Exclusively foot & ankle

Paragon 28®

SMART PCFD℠ 1.0

DICOM CONFORMANCE STATEMENT

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1 Introduction

1.1 Purpose

The purpose of this document is to facilitate integration between SMART PCFD℠ and other applications by defining the DICOM attributes needed by the service. The reader of this document should have an in-depth understanding of the DICOM standard.

1.2 Scope

This document is limited to the specifications associated with SMART PCFD℠ case creation.

1.3 References

- NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA

1.4 Abbreviations

Abbreviation	Definition
CS	Code string
CT	Computed tomography
DS	Decimal string
IS	Integer string
OB	Other byte
OW	Other word
UID	Unique identifier
SOP	Service object pair
UI	User interface
VR	Value representation

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2 Modules

SMART PCFD℠ supports the standard SOP classes for CT Image Storage and Enhanced CT Image Storage. This chapter identifies the modules and attributes which are accessed during case creation. All other modules and attributes, even if listed as mandatory by the DICOM standard, are unused by the service.

Caution: The medical image modality intended to be used in the software is weight-bearing CT (WBCT). Use of non-weight-bearing medical imaging as an input for the software is prohibited.

Caution: In case of poor image contrast, low resolution, inadequate Field-of-View, artefacts (e.g. from metallic structures in the image), or other image related defects or inaccuracies, the results can be inaccurate.

2.1 SOP Common

Name	Tag	Type	VR	Requirements/Usage
SOP Class UID	(0008,0016)	1	UI	The value must be one of the following: - 1.2.840.10008.5.1.4.1.1.2 (CT Image Storage) - 1.2.840.10008.5.1.4.1.1.2.1 (Enhanced CT Image Storage)

2.2 General Image

This module applies only to CT Image Storage.

Name	Tag	Type	VR	Requirements/Usage
Image Type	(0008,0008)	1	CS	The value of the attribute must be: - ['ORIGINAL', 'PRIMARY', 'AXIAL']
Instance Number	(0020,0013)	2	IS	A number that identifies this image. Each input image must have a sequential unique instance number.

2.3 General Series

Name	Tag	Type	VR	Requirements/Usage
Modality	(0008,0060)	1	CS	The value of the attribute must be “CT”.
Series Instance UID	(0020,000E)	1	UI	All input DICOMs for a case must have the same UID.

2.4 General Study

Name	Tag	Type	VR	Requirements/Usage
Study Instance UID	(0020,000D)	1	UI	All input DICOMs for a case must have the same UID.

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2.5 Image Pixel

Name	Tag	Type	VR	Requirements/Usage
Photometric Interpretation	(0028,0004)	1	CS	Specifies the intended interpretation of the pixel data.
Rows	(0028,0010)	1	US	Number of rows in the image.
Columns	(0028,0011)	1	US	Number of columns in the image.
Bits Allocated	(0028,0100)	1	US	Number of bits allocated for each pixel sample. The value must be 16.
High Bit	(0028,0102)	1	US	Most significant bit for pixel sample data.
Pixel Data	(7FE0,0010)	1	OB or OW	A data stream of the pixel samples that comprise the Image. The order of pixels encoded for each image plane is left to right, top to bottom, i.e., the upper left pixel (labeled 1,1) is encoded first followed by the remainder of row 1, followed by the first pixel of row 2 (labeled 2,1) then the remainder of row 2 and so on.

2.6 Image Plane

Name	Tag	Type	VR	Requirements/Usage
Slice Thickness	(0018,0050)	2	DS	The value of attribute must be between 0.3 mm to 0.6 mm (inclusive).
Pixel Spacing	(0028,0030)	1	DS	Both values of the numeric pair must be between 0.3 mm to 0.6 mm (inclusive).
Image Position	(0020,0032)	1	DS	The x, y, and z coordinates of the upper left-hand corner (center of the first voxel transmitted) of the image, in mm.
Image Orientation	(0020,0037)	1	DS	The direction cosines of the first row and the first column with respect to the patient.

2.7 CT Image

This module applies only to CT Image Storage.

Name	Tag	Type	VR	Requirements/Usage
Rescale Intercept	(0028,1052)	1	DS	The value b in relationship between stored values (SV) and the output units. Output units = m*SV+b
Rescale Slope	(0028,1053)	1	DS	The value m in relationship between stored values (SV) and the output units. Output units = m*SV+b

2.8 Enhanced CT Image

This module applies only to Enhanced CT Image Storage.

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Name	Tag	Type	VR	Requirements/Usage
Image Type	(0008,0008)	1	CS	The value of the attribute must be: - ['ORIGINAL', 'PRIMARY']

2.9 Multi-Frame Functional Groups

This module applies only to Enhanced CT Image Storage.

Name	Tag	Type	VR	Requirements/Usage
Number of Frames	(0028,0008)	1	IS	Number of frames in a multi-frame image. The attribute applies only to Enhanced CT Image Storage.

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3 Other Requirements

3.1 Image Dimensions

The maximum dimensions of the weight-bearing CT scan are 450 mm x 450 mm x 450 mm which means that the maximum number of voxels per dimension at the smallest voxel size is 1500.

3.2 Field of View

SMART PCFD℠ supports both bilateral and unilateral weight-bearing CTs. For the analyzed foot, the Field of View (FOV) must contain all bones of the foot from hindfoot (posterior tuberosity of the Calcaneus) to the toes (distal ends of all Proximal Phalanges). The Tibia must be contained at least 100 mm and less than 300 mm proximally from the tibial plafond.

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