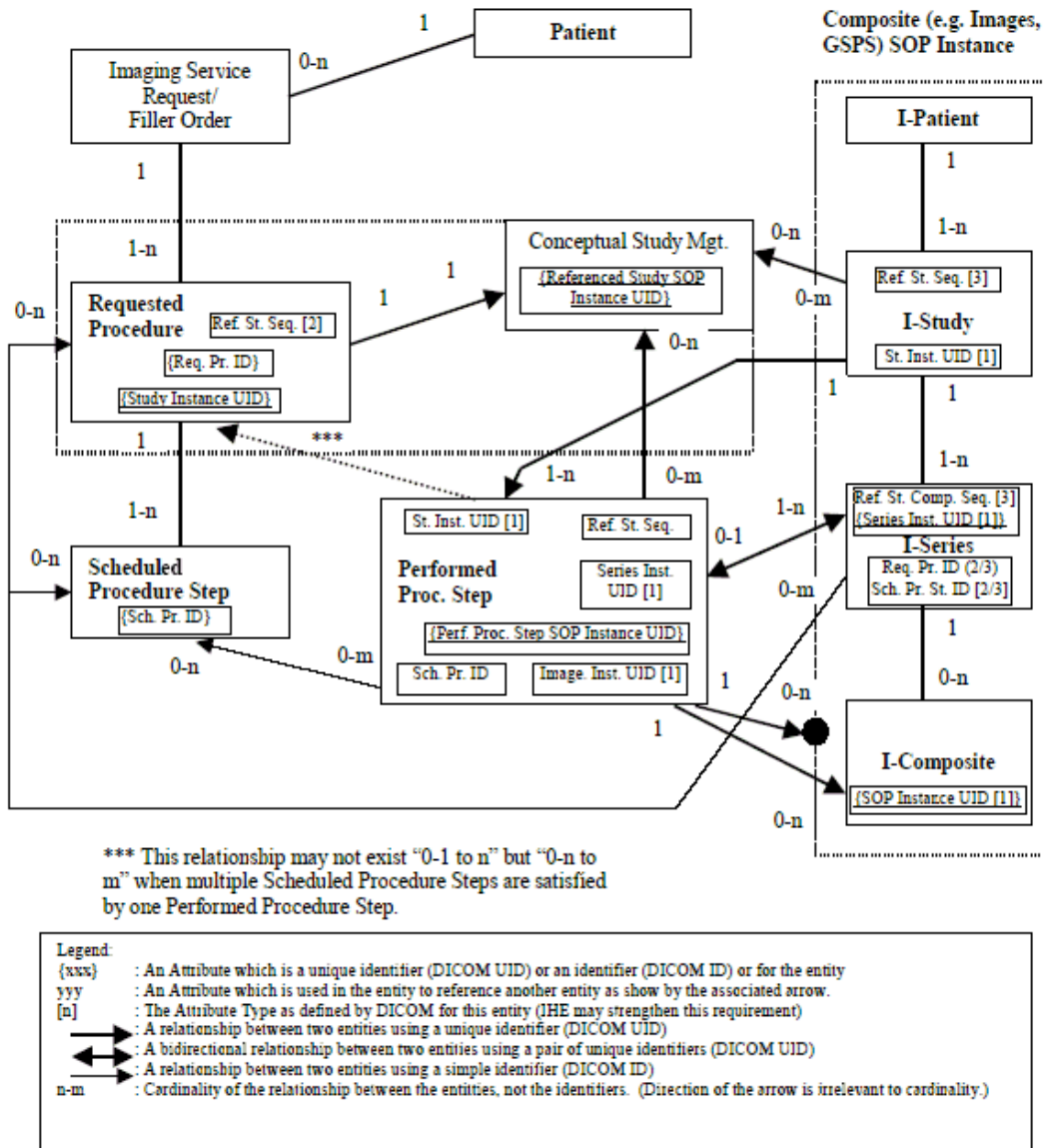


Figure A-1. Data Consistency Model: Modality Worklist Information Model, Composite IODs and Modality Performed Procedure Step IOD

(IHE Radiology TF-2, A.4).

Values from acquired image instances can serve to fill in values in subsequently generated instances related to this acquisition. This is especially true while grouping or referencing instances for presentation on a workstation that can only use the acquired images to obtain such workflow information.

Per DICOM definition, the Request Attributes Sequence (0040,0275) in images is designed to contain attributes from the Imaging Service Request. A system generating instances including this sequence can therefore use this sequence to copy a subset of the scheduled information that led to the creation of these instances. It is proposed to complete the Request Attributes Sequence (0040,0275) by adding the following elements as Type 3 data elements:

- **Referenced Study Sequence (0008,1110):** This element is needed to append instances to a Group Case from a Modality, i.e. information from the acquired and grouped images can be re-used for subsequently processed instances. This is especially true if the Group Case resulted from grouping several SPSs belonging to different Requested Procedure, e.g. 3 SPS belonging to 2 different Requested Procedure. The Request Attributes Sequence data from previous images is a prerequisite for reliably filling the Referenced Study Sequence in the appended PPS (otherwise: ambiguity of relation between SPS and Requested Procedure).
- **Accession Number (0008,0050):** This element is useful to append instances to a Modality Group Case (i.e. information from the acquired and grouped images can be re-used for subsequently processed instances). This is especially true if the Group Case grouped several SPSs belonging to different Imaging Service Request (e.g. 2 SPS belonging to 2 different Imaging Service Request). The Accession Number in the Request Attributes Sequence of previously grouped images is a prerequisite to fill the Accession Number in the Append PPS.
- **Requested Procedure Code Sequence (0032,1064):** This element is needed to group instances for presentation/ viewing (IHE “Presentation of Grouped Procedures” (PGP) profile), or to append instances to one of the Requested Procedures of a Group Case. For PGP, if the Modality is acquiring what was scheduled, it will send in the images a Procedure Code Sequence including as many items as there are different Requested Procedure Codes. IHE requires the modality to provide in the GSPS and in the associated PPS (for PGP) only the Procedure Code of the referenced Requested Procedure.
- **Requested Procedure Description (0032,1060):** This element is needed to be able to fill the Requested Procedure Description attribute in the PPS instance when performing an Append PPS on a workstation.
- **Study Instance UID (0020,000D):** This element is received from the Order Filler through Modality Worklist. It facilitates the mapping performed by Modalities when appending instances to one of the Requested Procedures of a Group Case.

Similarly for MPPS, those RIS or PACS that completely exploit MPPS values can benefit from using coded values from the Requested Procedure Code Sequence for group or PGP cases. It is proposed to optionally add the attribute Requested Procedure Code Sequence (0032,1064) to the Scheduled Step Attribute Sequence (0040,0270) in MPPS, as Type 3 attribute.

The IHE Profile Presentation of Grouped Procedures defines a selection activity that creates one or more instance subsets from a grouped acquisition for viewing. This results in one or more Presentation States (GSPS) and PPSs completing this selection/ splitting step. The “protocol” used in performing the PPS means “selecting/ splitting images for presentation”. Like for any other PPS, an appropriate value for the Performed Protocol Code Sequence should exist for exactly describing what was performed in order to enable unambiguous understanding of the performed activity. It is suggested that such a code be registered by DICOM in Part 16 (meaning: “selecting/ splitting images for presentation”).

Sections of documents affected

PS 3.3, 3.4, 3.16

Correction Wording:

Modify table C.4.13 in PS3.3 as follows:

**Table C.4-13
PERFORMED PROCEDURE STEP RELATIONSHIP MODULE ATTRIBUTES**

Attribute Name	Tag	Attribute Description
Patient's Name	(0010,0010)	Patient's full legal name.
Patient ID	(0010,0020)	Primary hospital identification number or code for the patient.
Issuer of Patient ID	(0010,0021)	Identifier of the Assigning Authority that issued the Patient ID.
Patient's Birth Date	(0010,0030)	Date of birth of the named patient
Patient's Sex	(0010,0040)	Sex of the named Patient. Enumerated Values: M = male F = female O = other
Referenced Patient Sequence	(0008,1120)	Uniquely identifies the Patient SOP Instance.
>Referenced SOP Class UID	(0008,1150)	Uniquely identifies the referenced SOP Class.
>Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the referenced SOP Instance.
Scheduled Step Attributes Sequence	(0040,0270)	Sequence containing attributes that are related to the scheduling of the Procedure Step. The Sequence may have one or more Items.
>Study Instance UID	(0020,000D)	Unique identifier for the Study.
>Referenced Study Sequence	(0008,1110)	Uniquely identifies the Study SOP Instance associated with this Scheduled Procedure Step. This Sequence shall have only one Item.
>>Referenced SOP Class UID	(0008,1150)	Uniquely identifies the SOP Class.
>>Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the SOP Instance.
>Accession Number	(0008,0050)	A departmental IS generated number that identifies the order for the Study.
>Placer Order Number/Imaging Service Request	(0040,2016)	The order number assigned to the Imaging Service Request by the party placing the order.
>Filler Order Number/Imaging Service Request	(0040,2017)	The order number assigned to the Imaging Service Request by the party filling the order.
>Requested Procedure ID	(0040,1001)	Identifier of the related Requested Procedure.
>Requested Procedure Description	(0032,1060)	Institution-generated administrative description or classification of Requested Procedure.
>Requested Procedure Code Sequence	(0032,1064)	A sequence that conveys the Procedure Type of the requested procedure. The Requested Procedure Code Sequence shall contain only a single item.
>>Include 'Code Sequence Macro' Table 8.8-1		<u>No Baseline Context ID is defined.</u>

>Scheduled Procedure Step ID	(0040,0009)	Identifier of the related Scheduled Procedure Step.
>Scheduled Procedure Step Description	(0040,0007)	Institution-generated description or classification of the Scheduled Procedure Step to be performed.
>Scheduled Protocol Code Sequence	(0040,0008)	Sequence describing the Scheduled Protocol following a specific coding scheme. This sequence contains one or more Items.
>>Include 'Code Sequence Macro' Table 8.8-1		No Baseline Context ID is defined.
>>Protocol Context Sequence	(0040,0440)	Sequence that specifies the context for the Scheduled Protocol Code Sequence Item. One or more items may be included in this sequence. See Section C.4.10.1.
>>>Include 'Content Item Macro' Table 10-2		No Baseline Template is defined.
>>> Content Item Modifier Sequence	(0040,0441)	Sequence that specifies modifiers for a Protocol Context Content Item. One or more items may be included in this sequence. See Section C.4.10.1.
>>>>Include 'Content Item Macro' Table 10-2		No Baseline Template is defined.

Modify table C.7-5a in PS3.3 as follows:

**Table C.7-5a
GENERAL SERIES MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Type of equipment that originally acquired the data used to create the images in this Series. See C.7.3.1.1.1 for Defined Terms.
Series Instance UID	(0020,000E)	1	Unique identifier of the Series.
...
Largest Pixel Value in Series	(0028,0109)	3	The maximum value of all images in this Series.
Request Attributes Sequence	(0040,0275)	3	Sequence that contains attributes from the Imaging Service Requests. The sequence may have one or more Items.
>Requested Procedure ID	(0040,1001)	1C	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if Sequence Item is present.
>Accession Number	(0008,0050)	3	The Accession Number provided by the Imaging Service Request for this Requested Procedure.
>Study Instance UID	(0020,000D)	3	The unique identifier for the Study provided for this Requested Procedure.
>Referenced Study Sequence	(0008,1110)	3	A sequence that provides reference to a Study SOP Class/Instance pair. One or more items may be included.

>>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the referenced SOP Class. Required if Referenced Study Sequence (0008,1110) is sent.
>>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance. Required if Referenced Study Sequence (0008,1110) is sent.
>Requested Procedure Description	(0032,1060)	3	Institution-generated administrative description or classification of Requested Procedure.
>Requested Procedure Code Sequence	(0032,1064)	3	A sequence that conveys the Procedure Type of the requested procedure. The Requested Procedure Code Sequence shall contain only a single item.
>>Include 'Code Sequence Macro' Table 8.8-1		No Baseline Context ID is defined.	
>Reason for the Requested Procedure	(0040,1002)	3	Reason for requesting this procedure.
>Reason for Requested Procedure Code Sequence	(0040,100A)	3	Coded Reason for requesting this procedure.
>>Include 'Code Sequence Macro' Table 8.8-1		No Baseline Context ID is defined.	
...

Modify table C.8-37 in PS3.3 as follows:

Table C.8-37 - RT SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Type of equipment that originally acquired the data. Enumerated Values: RTIMAGE = RT Image RTDOSE = RT Dose RTSTRUCT = RT Structure Set RTPLAN = RT Plan RTRECORD = RT Treatment Record See C.8.8.1.1.
Series Instance UID	(0020,000E)	1	Unique identifier of the series.
...
Request Attributes Sequence	(0040,0275)	3	Sequence that contains attributes from the Imaging Service Requests. The sequence may have one or more Items.
>Requested Procedure ID	(0040,1001)	1C	Identifier which identifies the Requested Procedure in the Imaging Service Request. Required if Sequence Item is present.
>Scheduled Procedure Step ID	(0040,0009)	1C	Identifier which identifies the Scheduled

			Procedure Step. Required if Sequence Item is present.
>Accession Number	(0008,0050)	3	The Accession Number provided by the Imaging Service Request for this Requested Procedure.
>Study Instance UID	(0020,000D)	3	The unique identifier for the Study provided for this Requested Procedure.
>Referenced Study Sequence	(0008,1110)	3	A sequence that provides reference to a Study SOP Class/Instance pair. One or more items may be included.
>>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the referenced SOP Class. Required if Referenced Study Sequence (0008,1110) is sent.
>>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance. Required if Referenced Study Sequence (0008,1110) is sent.
>Requested Procedure Description	(0032,1060)	3	Institution-generated administrative description or classification of Requested Procedure.
>Requested Procedure Code Sequence	(0032,1064)	3	A sequence that conveys the Procedure Type of the requested procedure. The Requested Procedure Code Sequence shall contain only a single item.
>>Include 'Code Sequence Macro' Table 8.8-1		No Baseline Context ID is defined.	
>Scheduled Procedure Step Description	(0040,0007)	3	Institution-generated description or classification of the Scheduled Procedure Step to be performed.
>Scheduled Protocol Code Sequence	(0040,0008)	3	Sequence describing the Scheduled Protocol following a specific coding scheme. This sequence contains one or more Items.
>>Include 'Code Sequence Macro' Table 8.8-1		No Baseline Context ID is defined.	
>>Protocol Context Sequence	(0040,0440)	3	Sequence that specifies the context for the Scheduled Protocol Code Sequence Item. One or more items may be included in this sequence.
>>>Include 'Content Item Macro' Table 10-2		No Baseline Template is defined.	
>>> Content Item Modifier Sequence	(0040,0441)	3	Sequence that specifies modifiers for a Protocol Context Content Item. One or more items may be included in this sequence. See Section C.4.10.1.
>>>>Include 'Content Item Macro' Table 10-2		No Baseline Template is defined.	
...

Modify table F.7.2-1 in PS3.4 as follows:

**Table F.7.2-1
MODALITY PERFORMED PROCEDURE STEP SOP CLASS N-CREATE, N-SET AND FINAL
STATE ATTRIBUTES**

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Requirement Type Final State (See Note 1)
Specific Character Set	(0008,0005)	1C/1C (Required if an extended or replacement character set is used)	Not allowed	
Performed Procedure Step Relationship				
Scheduled Step Attribute Sequence	(0040,0270)	1/1	Not allowed	
>Study Instance UID	(0020,000D)	1/1	Not allowed	
>Referenced Study Sequence	(0008,1110)	2/2	Not allowed	
>>Referenced SOP Class UID	(0008,1150)	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Referenced SOP Instance UID	(0008,1155)	1C/1 (Required if Sequence Item is present)	Not allowed	
>Accession Number	(0008,0050)	2/2	Not allowed	
>Placer Order Number/Imaging Service Request	(0040,2016)	3/3	Not allowed	
>Filler Order Number/Imaging Service Request	(0040,2017)	3/3	Not allowed	
>Requested Procedure ID	(0040,1001)	2/2	Not allowed	
>Requested Procedure Code Sequence	(0032,1064)	3/3	Not allowed	
>Requested Procedure Description	(0032,1060)	2/2	Not allowed	
>Scheduled Procedure Step ID	(0040,0009)	2/2	Not allowed	

>Scheduled Procedure Step Description	(0040,0007)	2/2	Not allowed	
>Scheduled Protocol Code Sequence	(0040,0008)	2/2	Not allowed	
>>Code Value	(0008,0100)	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme designator	(0008,0102)	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme Version	(0008,0103)	3/3	Not allowed	
>>Code Meaning	(0008,0104)	3/3	Not allowed	
>>All other Attributes from Scheduled Protocol Code Sequence		3/3	Not allowed	
...

Modify table F.8.2-1 in PS3.4 as follows:

**Table F.8.2-1
MODALITY PERFORMED PROCEDURE STEP RETRIEVE SOP CLASS N-GET ATTRIBUTES**

Attribute Name	Tag	Requirement Type (SCU/SCP)
Specific Character Set	(0008,0005)	3/1C (Required if an extended or replacement character set is used)
Performed Procedure Step Relationship		
Scheduled Step Attributes Sequence	(0040,0270)	3/1
>Study Instance UID	(0020,000D)	-/1
>Referenced Study Sequence	(0008,1110)	-/2
>>Referenced SOP Class UID	(0008,1150)	-/1C (Required if Sequence Item is present)
>>Referenced SOP Instance UID	(0008,1155)	-/1C (Required if Sequence Item is present)
>Accession Number	(0008,0050)	-/2
>Placer Order Number/Imaging	(0040,2016)	-/3

Service Request		
>Filler Order Number/Imaging Service Request	(0040,2017)	-/3
>Requested Procedure Code Sequence	(0032,1064)	-/3
>Requested Procedure Description	(0032,1060)	-/2
>Requested Procedure ID	(0040,1001)	-/2
>Scheduled Procedure Step ID	(0040,0009)	-/2
>Scheduled Procedure Step Description	(0040,0007)	-/2
>Scheduled Protocol Code Sequence	(0040,0008)	-/2
>>Code Value	(0008,0100)	-/1C (Required if Sequence Item is present)
>>Coding Scheme designator	(0008,0102)	-/1C (Required if Sequence Item is present)
>>Coding Scheme Version	(0008,0103)	-/3
>>Code Meaning	(0008,0104)	-/3
>>All other Attributes from Scheduled Protocol Code Sequence		-/3
...

Modify table C.4-15 in PS 3.3 as follows:

**Table C.4-15
IMAGE ACQUISITION RESULTS MODULE ATTRIBUTES**

Attribute Name	Tag	Attribute Description
Modality	(0008,0060)	Type of equipment that originally acquired the data used to create the images associated with this Modality Performed Procedure Step. See C.7.3.1.1.1 for Defined Terms. Note: A Modality value in the created SOP Instances may be different from the MPPS Modality value. For example, multiple series may have been created during the MPPS (images, waveforms, softcopy presentation states and/or structured reports) with SOP Instances in different series having different modality values.
Study ID	(0020,0010)	User or equipment generated Study Identifier.
Performed Protocol Code Sequence	(0040,0260)	Sequence describing the Protocol performed for this Procedure Step. This sequence may have zero or more Items.
>Include 'Code Sequence Macro' Table 8.8-1		No Baseline Context ID is defined. Baseline Context ID is XYZ
>Protocol Context Sequence	(0040,0440)	Sequence that specifies the context for the Performed Protocol Code Sequence Item. One or more items may be included in this sequence. See Section C.4.10.1.
>>Include 'Content Item Macro' Table 10-2		No Baseline Template is defined.
...

Add in Annex B in PS 3.16 the following Context ID

CID XYZ Performed Procedure Step Code

Context ID XYZ

Performed Procedure Step Code

Type: Extensible Version: 20050519

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	Zzz	Selecting or splitting images for presentation

Add the following term to Part 16 Annex D:

DICOM Code Definitions (Coding Scheme Designator “DCM” Coding Scheme Version “01”)

Code Value	Code Meaning	Definition	Notes
...			
<u>Zzz</u>	<u>Selecting or splitting images for presentation</u>	<u>Selecting instances from a larger set of instances for specific viewing purposes, and creating a PPS describing this activity.</u>	<u>Used by the IHE Radiology Integration Profile “Presentation for Grouped Procedures”, where one or more Presentation State instances allow instance subsets from a study to be viewed separately.</u>