Correction Number CP-1469
Log Summary: Remove duplicate rows referencing source image or series for segmentation in volumetric ROI
Name of Standard
PS3.16

CP 1112 introduced volumetric ROIs that are defined by reference to either images with 2D coordinates, rasterized segmentations or surfaces defined by 3D coordinates. In early drafts, references to source images or series for segmentation were nested within parent content items for the different types, but when these were raised up one level of nesting to prevent forbidden content item relationships, it was not noticed that they were duplicated.

The duplicated references can be removed, since the different types of ROI are mutually exclusive.

Correction Wording:
Amend DICOM PS3.16 as follows (changes to existing text are bold and underlined for additions and struckthrough for removals):

**TID 1411 Volumetric ROI Measurements**

This Template provides a general structure to report one or more measurements for some metric, e.g., density, flow, or concentration, over a volumetric region of interest in a set of images or a Frame of Reference. The volumetric ROI may be specified by a set of SCOORDs on an image set representing a volume, by a volumetric Segmentation Image, by a volume defined in a Surface Segmentation, or by a SCOORD3D.

**Table TID 1411. Parameters**

<table>
<thead>
<tr>
<th>$Measurement</th>
<th>Coded term or Context Group for Concept Name of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Units</td>
<td>Units for the measurement</td>
</tr>
<tr>
<td>$ModType</td>
<td>Modifier Name for Concept Name of measurement</td>
</tr>
<tr>
<td>$ModValue</td>
<td>Modifier Value for Concept Name of measurement</td>
</tr>
<tr>
<td>$Method</td>
<td>Value for Measurement Method</td>
</tr>
<tr>
<td>$Derivation</td>
<td>Value for Measurement Derivation</td>
</tr>
<tr>
<td>$TargetSite</td>
<td>Value for Anatomic Location of measurement</td>
</tr>
<tr>
<td>$TargetSiteMod</td>
<td>Modifier Value for Anatomic Location of measurement</td>
</tr>
<tr>
<td>$Equation</td>
<td>Coded term or Context Group for the equation or table from which the measurement was derived or computed</td>
</tr>
<tr>
<td>$RefAuthority</td>
<td>Bibliographic reference or authority for statistical properties of a reference population</td>
</tr>
<tr>
<td>$RangeAuthority</td>
<td>Bibliographic reference or authority for the normal range of the measurement</td>
</tr>
<tr>
<td>$DerivationParameter</td>
<td>Coded term or Context Group for Concept Name of a derivation parameter</td>
</tr>
<tr>
<td>$DerivationParameterUnits</td>
<td>Units of derivation parameter</td>
</tr>
<tr>
<td>$QualitativeEvaluations</td>
<td>Evaluations encoded with code or text responses</td>
</tr>
</tbody>
</table>

**Table TID 1411. Volumetric ROI Measurements**

<table>
<thead>
<tr>
<th>NL</th>
<th>Rel with Parent</th>
<th>VT</th>
<th>Concept Name</th>
<th>VM</th>
<th>Req Type</th>
<th>Condition</th>
<th>Value Set Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>CONTAINER</td>
<td>EV (125007, DCM, &quot;Measurement Group&quot;)</td>
<td>1</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>&gt;</td>
<td>HAS OBS CONTEXT</td>
<td>TEXT</td>
<td>DT (112039, DCM, &quot;Tracking Identifier&quot;)</td>
<td>1</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>&gt;</td>
<td>HAS OBS CONTEXT</td>
<td>UIDREF</td>
<td>EV (112040, DCM, &quot;Tracking Unique Identifier&quot;)</td>
<td>1</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>&gt;</td>
<td>CONTAINS INCLUDE</td>
<td>D???</td>
<td>1</td>
<td>U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>&gt;</td>
<td>CONTAINS SCOORD</td>
<td>EV (111030, DCM, &quot;Image Region&quot;)</td>
<td>1-n</td>
<td>MC</td>
<td>XOR Rows 7, 10</td>
<td>GRAPHIC TYPE = not {MULTIPOINT}</td>
</tr>
<tr>
<td>6</td>
<td>&gt;&gt;</td>
<td>SELECTED FROM IMAGE</td>
<td>1</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>&gt;</td>
<td>CONTAINS IMAGE</td>
<td>EV (121191, DCM, &quot;Referenced Segment&quot;)</td>
<td>1</td>
<td>MC</td>
<td>XOR Rows 5, 10</td>
<td>Reference shall be to a Segmentation Image or Surface Segmentation object, with a single value specified in Referenced Segment Number</td>
</tr>
<tr>
<td>NL</td>
<td>Rel with Parent</td>
<td>VT</td>
<td>Concept Name</td>
<td>VM</td>
<td>Req Type</td>
<td>Condition</td>
<td>Value Set Constraint</td>
</tr>
<tr>
<td>----</td>
<td>----------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------</td>
<td>----</td>
<td>----------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>&gt;</td>
<td>IMAGE</td>
<td>EV (121233, DCM, &quot;Source image for segmentation&quot;)</td>
<td>1-n</td>
<td>MG</td>
<td>XOR Row 9</td>
<td>and IFF Row 7</td>
</tr>
<tr>
<td>9</td>
<td>&gt;</td>
<td>UIDREF</td>
<td>EV (121232, DCM, &quot;Source series for image segmentation&quot;)</td>
<td>1</td>
<td>MG</td>
<td>XOR Row 8</td>
<td>and IFF Row 7</td>
</tr>
<tr>
<td>10</td>
<td>&gt;</td>
<td>SCOORD3D</td>
<td>EV (121231, DCM, &quot;Volume Surface&quot;)</td>
<td>1</td>
<td>MC</td>
<td>XOR Rows 5, 7</td>
<td>GRAPHIC TYPE = {ELLIPSOID}</td>
</tr>
<tr>
<td>11</td>
<td>&gt;</td>
<td>IMAGE</td>
<td>EV (121233, DCM, &quot;Source image for segmentation&quot;)</td>
<td>1-n</td>
<td>MC</td>
<td>XOR Row 12</td>
<td>and IFF (Row 10 or Row 7)</td>
</tr>
<tr>
<td>12</td>
<td>&gt;</td>
<td>UIDREF</td>
<td>EV (121232, DCM, &quot;Source series for segmentation&quot;)</td>
<td>1</td>
<td>MC</td>
<td>XOR Row 11</td>
<td>and IFF (Row 10 or Row 7)</td>
</tr>
<tr>
<td>13</td>
<td>&gt;</td>
<td>IMAGE</td>
<td>EV (121200, DCM, &quot;Illustration of ROI&quot;)</td>
<td>1-n</td>
<td>U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>&gt;</td>
<td>COMPOSITE</td>
<td>EV (126100, DCM, &quot;Real World Value Map used for measurement&quot;)</td>
<td>1</td>
<td>U</td>
<td></td>
<td>SOP Class UID shall be Real World Value Mapping Storage (&quot;1.2.840.10008.5.1.4.1.1.67&quot;)</td>
</tr>
<tr>
<td>15</td>
<td>&gt;</td>
<td>INCLUDE</td>
<td>D???</td>
<td>1</td>
<td>M</td>
<td></td>
<td>$Measurement = $Measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Units = $Units</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ModType = $ModType</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$ModValue = $ModValue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Method = $Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Derivation = $Derivation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$TargetSite = $TargetSite</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$TargetSiteMod = $TargetSiteMod</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Equation = $Equation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$RefAuthority = $RefAuthority</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$RangeAuthority = $RangeAuthority</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$DerivationParameter = $DerivationParameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$DerivationParameterUnits = $DerivationParameterUnits</td>
</tr>
<tr>
<td>16</td>
<td>&gt;</td>
<td>CODE</td>
<td>$QualitativeEvaluations</td>
<td>1-n</td>
<td>U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>&gt;</td>
<td>TEXT</td>
<td>$QualitativeEvaluations</td>
<td>1-n</td>
<td>U</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Content Item Descriptions
| 1 | The Tracking Identifier and Tracking Unique Identifier are defined as a text label or unique identifier (respectively) used for tracking a finding or feature, potentially across multiple reporting objects, over time. As such, they are distinct from the Observation UID (0040,A171), which is unique identifier of the specific Content Item and its subsidiary Content Items that constitute an individual observation, and would be different for different observations on different occasions of the same finding or feature. |
| 2 | Rows 2, 3 |
| 3 | Referenced Segment Number (0062,000B) is an attribute of the IMAGE Content Item, and shall be present with a single value. |
| 4 | If the Referenced SOP Instance is a Segmentation Image, it shall have a defined Frame of Reference. If it has Segmentation Type (0062,0001) value BINARY, it identifies the volume of defined (measured) region of interest by voxel values in the referenced segment with value 1. If it has Segmentation Type value FRACTIONAL, the volume is defined by an implementation dependent method. |
| 5 | If the referenced SOP Instance is a Surface Segmentation, the referenced segment shall constitute a finite volume. It identifies the volume of the defined (measured) region of interest by the interior of the finite volume. Segment number shall be specified even if the Segmentation SOP Instance has only a single segment. |
| 6 | Rows 6, 7 |
| 7 | Identifies the source images that were segmented to identify the ROI, when, for example a subset of images in a series was used. |
| 8 | Rows 8, 11 |
| 9 | These referenced images may contain "screen shot" illustrating rendered versions of the ROI. |
| 10 | Row 13 |
| 11 | The reference to an RWV in Row 14 allows measurements to be made in units that differ from the stored pixel values in the images referenced elsewhere in the template. E.g., for a PET SUVbw measurement, the mapping from activity/concentration units in the referenced image that was used (and which may be reused for measurements in the future) may be encoded in a referenced RWV instance. This reference applies to any measurements in included templates, unless overridden. |
| 12 | Row 14 |
| 13 | Allows encoding a flat list of name-value pairs that are coded questions with coded or text answers, for example, to record categorical observations related to the subject of the measurement group. |
| 14 | Rows 16, 17 |