DICOM Correction Proposal

STATUS	~~Letter Ballot~~Draft Final Text
Date of Last Update	2023/08/24
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Correction Number	CP-2342
Log Summary: Add Clinical Fraction Number to 1st Generation RT Objects	
Name of Standard PS3.3 2024d	
Rationale for Correction:	

When a radiotherapy treatment plan requires adaptation along the course of treatment delivery, the Number of Fractions Planned (300A,0078) value is typically lower than in the predecessor plan and the Current Fraction Number (3008,0022) is reset to 1 in the corresponding treatment records. In order to be able to track the progress of the treatment delivery irrespective of the treatment plan version, the Clinical Fraction Number (300A,0705) was introduced in 2nd Generation RT Objects.

This correction adds the Clinical Fraction Number (300A,0705) to 1st Generation RT Objects.

[Comment. UG Austria: Attribute Clinical Fraction Number (300A,0705) is added to different modules and has different descriptions there: being a "Count", a "Number" or an "Identification" – this could be aligned. TBD.] → Formatted: Highlight

[Comment. UG Austria: 8.8.21.n: Capitalized terms: "RT Beam", "Fraction Group", "Referenced Beam", "RT Plan", "RT Treatment Fractions", "RT Beams Session Record", "Adapted RT Radiations",… This also applies to some existing Attribute descriptions, e.g., fraction group is capitalized in some modules and in some others not. REJECTED. Beyond the scope of this CP to fix. Another CP could be initiated, or this could be fixed editorially if WG 7 agrees.] → Formatted: Highlight; Formatted: Font: Italic

Correction Wording:

In PS 3.3, C.8.8.21 RT Beams Session Record Module, modify Table C.8-57 as follows

C.8.8.21 RT Beams Session Record Module

Table C.8-57. RT Beams Session Record Module Attributes

Attribute Name	Tag	Type	Attribute Description
Referenced Fraction Group Number	(300C,0022)	3	Identifier of Fraction Group within referenced RT Plan.
Number of Fractions Planned	(300A,0078)	2	Total number of treatments (Fractions) planned for current Fraction Group.
…			
Treatment Session Beam Sequence	(3008,0020)	1	Sequence of Beams administered during treatment session. One or more Items shall be included in this Sequence.
>Referenced Beam Number	(300C,0006)	3	References Beam specified by Beam Number (300A,00C0) in

Attribute Name	Tag	Type	Attribute Description
			Beam Sequence (300A,00B0) in RT Beams Module within referenced RT Plan.
…			
>Current Fraction Number	(3008,0022)	2	Fraction number for this beam administration. **See C.8.8.21.n.**
>Clinical Fraction Number	**(300A,0705)**	**3**	Count of the RT Treatment Fractions that have been delivered, irrespective of the plan version used. **See C.8.8.21.n.**
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C.8.8.21.n Current Fraction Number and Clinical Fraction Number

Each RT Beam of a treatment plan is typically included in a Fraction Group. The number of fractions to be delivered is defined in the Number of Fractions Planned (300A,0078).

The Clinical Fraction Number (300A,0705) tracks the clinical progress of treatment delivery.

It is a counter that represents an ordinal count of deliveries of fractions within a radiotherapy treatment serving a given combination of prescriptions.

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When it is used prospectively in instructions, the value indicates the ordinal count of the treatment fraction to be delivered in the upcoming treatment session. When the upcoming delivery of therapeutic radiation is intended to consist of the complete delivery of the RT Beams referred to by the Fraction Group serving the same combination of prescriptions as the previous fraction, the value is incremented. When the upcoming delivery of therapeutic radiation is intended to resume the delivery of a previously incomplete fraction, the value is not incremented, i.e. the value is the same as that of the resumed fraction.

When it is used retrospectively in recording, the value indicates the ordinal count, irrespective of any modification of the treatment plan, of the fraction which has been delivered.

The Current Fraction Number (3008,0022) tracks the clinical progress of treatment delivery for a Referenced Beam within the referenced RT Plan.

When it is used prospectively in instructions, the value indicates the ordinal count of the treatment to be delivered with the referenced RT Plan. When the upcoming delivery of therapeutic radiation is intended to consist of the complete delivery of the RT Beams referred to by the Fraction Group, the value is incremented. When the upcoming delivery of therapeutic radiation is intended to resume the delivery of a previously incomplete fraction, the value is not incremented, i.e. the value is the same as that of the resumed fraction.

When it is used retrospectively in recording, the value indicates the ordinal count for the treatment plan of the fraction which has been delivered.

Note

1. If the same RT Plan is used for all treatments, the values of Current Fraction Number (3008,0022) and the Clinical Fraction Number (300A,0705) have the same values.

2. For some adaptive treatment approaches, details of the device parameters may be altered at the treatment session to accommodate the current position and shape of the patient. In this case, a new RT Plan SOP Instance is used for the subsequent RT Treatment Fractions serving the same set of RT Prescriptions and the Current Fraction Number (3008,0022) re-starts at 1.

3. The Clinical Fraction Number (300A,0705) is continuously incremented to reflect the clinical progress of a therapeutic series of treatments. In the RT Beams Session Record for the last of the intended RT Treatment Fractions, this value will usually be equal to the Number of Fractions Planned (300A,0078) present in the corresponding Fraction Group.

Example

RT Plan P contains RT Beams A, B in a Fraction Group; Adapted RT Radiations indicated by (') and ('') ; RT Plans created are P, P' and P''.

Table C.8.8.21-2. Delivery of Multiple RT Plan Instances

Treatment Session	RT Plan	Delivered RT Beams	Clinical Fraction Number (300A,0705)	Current Fraction Number (3008,0022)
1	P	A,B	1	1 (of P)
2	P	A,B	2	2 (of P)
3	P'	A',B'	3	1 (of P')
4	P'	A',B'	4	2 (of P')
5	P''	A'',B''	5	1 (of P'')
6	P	A,B	6	3 (of P)

In PS 3.3, C.8.8.26 RT Ion Beams Session Record Module, modify Table C.8.8.26-1 as follows

C.8.8.26 RT Ion Beams Session Record Module

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Table C.8.8.26-1. RT Ion Beams Session Record Module Attributes

Attribute Name	Tag	Type	Attribute Description
Referenced Fraction Group Number	(300C,0022)	3	Identifier of fraction group within referenced RT Ion Plan.
Number of Fractions Planned	(300A,0078)	2	Total number of treatments (fractions) planned for current fraction group.
…			
Treatment Session Ion Beam Sequence	(3008,0021)	1	Sequence of setup and/or treatment beams administered during treatment session. One or more Items shall be included in this Sequence.
>Referenced Beam Number	(300C,0006)	1	References Beam specified by Beam Number (300A,00C0) in Ion Beam Sequence (300A,03A2) in RT Ion Beams Module within the referenced RT Ion Plan.
…			
>Current Fraction Number	(3008,0022)	2	Fraction number for this beam administration. **See C.8.8.21.n.**
>Clinical Fraction Number	**(300A,0705)**	**3**	**Count of the RT Treatment Fractions that have been delivered, irrespective of the plan version used.** **See Section C.8.8.21.n**
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C.8.8.29 RT Beams Delivery Instruction Module

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Table C.8.8.29-1. RT Beams Delivery Instruction Module Attributes

Attribute Name	Tag	Type	Attribute Description
Referenced RT Plan Sequence	(300C,0002)	1	Reference to a single RT Plan or RT Ion Plan SOP Instance (whose UID is also supplied in the Input Information Sequence - see PS3.4) containing all the Beams and the Fraction Group referenced in this SOP Instance. Only a single Item shall be included in this Sequence.
>*Include Table 10-11 "SOP Instance Reference Macro Attributes"*			
Beam Task Sequence	(0074,1020)	1	Specification of beams to be delivered and/or used for verification of the patient position. One or more Items shall be included in this Sequence.
>…			
>Current Fraction Number	(3008,0022)	1	The index of the fraction that is to be delivered or completed in this session. See Section C.8.8.29.1 **and C.8.8.21.n.**.
>Clinical Fraction Number	**(300A,0705)**	**3**	==A number== that indicates the RT Treatment Fraction to delivered. **See C.8.8.21.n.**
>Referenced Fraction Group Number	(300C,0022)	1C	Indicates which fraction group of the referenced plan is to be treated in the treatment session. Only one Fraction Group shall be specified per Delivery Instruction SOP Instance. Required if the referenced plan has more than one Fraction Group Sequence (300A,0070) Item.
>Referenced Beam Number	(300C,0006)	1	Uniquely identifies the Beam that is specified by Beam Number (300A,00C0) within Beam Sequence (300A,00B0) in RT Beams Module of referenced RT Plan or within Ion Beam Sequence (300A,03A2) in RT Ion Beams Module of the referenced RT Ion Plan.
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C.8.8.29.1 Current Fraction Number

For beams with a Treatment Delivery Type (300A,00CE) of CONTINUATION, the Current Fraction Number (3008,0022) is that of the original fraction to be completed by the current beam.

C.8.8.2 RT Image Module

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Table C.8-38. RT Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
…			
Referenced RT Plan Sequence	(300C,0002)	3	Sequence of one Class/Instance pair describing RT Plan associated with image. Only a single Item is permitted in this Sequence.
>Include Table 10-11 "SOP Instance Reference Macro Attributes"			
Referenced Beam Number	(300C,0006)	3	Uniquely identifies the corresponding N-segment treatment beam specified by Beam Number (300A,00C0) within Beam Sequence (300A,00B0) in RT Beams Module within the RT Plan referenced in Referenced RT Plan Sequence (300C,0002) or the Ion Beam Sequence (300A,03A2) in the RT Ion Beams Module within the RT Ion Plan referenced in Referenced RT Plan Sequence (300C,0002).
Referenced Fraction Group Number	(300C,0022)	3	Identifier of Fraction Group within RT Plan referenced in Referenced RT Plan Sequence (300C,0002).
Fraction Number	(3002,0029)	3	Fraction Number of fraction during which image was acquired, within Fraction Group referenced by Referenced Fraction Group Number (300C,0022) within RT Plan referenced in Referenced RT Plan Sequence (300C,0002). **See C.8.8.2.n.**
Clinical Fraction Number	**(300A,0705)**	**3**	**Identification of the RT Treatment Fraction of the referenced RT Beam during which image was acquired.** **See C.8.8.21.n.**
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C.8.8.2.n Fraction Number

The Attribute Fraction Number (3002,0029) in this Module, is equivalent to the Current Fraction Number (3008,0022). See C.8.8.21.n.