

## DICOM Correction Proposal Form

| Tracking Information - Administration Use Only |  |
|--|--|
| Correction Proposal Number                     | CP-257   |
| STATUS   | Assigned   |
| Date of Last Update                            | 2000/09/04   |
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|  |                  |
|--|------------------|
| Correction Number  | CP-257           |
| Log Summary: Clarify Referenced Study Component Sequence   |                  |
| Type of Modification   | Name of Standard |
| Clarification  | PS 3.3 2000      |
| <p><b>Rationale for Correction</b></p> <p>The use of Referenced Study Component Sequence (0008,1111) has evolved since the first DICOM publication in 1993. Both novice and more experienced readers of DICOM frequently misinterpret this attribute since it is not consistently described. The use of Performed Procedure Steps and have effectively replaced Study Components within the current DICOM model.</p> <p>Supplement 17 (Modality Performed Procedure Step) introduced the concept of a Performed Procedure Step as a generalization of Study Component. Text was added to Part 4, Annex F to allow a Referenced Study Component Sequence (0008,1111) to reference either a Study Component SOP Instance or an MPPS SOP Instance. While the attribute description in the General Series Module was updated to reflect this duality, other attribute descriptions have not all been similarly updated.</p> <p>Supplement 52 (General-Purpose Worklist) introduced a General-Purpose Performed Procedure Step but did not clarify if Referenced Study Component Sequence (0008,1111) can also reference a General-Purpose Performed Procedure Step SOP Instance.</p> <p>The proposed solution is to avoid confusion and rename the attribute from "Referenced Study Component Sequence" to "Referenced Performed Procedure Step Sequence" and adapt all descriptions and references.</p> <p>This CP originally included changes to Referenced Study Component Sequence (0008,1111) within the Storage Commitment Service Class. However, Supplement 68 (Retire Storage Commitment Pull Model) retires the use of Referenced Study Component Sequence (0008,1111) within Storage Commitment and the changes have therefore been removed from this CP.</p> |                  |

Sections of documents affected

PS 3.3 C.4.1, Table C.4-1

PS 3.3 C.7.3.1, Table C.7-4

PS 3.3 C.8.8.1, Table C.8-33

PS 3.3 C.8.11.1, Table C.8-64

PS 3.3 C.17.1, Table C.17-1

PS 3.3 Annex K

PS 3.4 F.1.1

PS 3.4 F.3.2.1.1

PS 3.4 F.3.5.1

PS 3.3, C.4.19 (from Supplement 52)

PS 3.3, K.6.2.2.2 (from Supplement 52)

PS 3.6, Section 6

Correction Wording:

Item 1: Amend PS3.3, C.4.1 Study Relationship Module

**Table C.4-1  
STUDY RELATIONSHIP MODULE ATTRIBUTES**

| Attribute Name   | Tag         | Attribute Description   |
|--|-------------|---|
| ...  | ...         | ...   |
| <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | <del>Uniquely identifies the Study Component SOP Instance to which the Study SOP Instance is related.</del> <b>Uniquely identifies the Performed Procedure Step SOP Instance to which the Study SOP Instance is related (e.g. a Modality or General-Purpose Performed Procedure Step SOP Instance or Study Component SOP Instance).</b> |
| >Referenced SOP Class UID  | (0008,1150) | Uniquely identifies the referenced SOP Class.   |
| >Referenced SOP Instance UID   | (0008,1155) | Uniquely identifies the referenced SOP Instance.  |
| ...  | ...         | ...   |

Item 2: Amend PS3.3, C.7.3.1 General Series Module

**Table C.7-4  
GENERAL SERIES MODULE ATTRIBUTES**

| Attribute Name   | Tag         | Type | Attribute Description  |
|--|-------------|------|--|
| ...  |             |      |  |
| <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | 3    | <del>Uniquely identifies the Study Component SOP Instance or Modality Performed Procedure Step SOP Instance to which the Series is related.</del> <b>Uniquely identifies the Performed Procedure Step SOP Instance to which the Series is related (e.g. a Modality or General-Purpose Performed Procedure Step SOP Instance or Study Component SOP Instance).</b> The Sequence shall have zero or one Items. |
| >Referenced SOP Class UID  | (0008,1150) | 1C   | Uniquely identifies the referenced SOP Class. Required if <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.  |
| >Referenced SOP Instance UID   | (0008,1155) | 1C   | Uniquely identifies the referenced SOP Instance. Required if <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.   |
| ...  |             |      |  |

- Notes: 1. If the Modality **or General-Purpose** Performed Procedure Step SOP Class is supported as an SCU by a Storage SCU, the SCU is strongly encouraged to support the attribute ~~Referenced Study Component Sequence~~ **Referenced Performed Procedure Step Sequence** (0008,1111). This attribute references the ~~Modality~~ Performed Procedure Step SOP Instance, and extraction of this Attribute from an image may allow retrieval of the ~~Modality~~ Performed Procedure Step SOP Instance.
2. If the Modality does not conform to the Modality **or General-Purpose** Performed Procedure Step SOP Class, it is still advisable to include the attributes Performed Procedure Step Start Date (0040,0244), Performed Procedure Step Start Time (0040,0245) and Performed Procedure Step Description (0040,0254) into the Image IODs.

Item 3: Amend PS 3.3, C.8.8.1 RT Series Module

**Table C.8-33 - RT SERIES MODULE ATTRIBUTES**

| Attribute Name   | Tag         | Type | Attribute Description  |
|--|-------------|------|--|
| ...  |             |      |  |
| <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | 3    | <del>Uniquely identifies the Study Component SOP Instances to which the series is related.</del> <b>Uniquely identifies the Performed Procedure Step SOP Instance to which the Series is related (e.g. a Modality or General-Purpose Performed Procedure Step SOP Instance or Study Component SOP Instance).</b> One or more items may be included in this sequence. |
| >Referenced SOP Class UID  | (0008,1150) | 1C   | Uniquely identifies the referenced SOP Class. <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.  |
| >Referenced SOP Instance UID   | (0008,1155) | 1C   | Uniquely identifies the referenced SOP Instance. <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.   |

Item 4: Amend PS 3.3, C.8.11.1 DX Series Module

**Table C.8-64  
DX SERIES MODULE ATTRIBUTES**

| Attribute Name | Tag | Type | Attribute Description |
|----------------|-----|------|-----------------------|
| ...            |     |      |                       |

|   |             |    |   |
|---|-------------|----|---|
| <del>Referenced Study Component Sequence-Referenced Performed Procedure Step Sequence</del> | (0008,1111) | 1C | <p><del>Uniquely identifies the Study Component SOP Instance or Modality Performed Procedure Step SOP Instance to which the Series is related. <b>Uniquely identifies the Performed Procedure Step SOP Instance to which the Series is related (e.g. a Modality or General-Purpose Performed Procedure Step SOP Instance or Study Component SOP Instance).</b></del> The Sequence shall have one Item.</p> <p><del>Required if Study Component SOP Class or Modality Performed Procedure Step SOP Class is supported. <b>Required if the Modality Performed Procedure Step SOP Class, General-Purpose Performed Procedure Step SOP Class or Study Component SOP Class is supported.</b></del></p> |
| >Referenced SOP Class UID   | (0008,1150) | 1C | <p>Uniquely identifies the referenced SOP Class.</p> <p>Required if <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.</p>   |
| >Referenced SOP Instance UID  | (0008,1155) | 1C | <p>Uniquely identifies the referenced SOP Instance.</p> <p>Required if <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.</p>  |
| ...   |             |    |   |

Item 5: Amend PS 3.3, C.17.1 SR Document Series Module

**Table C.17-1  
SR DOCUMENT SERIES MODULE ATTRIBUTES**

| Attribute Name | Tag | Type | Attribute Description |
|----------------|-----|------|-----------------------|
| ...            |     |      |                       |

|   |             |    |  |
|---|-------------|----|--|
| <del>Referenced Study Component Sequence</del><br><b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | 2  | Uniquely identifies the Performed Procedure Step SOP Instance for which the Series is created. Only a single Item shall be permitted in this sequence.<br>Notes: 1. The <del>Study Component</del> <b>Performed Procedure Step</b> referred to by this Attribute is the <del>Performed Procedure Step</del> during which this Document is generated.<br>2. If this Document is generated during the same Modality <b>or General-Purpose</b> Performed Procedure Step as the evidence in the current interpretation procedure, this attribute may contain reference to that Modality <b>or General-Purpose</b> Performed Procedure Step.<br>3. This Attribute is not used to convey reference to the evidence in the current interpretation procedure. See Current Requested Procedure Evidence Sequence (0040,A375).<br>4. This Sequence may be sent zero length if the Performed Procedure Step is unknown. |
| >Referenced SOP Class UID   | (0008,1150) | 1C | Uniquely identifies the referenced SOP Class.<br>Required if <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.   |
| > Referenced SOP Instance UID   | (0008,1155) | 1C | Uniquely identifies the referenced SOP Instance.<br>Required if <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> (0008,1111) is sent.  |

*Item 6: Amend PS 3.3, Annex K*

The following is a simple and non-comprehensive illustration of the encoding of the Informative SR Content Tree Example of Figure C.17.4-1.

| SR Tree Depth | Nesting | Attribute  | Tag         | VR | VL (hex) | Value |
|---------------|---------|--|-------------|----|----------|-------|
|               |         | ...  |             |    |          |       |
|               |         | <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | SQ | fffffff  |       |
|               |         | ...  |             |    |          |       |

*Item 7: Amend PS 3.4, Annex F – Study Management Service Class (Normative)*

**F.1 OVERVIEW**

**F.1.1 Scope**

The Study Management Service Class defines an application-level class-of-service which facilitates the creation, scheduling, performance and tracking of imaging studies. Although the primary result from the performance of a study is a group images, there is a host of other information necessary to place the acquired images in the correct context for diagnosis and review. Indeed it is clear that medical professionals do not make

diagnoses from a single image but rather from a group of images and related study information taken together.

Although other Service Classes (e.g. Storage, Query/Retrieval, etc.) partially specify some of the study information (through the use of the Composite IOD metaphor) the primary focus of such Service Classes is images and not studies. This Service Class can be distinguished from such image-oriented Service Classes in that this Service Class focuses on study information and how it relates to the acquired images.

The term Study describes one or more Series of images generated as the result of a request for service. A Study is associated with one or more requested procedures. The Series associated with a Study may be generated by multiple imaging modalities.

A Series is a set of related images generated by a single imaging modality. It is necessary to provide a mechanism whereby the set of Series that a modality produces can be correlated to the Study as defined by the request for service which may involve multiple modalities.

A Study Component describes one or more Series generated on a single imaging modality. ~~The Modality A Performed Procedure Step SOP Class~~ is an extension of ~~the a Study Component SOP Class~~. The Modality Performed Procedure Step SOP Class contains extensions related to the Modality Worklist Management SOP Class. **The General-Purpose Performed Procedure Step SOP Class contains extensions related to the General Purpose Worklist Management Meta SOP Class.**

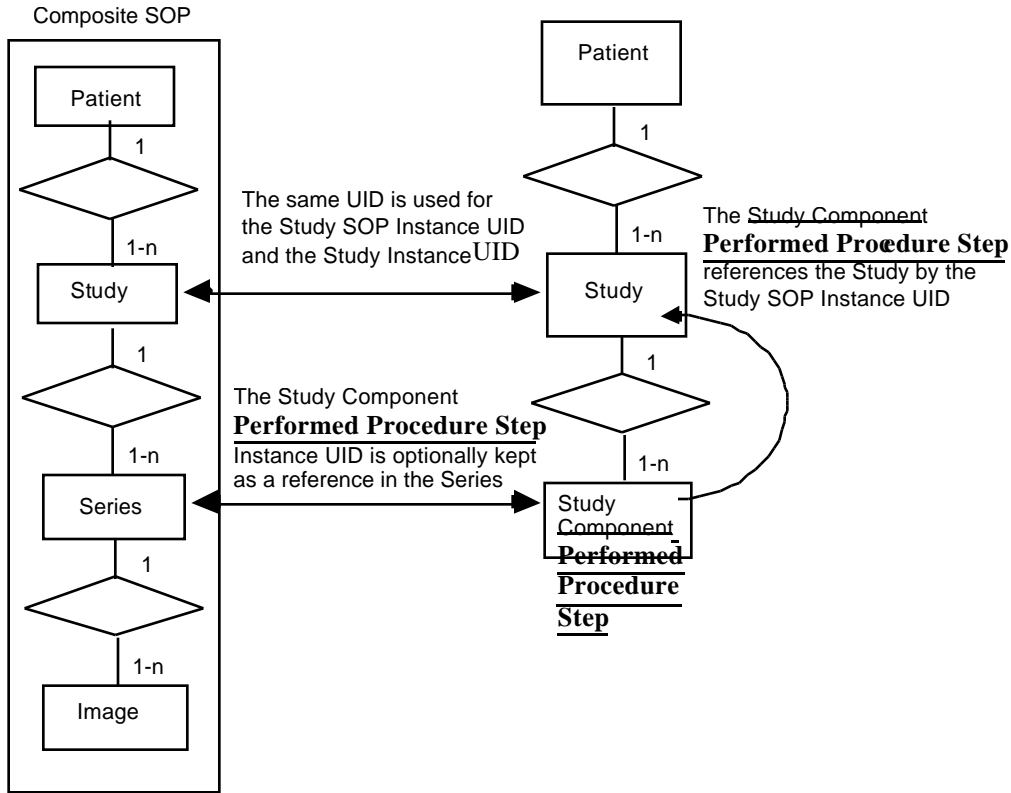
In various places and tables in the DICOM Standard, the term "Study Component" is **was frequently used in earlier publications** as a collective name for ~~both the "Study Component Management" and the "Modality Performed Procedure Step".~~ **"Study Component Management" and any "Performed Procedure Step" (e.g. "Modality Performed Procedure Step" or "General-Purpose Performed Procedure Step").** **In the current publication the more general term "Performed Procedure Step" is used and attribute names and descriptions have been updated accordingly.** The SOP Classes are distinguished by their SOP Class UIDs.

Note: In the ~~Referenced Study Component Sequence~~ **Referenced Performed Procedure Step Sequence** (0008,1111) the Referenced SOP Class UID (0008,1150) can be either the UID of the Study Component Management SOP Class, ~~or~~ the UID of the Modality Performed Procedure Step SOP Class **or the UID of the General-Purpose Performed Procedure Step SOP Class.** The SOP Instance UIDs will not be the same.

DICOM Composite IODs also relate Series of images to a Study. A Study initially represents an Association of Series from the perspective of a single modality, however, the Composite Study may accumulate Series over time from multiple sources (see the Study Content Notification Service Class described in Annex D).

In an environment that supports both Normalized services and Composite services there is a one to many relationship between a Study Management SOP Instance and the Study that is identified in one or more Composite SOP Instances. It is operationally important to link related Composite and Normalized Study Instances. Figure F.1-1 illustrates the relationship between the Composite and Normalized representations of the Study concept. The Detached Study Management SOP Instance UID that identifies a particular Normalized Study Instance may be used to define the Study Instance UID in the related Composite SOP Instances. This same UID is also used in the Referenced Study Sequence Attribute of associated ~~Study Components~~ **Performed Procedure Steps** to link them back to the originally Study.

Because a Composite SOP Instance may contain Series generated by several different pieces of imaging equipment it logically contains multiple ~~Study Components~~ **Performed Procedure Steps**. These ~~Components~~ **Performed Procedure Steps** are optionally tracked in the Composite SOP Instances.



**Figure F.1-1  
RELATIONSHIP BETWEEN COMPOSITE AND NORMALIZED  
REPRESENTATIONS OF THE STUDY CONCEPT**

The goal of the Study Management Service Class is to support Application Entities requiring access to information relating to the scheduling, acquisition and diagnosis of studies. Applications such as patient preparation, room-scheduling, and billing are outside of the scope of this Service Class.

*Item 8: Amend PS 3.4, F.3.2.1.1, Table F.3-2*

**F.3.2.1.1 Study IOD Subset Specification**

The Application Entity which claims conformance to this SOP Class as an SCU may choose to interpret the Attributes maintained by the SCP which the SCU receives via the operations and notifications of the SOP Class. The Application Entity which claims conformance as an SCP to the Detached Study Management SOP Class shall support the subset of the Study IOD Attributes specified in Table F.3-2.

**Table F.3-2  
DETACHED STUDY MANAGEMENT SOP CLASS N-GET ATTRIBUTES**

| Attribute name   | Tag         | Requirement type (SCU/SCP)   |
|--|-------------|--|
| ...  | ...         | ...  |
| <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | 3/1C<br>(Required if a <del>Referenced Study Component</del> <b>Referenced Performed Procedure Step</b> exists.) |



|                              |             |   |
|------------------------------|-------------|---|
| >Referenced SOP Class UID    | (0008,1150) | 3/1C<br>(Required if sequence is present) |
| >Referenced SOP Instance UID | (0008,1155) | 3/1C<br>(Required if sequence is present) |
| ...                          | ...         | ...                                       |

*Item 9: Amend PS 3.4, F.3.5.1, Table F.3-5*

**F.3.5.1 SCU Conformance**

An implementation which is conformant to this SOP Class as an SCU shall meet conformance requirements for the:

- operations which it invokes
- notifications which it receives

**Table F.3-5  
STUDY NOTIFICATION EVENT INFORMATION**

| Event type name | Event type ID | Attribute   | Tag         | Req. type SCU/SCP                         |
|-----------------|---------------|---|-------------|---|
| ...             | ...           | ...   | (0008,0012) | -/1                                       |
| Study Completed | 5             | <del>Referenced Study Component Sequence</del><br><b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | -/1                                       |
|                 |               | >Referenced SOP Class UID   | (0008,1150) | -/1C<br>(Required if sequence is present) |
|                 |               | >Referenced SOP Instance UID  | (0008,1155) | -/1C<br>(Required if sequence is present) |
|                 |               | ...   | ...         | ...                                       |
| Study Verified  | 6             | <del>Referenced Study Component Sequence</del><br><b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | -/1                                       |
|                 |               | >Referenced SOP Class UID   | (0008,1150) | -/1C<br>(Required if sequence is present) |
|                 |               | >Referenced SOP Instance UID  | (0008,1155) | -/1C<br>(Required if sequence is present) |
|                 |               | ...   | ...         | ...                                       |

*Item 10: Amend PS 3.3, C.4.19, Table C.4-19 (from Supplement 52)*

**C.4.19 General Purpose Scheduled Procedure Step Information Module**

**Table C.4-19 General Purpose Scheduled Procedure Step Information Module Attributes**

| Attribute Name   | Tag         | Attribute Description   |
|--|-------------|---|
| ...  | ...         | ...   |
| <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | List of any Modality or General Purpose Performed Procedure Steps, or other Study Components, that may be used to perform the procedure step.<br><br>This sequence may contain references to performed procedure steps resulting from previous contributions to the performance of the procedure step (e.g. an image processing procedure step interrupted, and completed later).<br><br>Zero or more Items may be included in this sequence. |
| >Referenced SOP Class UID  | (0008,1150) | Uniquely identifies the SOP Class.  |
| >Referenced SOP Instance UID   | (0008,1155) | Uniquely identifies the SOP Instance.   |
| ...  | ...         | ...   |

*Item 11: Amend PS 3.4, K.6.2.2.2, Table K.6-2 (from Supplement 52)*

**K.6.2.2.2 General Purpose Worklist Attributes**

Table K.6-2 defines the Attributes of the General Purpose Worklist Information Model:

**Table K.6-2 Attributes for the General Purpose Worklist Information Model**

| Description / Module   | Tag         | Match-<br>ing Key<br>Type | Return<br>Key<br>Type | Remark /<br>Matching Type |
|--|-------------|---------------------------|-----------------------|---------------------------|
| ...  |             |                           |                       |                           |
| <del>Referenced Study Component Sequence</del> <b>Referenced Performed Procedure Step Sequence</b> | (0008,1111) | O                         | 2                     |                           |
| >Referenced SOP Class UID  | (0008,1150) | O                         | 1                     |                           |
| >Referenced SOP Instance UID   | (0008,1155) | O                         | 1                     |                           |
| ...  |             |                           |                       |                           |

*Item 12: Amend PS 3.6, Section 6*

| Tag | Name | VR | VM |
|-----|------|----|----|
|-----|------|----|----|

...

CP-257  
Clarify Referenced Study Component Sequence

Date 2000/09/04

Sta

(0008,1111)

~~Referenced Study Component Sequence~~  
**Referenced Performed Procedure Step Sequence**

SQ

1

...