

DICOM Correction Item

Correction Number	CP-668
Log Summary: Use transverse not axial for cross-sectional images	
Type of Modification	Name of Standard
Addition	PS 3.3, 3.17 2007
Rationale for Correction	
The term "axial" is common in practice, but is incorrectly used as equivalent to "transverse" (relative to coronal or sagittal), since the axis to which axial is relative is not defined.	
DICOM has traditionally used "transverse" and that is what is specified in PS 3.17 Annex A Explanation of patient orientation (normative).	
Sections of documents affected	
PS 3.3 C.7.4.1.1.1, C.8.2.1.1.1, C.8.8.3.2, C.8.9.1.1.4, C.23.3	
PS 3.17 V.2.2, V.4.3	
Correction Wording:	

Amend PS 3.3, C.7.4.1 Frame Of Reference Module

C.7.4.1.1.1 Frame Of Reference UID

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- Notes:
1. Previous versions of this Standard defined a Data Element "Location", which has been retired. Frame of Reference UID provides a completely unambiguous identification of the image location reference used to indicate position.
 2. A common Frame of Reference UID may be used to spatially relate localizer images with a set of **axial transverse** images. However, in some cases (eg. multiple localizer images being related to a single set of **axial transverse** images) a common Frame of Reference UID may not be sufficient. The Referenced Image Sequence (0008,1140) provides an unambiguous method for relating localizer images.

Amend PS 3.3, C.8.2.1 CT Image Module

C.8.2.1.1.1 Image Type

For CT Images, Image Type (0008,0008) is specified to be Type 1 and uses one of the following Defined Terms for Value 3:

- | | |
|-----------|---------------------------------|
| AXIAL | identifies a CT Axial Image |
| LOCALIZER | identifies a CT Localizer Image |

Note: Axial in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.

Amend PS 3.3, C.8.8.3 RT Dose Module

C.8.8.3.2 Grid Frame Offset Vector

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This attribute is conditional since the RT Dose module may be included even if pixel doses are not being transmitted, or the image may be a single-frame image. If the Multi-frame Module is present, Frame Increment Pointer (0028,0009) shall have the Enumerated Value of 3004000C (Grid Frame Offset Vector).

Note: Option (a) can represent a rectangular-parallelepiped dose grid with any orientation with respect to the patient, while option (b) can only represent a rectangular-parallelepiped dose grid whose planes are in the **axial transverse** patient dimension and whose x- and y-axes are parallel to the patient x- and y-axes.

Example: Figure C.8.8.3-1 shows an example of plane positions for a dose grid with **axial transverse** planes.

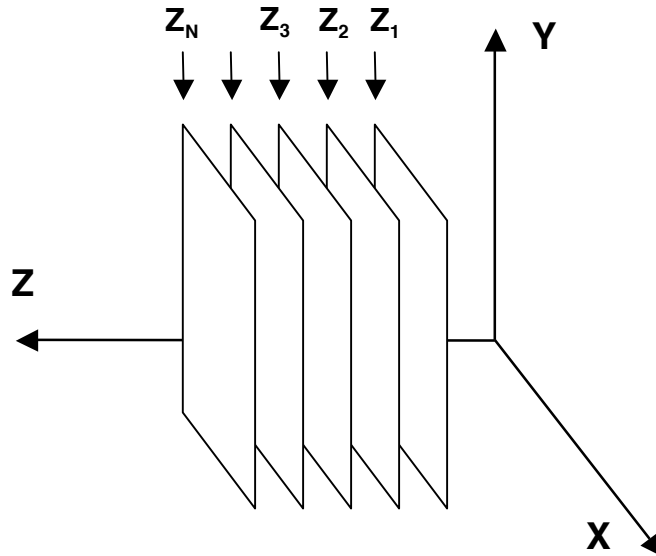


Figure C.8.8.3-1 Dose Grid Frame Example

For this example, Table C.8.39b gives the values of elements in the Grid Frame Offset Vector (3004,000C) for both relative (option (a)) and absolute (option (b)) interpretations, under the following conditions:

1. The value of Image Orientation (Patient) (0020,0037) is (1,0,0,0,1,0). I.e., the dose grid is **axial transverse** with x- and y-axes parallel to the patient x- and y-axes;
2. The value of Image Position (Patient) (0020,0032), i.e. the position of the first element of the dose grid, is (4, 5, 6); and
3. The spacing between adjacent dose grid planes is 2mm (uniform).

Amend PS 3.3, C.8.9.1 PET Series Module

C.8.9.1.1.4 Series Type

The Series Type (0054,1000), Value 1 is used to identify the spatial location and temporal nature of the images within a PET Series. The Enumerated Values and their definitions are:

- STATIC = a group of images at varying spatial locations at the same time
- DYNAMIC = a group of images at a set of spatial locations (e.g. slices) at varying time slices, with all spatial locations acquired at all time slices
- GATED = a group of images at the same spatial location, same starting and ending time, but acquired in different time slots of (possibly) different R-R intervals
- WHOLE BODY = same as STATIC, except covering multiple **axial transverse** fields of view (and therefore acquired at a different time).

- Notes: 1. Using this definition and the comments in C.8.9.1.1.1, here are some examples of PET series and the encoding of Series Type (0054,1000) Value 1.
- Static acquisition: a group of n transverse images at varying superior<->inferior locations, all acquired between the same starting and ending time. Series Type = STATIC.
 - Dynamic acquisition: a group of n*m transverse images at n superior<->inferior locations, acquired with m different starting and ending times. Series Type = DYNAMIC.
 - Gated acquisition: a group of n*m*p transverse images at n superior<->inferior locations, all acquired between the same starting and ending time, acquired in m different R-R Intervals (as determined by Low R-R Value (0018,1081) and High R-R Value (0018,1082)), and acquired in p time slots of a given R-R Interval (as determined by Trigger Time (0054,1000)). Series Type = GATED.
 - Whole body acquisition: a group of n transverse images at varying superior<->inferior locations covering a significant fraction of the entire body. Series Type = WHOLE BODY.
 - Multiple **axial transverse** fields of view: a group of n transverse images at varying superior<->inferior locations. Series Type = WHOLE BODY.
 - Interleaved: group of 2*n transverse images acquired at overlapped AFOVs to increase **axial transverse** sampling. Series Type = WHOLE BODY.
 - Sagittal (Coronal, Oblique): sagittal (coronal, oblique) re-sliced images derived by reformatting transverse images. The Series Type is STATIC, DYNAMIC, GATED, or WHOLE BODY depending on source Series Type.
 - Arithmetic: images derived by an arithmetic operation on operand images. The Series Type is STATIC, DYNAMIC, GATED, or WHOLE BODY depending on source Series Type.
 - Metabolic: images derived by a metabolic model. The Series Type is STATIC, DYNAMIC, GATED, or WHOLE BODY depending on source Series Type.

Amend PS 3.3, C.23.3 Hanging Protocol Display Module

C.23.3 Hanging Protocol Display Module

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**Table C.23.3-1
 Hanging Protocol Display Module Attributes**

Attribute Name	Tag	Type	Attribute Description
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Attribute Name	Tag	Type	Attribute Description
>Reformatting Operation Initial View Direction	(0072,0516)	1C	Initial view of the reformatted images. Required if the value of Reformatting Operation Type (0072,0510) is MPR or 3D_RENDERING. May be present otherwise. Defined Terms: SAGITTAL, AXIAL TRANSVERSE , CORONAL, OBLIQUE
>3D Rendering Type	(0072,0520)	1C	Describes the intended 3D rendering type. One or more values shall be present. The first value shall not be zero length. Required if the value of Reformatting Operation Type (0072,0510) is 3D_RENDERING: Defined Terms for value 1: MIP, SURFACE, VOLUME Additional values may be used to identify implementation specific sub-types.

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C.23.3.1.1 Filter Operations Sequence

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When Filter-by Category (0072,0402) has a value of IMAGE_PLANE, Selector Attribute VR (0072,0050) shall have a value of "CS", and abstract enumerated values shall be used for the value of the associated Selector CS Value (0072,0062) attribute, which may be computed from the values of Image Orientation (Patient) (0020,0037) or Patient Orientation (0020,0020).
 Enumerated Values: **AXIAL TRANSVERSE**, CORONAL, SAGITTAL, OBLIQUE.

Amend PS 3.17 Hanging Protocol example process flow illustration:

V.2 HANGING PROTOCOL INTERNAL PROCESS MODEL

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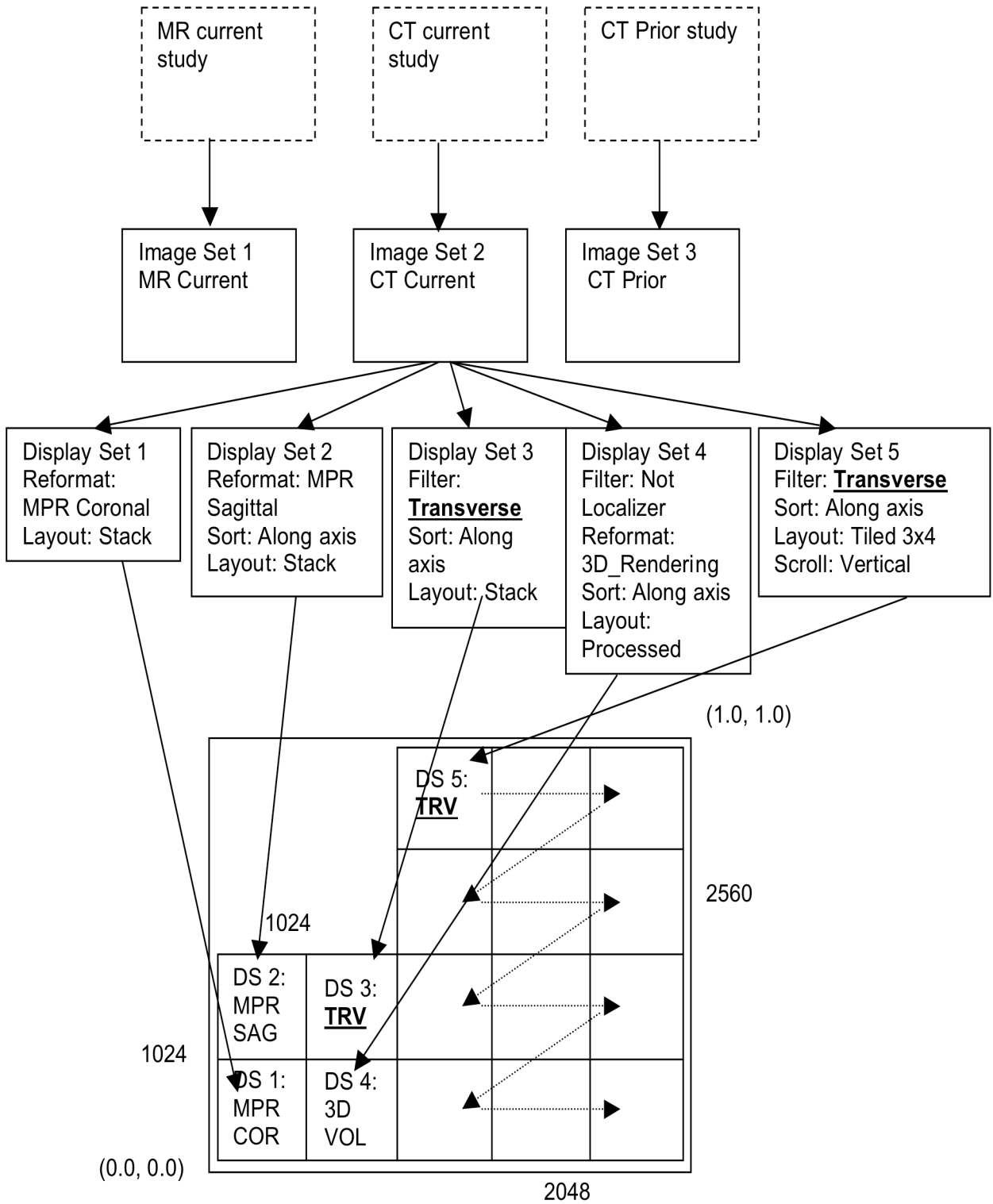


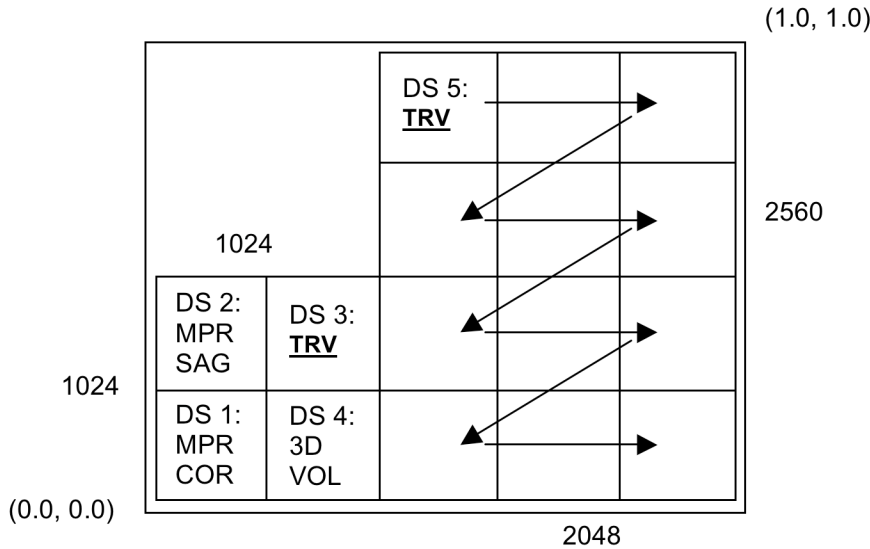
Figure V.2-2 Example Process Flow

Amend PS 3.17 Hanging Protocol Examples:

V.4.3 Hanging Protocol Display Module

Display Sets Sequence:

[Group #1 is CT only display (current CT)]

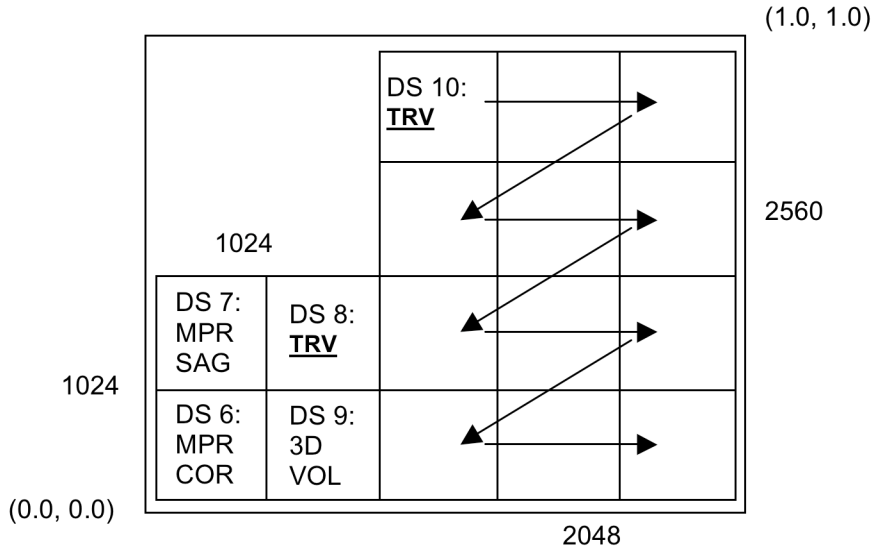


- Item 1:
- Display Set Number: 1
- Display Set Presentation Group: 1
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [lower left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 512/2560), (512/3072,0/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~ TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "CORONAL"
- Display Set Patient Orientation: "L\F"

- VOI Type: BRAIN
- Display Set Presentation Group Description: "Current CT only"
- Item 2:
- Display Set Number: 2
- Display Set Presentation Group: 1
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [upper left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 1024/2560), (512/3072, 512/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "SAGITTAL"
- Display Set Patient Orientation: "P\F"
- VOI Type: BRAIN
- Item 3:
- Display Set Number: 3
- Display Set Presentation Group: 1
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [upper right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 1024/2560), (1024/3072, 512/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"
- Item 4:
- Display Set Number: 4
- Display Set Presentation Group: 1

- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [lower right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 512/2560), (1024/3072, 0/2560)
 - Image Box Layout Type: "PROCESSED"
- Filter Operations Sequence:
 - Item 1:
 - Selector Attribute: (0008,0008) [Image Type]
 - Selector Attribute VR: "CS"
 - Selector CS Value: "LOCALIZER "
 - Selector Value Number: 3
 - Filter-by Operator: "NOT_MEMBER_OF"
- Sorting Operations Sequence: *zero length*
- Reformatting Operation Type: "3D_RENDERING"
- Reformatting Operation Initial View Direction: "CORONAL"
- 3D Rendering Type: "VOLUME"
- Display Set Patient Orientation: "X\F"
- Show Graphic Annotation Flag: "NO"
- Item 5:
- Display Set Number: 5
- Display Set Presentation Group: 1
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [entire 2048x2560 space]
 - Image Box Number: 1
 - Display Environment Spatial Position: (1024/3072, 2560/2560), (3072/3072, 0/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 4
 - Image Box Scroll Direction: "VERTICAL"
 - Image Box Small Scroll Type: "ROW_COLUMN"
 - Image Box Small Scroll Amount: 1
 - Image Box Large Scroll Type: "PAGE"
 - Image Box Large Scroll Amount: 1
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL_TRANSVERSE~~"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"

[Group #2 is MR only display]

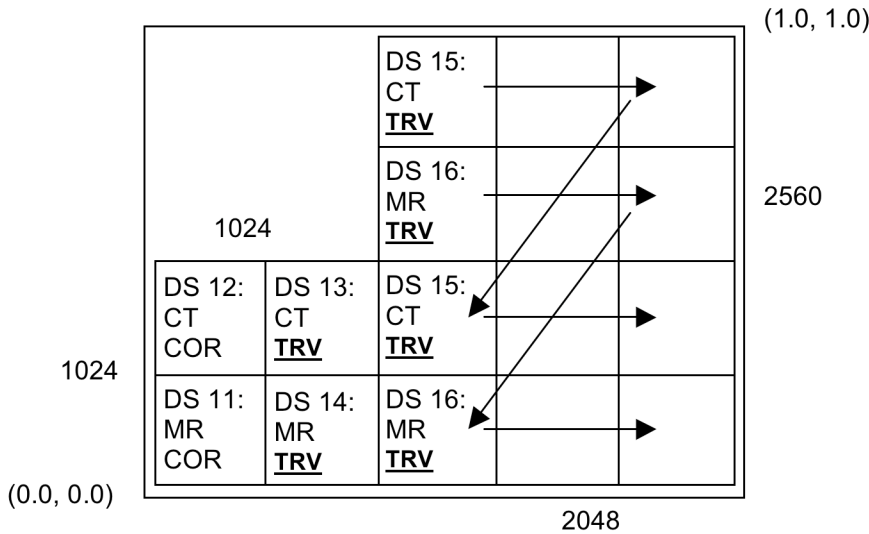


- Item 6:
- Display Set Number: 6
- Display Set Presentation Group: 2
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [lower left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 512/2560), (512/3072,0/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~ TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "CORONAL"
- Display Set Patient Orientation: "P\F"
- Display Set Presentation Group Description: "MR only"
- Item 7:
- Display Set Number: 7
- Display Set Presentation Group: 2
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [upper left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 1024/2560), (512/3072, 512/2560)
 - Image Box Layout Type: "STACK"

- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "SAGITTAL"
- Display Set Patient Orientation: "P\F"
- Item 8:
- Display Set Number: 8
- Display Set Presentation Group: 2
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [upper right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 1024/2560), (1024/3072, 512/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\P"
- Item 9:
- Display Set Number: 9
- Display Set Presentation Group: 2
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [lower right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 512/2560), (1024/3072, 0/2560)
 - Image Box Layout Type: "PROCESSED"
- Filter Operations Sequence: *zero length*
- Sorting Operations Sequence: *zero length*
- Reformatting Operation Type: "3D_RENDERING"
- Reformatting Operation Initial View Direction: "CORONAL"
- 3D Rendering Type: "VOLUME"
- Display Set Patient Orientation: "X\F"
- Item 10:
- Display Set Number: 10

- Display Set Presentation Group: 2
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [entire 2048x2560 space]
 - Image Box Number: 1
 - Display Environment Spatial Position: (1024/3072, 2560/2560), (3072/3072, 0/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 4
 - Image Box Scroll Direction: "VERTICAL"
 - Image Box Small Scroll Type: "ROW_COLUMN"
 - Image Box Small Scroll Amount: 1
 - Image Box Large Scroll Type: "PAGE"
 - Image Box Large Scroll Amount: 1
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~ **TRANSVERSE**"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\^P"

[Group #3 is combined MR & CT]



- Item 11: [MR coronal]
- Display Set Number: 11
- Display Set Presentation Group: 3
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [lower left quadrant of 1024x1024]
 - Image Box Number: 1

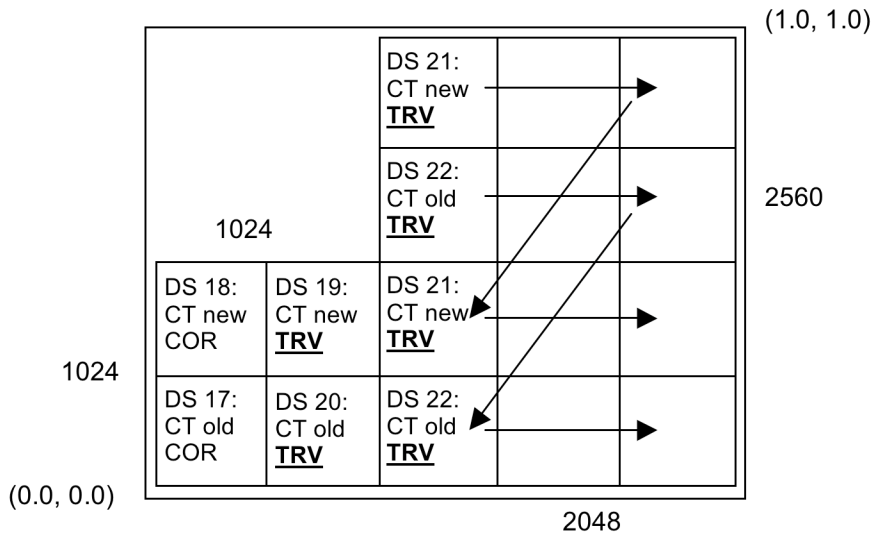
- Display Environment Spatial Position: (0/3072, 512/2560), (512/3072,0/2560)
- Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "CORONAL"
- Display Set Patient Orientation: "L\F"
- Show Graphic Annotation Flag: "NO"
- Display Set Presentation Group Description: "MR & CT combined"
- Item 12: [CT coronal]
- Display Set Number: 12
- Display Set Presentation Group: 3
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [upper left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 1024/2560), (512/3072, 512/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "CORONAL"
- Display Set Patient Orientation: "L\F"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "NO"
- Item 13: [CT ~~axial~~transverse]
- Display Set Number: 13
- Display Set Presentation Group: 3
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [upper right quadrant of 1024x1024]
 - Image Box Number: 1

- Display Environment Spatial Position: (512/3072, 1024/2560), (1024/3072, 512/2560)
- Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\^P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"
- Item 14: [MR ~~axial~~ transverse]
- Display Set Number: 14
- Display Set Presentation Group: 3
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [lower right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 512/2560), (1024/3072, 0/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\^P"
- Show Graphic Annotation Flag: "NO"
- Item 15: [CT two part scrolled, rows 1 & 3]
- Display Set Number: 15
- Display Set Presentation Group: 3
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [row 1 (top row) of 2048x2560 space]
 - Image Box Number: 1
 - Display Environment Spatial Position: (1024/3072, 2048/2560), (3072/3072, 1536/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"
 - Image Box Small Scroll Type: "IMAGE"
 - Image Box Small Scroll Amount: 1

- Image Box Large Scroll Type: "ROW_COLUMN"
- Image Box Large Scroll Amount: 1
- Item 2: [row 3 of 2048x2560 space]
- Image Box Number: 2
- Display Environment Spatial Position: (1024/3072, 1024/2560), (3072/3072, 512/2560)
- Image Box Layout Type: "TILED"
- Image Box Tile Horizontal Dimension: 3
- Image Box Tile Vertical Dimension: 1
- Image Box Scroll Direction: "HORIZONTAL"
- Image Box Small Scroll Type: "IMAGE"
- Image Box Small Scroll Amount: 1
- Image Box Large Scroll Type: "ROW_COLUMN"
- Image Box Large Scroll Amount: 1
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~ TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\^P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"
- Item 16: [MR two part scrolled, rows 2 & 4]
- Display Set Number: 16
- Display Set Presentation Group: 3
- Image Set Number: 1
- Image Boxes Sequence:
 - Item 1: [row 2 of 2048x2560 space]
 - Image Box Number: 1
 - Display Environment Spatial Position: (1024/3072, 1536/2560), (3072/3072, 1024/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"
 - Image Box Small Scroll Type: "IMAGE"
 - Image Box Small Scroll Amount: 1
 - Image Box Large Scroll Type: "ROW_COLUMN"
 - Image Box Large Scroll Amount: 1
 - Item 2: [row 4 (bottom row) of 2048x2560 space]
 - Image Box Number: 2
 - Display Environment Spatial Position: (1024/3072, 512/2560), (3072/3072, 0/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"

- Image Box Small Scroll Type: "IMAGE"
- Image Box Small Scroll Amount: 1
- Image Box Large Scroll Type: "ROW_COLUMN"
- Image Box Large Scroll Amount: 1
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\^P"
- Show Graphic Annotation Flag: "NO"

[Group #4 is combined CT new & CT old]



- Item 17: [CT old coronal]
- Display Set Number: 17
- Display Set Presentation Group: 4
- Image Set Number: 3
- Image Boxes Sequence:
 - Item 1: [lower left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 512/2560), (512/3072,0/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:

- Sort-by Category: "ALONG_AXIS"
- Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "CORONAL"
- Display Set Patient Orientation: "L\F"
- VOI Type: BRAIN
- Display Set Presentation Group Description: "CT old & CT new combined"
- Item 18: [CT new coronal]
- Display Set Number: 18
- Display Set Presentation Group: 4
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [upper left quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (0/3072, 1024/2560), (512/3072, 512/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL_TRANSVERSE~~"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Reformatting Operation Type: "MPR"
- Reformatting Thickness: 5
- Reformatting Interval: 5
- Reformatting Operation Initial View Direction: "CORONAL"
- Display Set Patient Orientation: "L\F"
- VOI Type: BRAIN
- Item 19: [CT new ~~axial~~ transverse]
- Display Set Number: 19
- Display Set Presentation Group: 4
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [upper right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 1024/2560), (1024/3072, 512/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL_TRANSVERSE~~"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"

- Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"
- Item 20: [CT old ~~axial-transverse~~]
- Display Set Number: 20
- Display Set Presentation Group: 4
- Image Set Number: 3
- Image Boxes Sequence:
 - Item 1: [lower right quadrant of 1024x1024]
 - Image Box Number: 1
 - Display Environment Spatial Position: (512/3072, 512/2560), (1024/3072, 0/2560)
 - Image Box Layout Type: "STACK"
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL-TRANSVERSE~~"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"
- Item 21: [CT new two part scrolled, rows 1 & 3]
- Display Set Number: 21
- Display Set Presentation Group: 4
- Image Set Number: 2
- Image Boxes Sequence:
 - Item 1: [row 1 (top row) of 2048x2560 space]
 - Image Box Number: 1
 - Display Environment Spatial Position: (1024/3072, 2048/2560), (3072/3072, 1536/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"
 - Image Box Small Scroll Type: "IMAGE"
 - Image Box Small Scroll Amount: 1
 - Image Box Large Scroll Type: "ROW_COLUMN"
 - Image Box Large Scroll Amount: 1
 - Item 2: [row 3 of 2048x2560 space]
 - Image Box Number: 2
 - Display Environment Spatial Position: (1024/3072, 1024/2560), (3072/3072, 512/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"
 - Image Box Small Scroll Type: "IMAGE"

- Image Box Small Scroll Amount: 1
- Image Box Large Scroll Type: "ROW_COLUMN"
- Image Box Large Scroll Amount: 1
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:
 - Item 1:
 - Sort-by Category: "ALONG_AXIS"
 - Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\^P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"
- Item 22: [CT old two part scrolled, rows 2 & 4]
- Display Set Number: 22
- Display Set Presentation Group: 4
- Image Set Number: 3
- Image Boxes Sequence:
 - Item 1: [row 2 of 2048x2560 space]
 - Image Box Number: 1
 - Display Environment Spatial Position: (1024/3072, 1536/2560), (3072/3072, 1024/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"
 - Image Box Small Scroll Type: "IMAGE"
 - Image Box Small Scroll Amount: 1
 - Image Box Large Scroll Type: "ROW_COLUMN"
 - Image Box Large Scroll Amount: 1
 - Item 2: [row 4 (bottom row) of 2048x2560 space]
 - Image Box Number: 2
 - Display Environment Spatial Position: (1024/3072, 512/2560), (3072/3072, 0/2560)
 - Image Box Layout Type: "TILED"
 - Image Box Tile Horizontal Dimension: 3
 - Image Box Tile Vertical Dimension: 1
 - Image Box Scroll Direction: "HORIZONTAL"
 - Image Box Small Scroll Type: "IMAGE"
 - Image Box Small Scroll Amount: 1
 - Image Box Large Scroll Type: "ROW_COLUMN"
 - Image Box Large Scroll Amount: 1
- Filter Operations Sequence:
 - Item 1:
 - Filter-by Category: "IMAGE_PLANE"
 - Selector Attribute VR: "CS"
 - Selector CS Value: "~~AXIAL~~TRANSVERSE"
 - Filter-by Operator: "MEMBER_OF"
- Sorting Operations Sequence:

Use transverse not axial for cross-sectional images

Draft Final Text

- Item 1:
- Sort-by Category: "ALONG_AXIS"
- Sorting Direction: "INCREASING"
- Display Set Patient Orientation: "L\P"
- VOI Type: BRAIN
- Show Graphic Annotation Flag: "YES"

Partial Data Display Handling: "MAINTAIN_LAYOUT"

[Link up (synchronize) the MR and CT tiled scroll panes in Display Sets 15 and 16, and the CT new and CT old tiled scroll panes in Display Sets 21 and 22]

Synchronized Scrolling Sequence:

- Item 1:
- Display Set Scrolling Group: 15\16
- Item 2:
- Display Set Scrolling Group: 21\22