

2017/03/03

The following changes have been made relative to the previously published PS3 2016e release of the standard, by incorporating the changes specified in the supplements and correction items.

The Final Text of all applied Supplements and Correction Proposals is available at <ftp://medical.nema.org/medical/dicom/final/>

## Production Notes

The DocBook XML files are the source format, and all other formats are rendered from it.

The PDF format is rendered from the DocBook XML, and remains the "official" (authoritative) form of the standard. The PDF contains hyperlinks to sections, figures and tables both within and between parts (which in the latter case work if you are reading the PDF in a tool that supports linking to other parts).

The two HTML formats are provided for the convenience of those who find them easier to navigate within a browser, and though the appearance and organization is different, the content is the same. One form consists of entire parts in one very large HTML page, and the other consist of chunks of sections with navigation elements. Both forms are hyper-linked within and between parts. The figures in the HTML are SVG, so a browser that supports SVG is required (most contemporary browsers do).

All paragraphs (<p/> elements) in the HTML files of this release, are uniquely identified with a hypertext anchor (<a/> element), each of which has an id attribute (derived from the source DocBook <para/> element xml:id attribute). These unique identifiers will remain stable in subsequent releases, so they may be reliably used as the persistent targets of hyperlinks relative to the current release base URL, and are more specific than the existing anchors for entire sections or tables. Unlike the section and table anchors, there is no semantic significance to the syntax of the identifiers (i.e., they are UUIDs, rather than being derived from the section or table numbering pattern). Subsequent releases will add new identifiers for new paragraphs and text split out of existing paragraphs into new paragraphs, and will, if possible, empty, rather than entirely remove, existing paragraphs that are retired (in order to avoid dead links).

The DOCX (for Word) and ODT (for OpenOffice or LibreOffice) formats are provided for the convenience of future Supplement and CP editors. Their main claim to fame is that they exist at all, and though they are viewable and editable, they are lacking many features of the Word source of previous release, for example the use of styles for section headings. They do contain embedded hyperlinks, and these are also present in the table of contents, even though the page numbers rendered in the table of contents may be meaningless. To reiterate, the intent of these files is to provide a source to cut and past into new Word documents, and not to be functional documents in their own right. Since Word does not support SVG, all figures embedded in the DOCX files have been rasterized to a fixed resolution and are adequate for position only and are not editable and are not intended to be a substitute for the SVG figures.

The rendering pipeline used to produce these files is available but requires some expertise to use it. It is not supported. To achieve quality rendering, the use of some commercial tools was necessary, to supplement the many open source tools that were also used. Oxygen (commercial) was used as the XML editor since it supports a WYSIWG authoring mode. OpenOffice (open source) was used as the equation editor. The DocBook (open source, version docbook-xsl-ns-1.78.1) style sheets were used to create the HTML and intermediate FO form used to create the PDF and DOCX. MathML equations were converted to SVG using pMML2SVG (open source, version pMML2SVG-0.8.5). RenderX XEP (commercial) was used to produce the PDF, and XMLmind FO-Converter (commercial) was used to produce the DOCX. The difference files were produced using DeltaXML DocBook Compare (commercial). The PDF files were post-processed with qpdf to generate object streams to reduce the size of the tagged PDF and improve searching for strings that span lines within tables and to linearize the files for streamed web page viewing.

Some characteristics of the DocBook XML may be of interest to those performing automated processing or extraction:

- Zero width spaces (U+200B) are used in some places to allow long words (such as PS3.6 keywords and UIDs) to break within table columns and avoid tables becoming too wide to fit on a page. These need to be filtered out before using these words literally.
- Enumerated values and defined terms are formalized in PS3.3 as DocBook variablelist elements with a title identifying them as such, to facilitate their automated detection and extraction.
- Template and context group tables in PS 3.16 are preceded by variablelist elements defining whether or not they are extensible, etc., again to enable automated extraction.
- Hyperlinks (xref and link elements) are used extensively but may obscure the identifier of what is being linked to from the perspective of automated extraction. It may be useful to consult the olink targetdb files that are included in the package to "look up" the target of such links, rather than reinventing this mechanism, which is used by the DocBook stylesheets for cross-document linking. E.g.,

one can look up "sect\_TID\_300" in "output/html/targetdb/PS3\_16\_target.db" to determine that it has a "number" of "TID 300" and a "ttl" of "Measurement", etc.

## Changes to Parts

### General Changes

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#### PS3.1

- CP 1620

#### PS3.2

- Correct I.4.2.2.2 section heading.
- Hyperlink code sequence tuples to internal or external definitions.

#### PS3.3

- Correct VR of View Orientation Modifier, Component Type Code Sequence to SQ and name of View Orientation Modifier Code Sequence (were wrong in Sup 131).
- Hyperlink code sequence tuples to internal or external definitions.
- Add notes about long and equivalent codes used in examples not being in SNOMED subset and/or INT release.
- Add Horizontal Field of View back in to Ophthalmic Photography Acquisition Parameters Module (was incorrectly omitted in 2011 when factoring out Ophthalmic Acquisition Parameters Macro per Sup 110).
- Make name of (0018,1272) consistent with PS3.6 by including "Calculation"
- Change order of some lists of Enumerated Values to work around defect in XFC Word/ODT renderer that causes auto-detection as numbered list that changes the numeric values (e.g., 1, 0 or 1, 3 changes to 1, 2 in Word output)
- Change all uses of "sent" to be more specific, e.g., "present" in conditions, "encoded" for values, "transmitted" or "delivered" where appropriate.
- Correctly nest attributes within Stored Value Color Range Sequence
- Include LINEAR\_EXACT in Defined Terms as should have been done for CP 1264
- Correct indentation of invoked Code Sequence Macro for Transformation Method Code Sequence in Table C.8.17.12-1.
- Correct indentation of invoked Person Identification Macro for Intended Recipients of Results Identification Sequence in Table C.4-11.
- Correct included macro to Table C.7.1.4-1 in Table C.2-2 per CP 1457.
- CP 1455 and factor out IEC 60601-2-63 as reference
- CP 1600
- CP 1619

#### PS3.4

- Hyperlink code sequence tuples to internal or external definitions.

**PS3.5**

- Make use of image versus video compression consistent in section titles and text.
- CP 1624

**PS3.6**

- Correct VR of View Orientation Modifier, Component Type Code Sequence to SQ and name of View Orientation Modifier Code Sequence (were wrong in Sup 131).
- CP 1619

**PS3.7**

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**PS3.8**

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**PS3.10**

- Clean up attribute names and abbreviations in example Table A.1-1.

**PS3.11**

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**PS3.12**

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**PS3.14**

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**PS3.15**

- Hyperlink code sequence tuples to internal or external definitions.
- CP 1641

**PS3.16**

- Remove page numbers from DCM code references in echo context groups.
- Use shorter code meaning in note in CID 616 Anesthesia Maintenance Code Type to match table.
- Add UMLS codes to CID 3724 Smoking History and hyperlinks to external lexicons.
- Hyperlink code sequence tuples to internal or external definitions.
- Change UMLS mapping for (T-D8000, SRT, "Upper limb") from C0016555 "Forelimb" to C1140618 "Upper Extremity"
- Change UMLS mapping for (T-D9200, SRT, "Knee") from C1456798 "Stiffle joint" to C0022742 "Knee"
- Correct code meaning for UCUM dynes to dyn.
- Correct reference to TID 5204 Wall Motion Analysis in Figure A-10b.

- CP 1619
- CP 1621

### **PS3.17**

- Correct order of code value and scheme in examples.
- Hyperlink code sequence tuples to internal or external definitions.

### **PS3.18**

- Sup 194

### **PS3.19**

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### **PS3.20**

- Hyperlink code sequence tuples to internal or external definitions.

## **Supplements Incorporated**

**Sup 194** RESTful Non-Patient Instance Storage

## **Correction Items Incorporated**

- CP 1455** Add Dose Area Product to CT Image IOD
- CP 1600** Clarify Graphic Annotation in Volumetric Presentation States
- CP 1619** Add source mouse strain and genetic modifications for homograft to exogenous substances, and add allele to patient
- CP 1620** Clarify that conformance reference requirements do not serve in lieu of a form conformance statement
- CP 1621** Add more exogenous substance administration sites
- CP 1622** Add caDSR coding scheme
- CP 1624** Convention for reference to Private Data Elements
- CP 1641** ParticipantObjectContainsStudy shall not be mandatory in DICOM audit message