DICOM Change Proposal

STATUS	Assigned
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Change Number	CP-2577
Log Summary: Fix empty N-CREATE conflict with PPS Discontinuation Reason workflow	
Name of Standard PS3.4	

Rationale for Change:

CP-1738 introduced the prohibition of sending empty Type 3 attributes. However, this creates a conflict with existing DICOM requirements for Performed Procedure Step (PPS) workflow.

DICOM PS3.4 Section F.7.2, Note 5 states: "Only Attributes that are specified in a SOP Instance at N-CREATE may later be updated through the N-SET. If an SCU wishes to use the PPS Discontinuation Reason Code Sequence (0040,0281), it must create that Attribute (zero-length) during N-CREATE."

This creates an impossible scenario:

- To later send a discontinuation reason, the modality must create the Performed Procedure Step Discontinuation Reason Code Sequence (0040,0281) as zero-length (empty) during N-CREATE

- PS3.4 Section 5.4.2.1 prohibits sending empty Type 3 attributes in N-SET operations

- The SCU cannot comply with both requirements - it must send an empty Type 3 attribute in N-CREATE to enable later N-SET updates, but cannot subsequently use N-SET to provide the actual value due to Section 5.4.2.1 restrictions.

This CP resolves the conflict by changing the usage specification for (0040,0281) to require optional creation during N-CREATE and N-SET operations.

Change Wording:

Update PS3.4 Section 5.4.2.1 DIMSE Service N-CREATE, N-SET, N-ACTION, as follows:

5 ## 5.4.2.1 DIMSE Service N-CREATE, N-SET, N-ACTION

The following Requirements apply when specifying the use of DIMSE Services N-CREATE, N-SET, N-ACTION.

The convention used in the table below are as follows:

SCU Behavior

Mandatory   The SCU shall provide the Attribute.

10 **Optional**   The SCU may or may not provide the Attribute.

Undefined   The SCU's usage of the Attribute is undefined.

SCP Behavior

Mandatory   The SCP shall support receiving the Attribute.

Mandatory with Default	The SCP shall support receiving the Attribute. Upon receiving zero-length values, the SCP shall assign values as defined by the specification of the Service Class.
Optional	The SCP may or may not support receiving the Attribute.
Undefined	The SCP's support of the Attribute is undefined.

Table 5.4.2-1. SCU and SCP Attribute Usage and Zero-Length Encoding Requirements for DIMSE N-CREATE, N-SET, and N-ACTION

	SCU		SCP
Usage	**Requirement**	**Zero Length**	**Requirement**
1/1	Mandatory	Not Permitted	Mandatory
2/1	Mandatory	Permitted	Mandatory with Default
2/2	Mandatory	Permitted	Mandatory
3/1	Optional	Not Permitted	Mandatory
3/2	Optional	~~Not~~ Permitted	Optional
3/3	Optional	~~Not~~ Permitted	Optional
-/-	Undefined	Undefined	Undefined

If the SCU does not provide an Attribute that is Mandatory for the SCU, the SCP shall respond with a Failure Status Code of 0120H "Missing Attribute".

If the SCU provides a zero-length value for a Mandatory Attribute when zero length is not permitted, the SCP shall respond with a Failure Status Code of 0121H "Missing Attribute Value".

Only Attributes that are specified as top level attributes in a SOP Instance at N-CREATE may later be updated through the N-SET. For example, the PPS Discontinuation Reason Code Sequence (0040,0281) needs to be present in the N-CREATE request (with a zero-length value) if a discontinuation code might be provided later.

A top level Sequence Attribute may be replaced by an N-SET operation. Modification of the contents of the Sequence requires providing the complete new Sequence value.

> *Update PS3.4 Section F.7.2.1.1 Modality Performed Procedure Step Subset Specification, as follows:*

F.7.2.1.1 Modality Performed Procedure Step Subset Specification
…

Table F.7.2-1. Modality Performed Procedure Step SOP Class N-CREATE, N-SET and Final State Attributes

Attribute Name	Tag	Usage N-CREATE (SCU/SCP)	Usage N-SET (SCU/SCP)	Usage Final State (see Note 1)
…				
Performed Procedure Step Information				
Performed Procedure Step ID	(0040,0253)	1/1	Not allowed	
Performed Station AE Title	(0040,0241)	1/1	Not allowed	

Attribute Name	Tag	Usage N-CREATE (SCU/SCP)	Usage N-SET (SCU/SCP)	Usage Final State (see Note 1)
Performed Station Name	(0040,0242)	2/2	Not allowed	
Performed Location	(0040,0243)	2/2	Not allowed	
Performed Procedure Step Start Date	(0040,0244)	1/1	Not allowed	
Performed Procedure Step Start Time	(0040,0245)	1/1	Not allowed	
Performed Procedure Step Status	(0040,0252)	1/1	3/1	
Performed Procedure Step Description	(0040,0254)	2/2	3/2	
Performed Procedure Type Description	(0040,0255)	2/2	3/2	
Procedure Code Sequence	(0008,1032)	2/2	3/2	
>Include Table F.7.2-1e "Modality Performed Procedure Step Enhanced Code Value Macro with N-SET, Optional Meaning"				
Reason For Performed Procedure Code Sequence	(0040,1012)	3/3	3/3	
>Include Table F.7.2-1c "Modality Performed Procedure Step Enhanced Code Value Macro with N-SET, Mandatory Meaning"				
Performed Procedure Step End Date	(0040,0250)	2/2	3/1	1
Performed Procedure Step End Time	(0040,0251)	2/2	3/1	1
Comments on the Performed Procedure Step	(0040,0280)	3/3	3/3	
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	3/3	3/3	
>Include Table F.7.2-1c "Modality Performed Procedure Step Enhanced Code Value Macro with N-SET, Mandatory Meaning"				
Image Acquisition Results				
…				

Note

1. The requirement for the final state is that which applies at the time that the Performed Procedure Step Status (0040,0252) is N-SET to a value of COMPLETED or DISCONTINUED, as described in Section F.7.2.2.2. It is only described if it is different from the SCP requirement for the N-CREATE.

2. The Performed Series Sequence (0040,0340) may not be empty (zero length) at the time that the Performed Procedure Step Status (0040,0252) is N-SET to a value of COMPLETED or DISCONTINUED. In other words a Series must exist for every Performed Procedure Step, though it may contain no Images or Non-Image Composite objects, if none were created, as described in Section F.7.2.2.2.

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45   3.   Attributes (0040,1006) Placer Order Number/Procedure and (0040,1007) Filler Order Number/Procedure were previously defined in DICOM. They are now retired (see PS3.3-1998).

    4.   Attributes (0040,2006) and (0040,2007) were previously defined in DICOM. They are now retired (see PS3.3-1998).

50   5.   ~~Only Attributes that are specified in a SOP Instance at N-CREATE may later be updated through the N-SET. If an SCU wishes to use the PPS Discontinuation Reason Code Sequence (0040,0281), it must create that Attribute (zero-length) during N-CREATE.~~

    ~~6~~5.   The Radiation Dose Module was previously defined in DICOM. This is now retired (see PS3.3-2017c).