

Digital Imaging and Communications in Medicine (DICOM)

Supplement 92:

Media Application Profile for Digital Radiographic Images in Dentistry

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DICOM WG 22 - ADA SCDI WG 12.1

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Part 11 Additions

Annex X Dental Application Profile (Normative)

X.1 CLASS AND PROFILE IDENTIFICATION

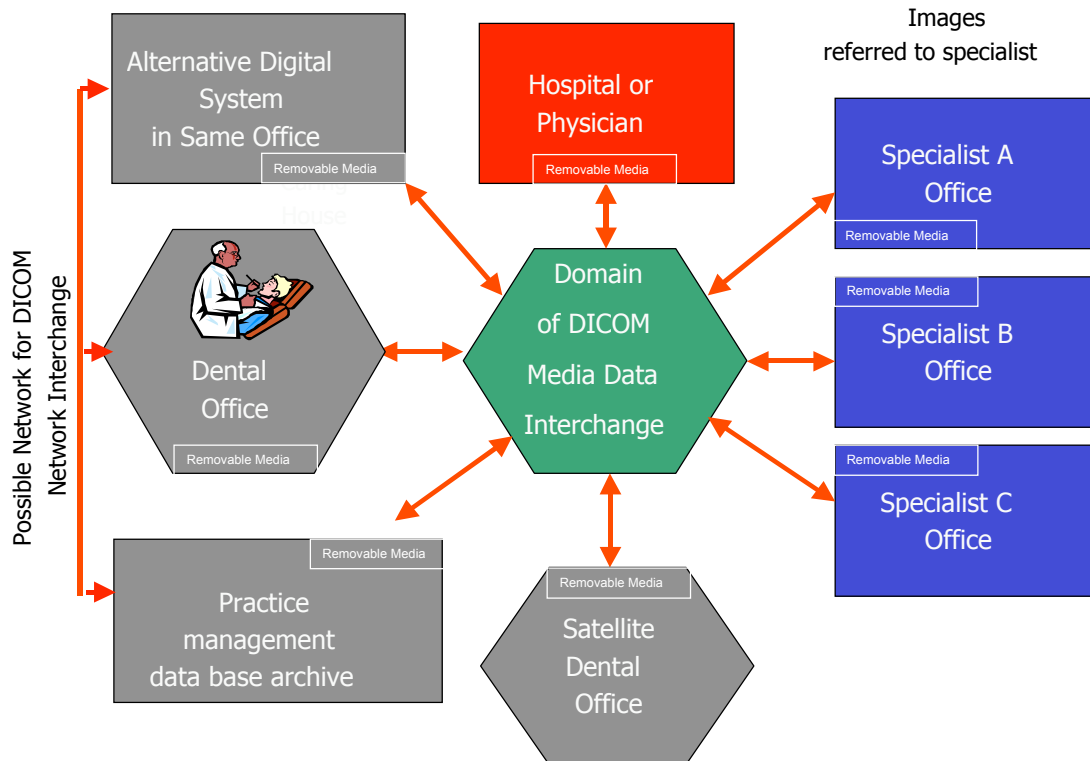
This Annex defines Application Profiles for Dental Media Storage applications.

Table X.1-1
APPLICATION PROFILE IDENTIFIERS

Application Profile	Identifier	Description
Dental Radiograph Interchange	STD-DEN-CD	Interchange of dental radiographic images on CD

X.2 CLINICAL CONTEXT

This Application Profile facilitates the interchange of dental data on media. Typical interchanges would be between dental systems, between a dental system and a display workstation, between display



workstations, or between a dental system and a data archive. This context is shown in Figure X.2-1.

**Figure X.2-1
 CLINICAL CONTEXT**

The operational use of the media transfer is potentially between private practitioners and an institution, intra-institutional and inter-institutional.

X.2.1 Roles

X.2.1.1 FILE SET CREATOR

The role of File Set Creator shall be used by Application Entities that generate a File Set under the STD-DEN-CD Application Profile. Typical entities using this role would include dental imaging equipment, workstations, and archive systems that generate a patient record for transfer. File Set Creators shall be

able to generate the Basic Directory SOP Class Instance in the DICOMDIR file and Digital Intra-oral X-Ray and Digital X-Ray Image Storage SOP Class Instances in the File Set.

An FSC shall offer the ability to either finalize the disc at the completion of the most recent write session (no additional information can be subsequently added to the disc) or to allow multi-session (additional information may be subsequently added to the disc).

Note: A multiple volume (a logical volume that can cross multiple physical media) is not supported by this Application Profile Class. If a set of Files, e.g., a Study, cannot be written entirely on one CD-R, the FSC will create multiple independent DICOM File-sets such that each File-set can reside on a single CD-R media controlled by its individual DICOMDIR file. The user of the FSC can opt to use written labels on the discs to indicate that there is more than one disc for this set of files (e.g., a study).

X.2.1.2 FILE SET READER

The role of File Set Reader shall be used by Application Entities that receive a transferred File Set. Typical entities using this role would include dental systems, display workstations, and archive systems that receive a patient record from a piece of media. File Set Readers shall be able to read the DICOMDIR directory file and all SOP Class Instances defined for this Application Profile, using the defined Transfer Syntaxes.

X.2.1.3 FILE SET UPDATER

The role of File Set Updater is not supported by this profile.

X.3 GENERAL CLASS PROFILE

X.3.1 SOP Classes and Transfer Syntaxes

The Application Profile STD-DEN-CD shall support the SOP Classes and Transfer Syntaxes in the following table.

**Table X.3-1
ABSTRACT AND TRANSFER SYNTAXES**

Information Object Definition	SOP Class UID	Transfer Syntax and UID	FSC Requirement	FSR Requirement
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Mandatory	Mandatory
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Optional	Mandatory
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Optional	Mandatory

Note: The Digital X-Ray Image Storage and Digital Intra-oral X-Ray Image Storage For Presentation SOP Classes can also be used for scanned film.

A File Set Creator (FSC) shall support at least one of the specified image storage SOP Classes.

X.3.2 Physical media and media formats

The STD-DEN-CD profile requires the 120 mm CD-R physical media with the ISO/IEC 9660 Media Format, as defined in PS 3.12.

X.3.3 Directory information in DICOMDIR

Conformant Application Entities shall include in the DICOMDIR File the Basic Directory IOD containing Directory Records at the Patient and the subsidiary Study and Series levels, appropriate to the SOP Classes in the File Set.

All DICOM files in the File Set incorporating SOP Instances defined for the specific Application Profile shall be referenced by Directory Records.

Note: DICOMDIRs with no directory information are not allowed by this Application Profile.

All implementations shall include the DICOM Media Storage Directory in the DICOMDIR file. There shall only be one DICOMDIR file per File Set. The DICOMDIR file shall be in the root directory of the medium. The Patient ID at the patient level shall be unique for each patient directory record in one File Set.

No additional DICOMDIR keys are specified for this profile.

X.3.4 Other Parameters

X.3.4.1 IMAGE ATTRIBUTE VALUES

The Attributes listed in Table X.3-3 used within the image files shall take the values specified.

**Table X.3-3
STD-DEN-CD - REQUIRED IMAGE ATTRIBUTE VALUES**

Attribute	Tag	Value
Bits Allocated	(0028,0100)	If Bits Stored (0028,0101) is 8, then 8; otherwise 16.
Bits Stored	(0028,0101)	8, 10, 12 or 16

X.3.4.2 IMAGE ATTRIBUTE SPECIALIZATION

The Attributes listed in Table X.3-4 shall have their Types specialized.

**Table X.3-4
STD-DEN-CD - REQUIRED IMAGE ATTRIBUTE TYPES**

Attribute	Tag	Type
Institution Name	(0008,0080)	2
Manufacturer's Model Name	(0008,1090)	2
Detector ID	(0018,700A)	2

Detector Manufacturer Name	(0018,702A)	2
Detector Manufacturer's Model Name	(0018,702B)	2

Note: These Type 3 attributes of the General Equipment and DX Detector Module are specialized in order to encourage FSC's to include values for them, recognizing that there are situations in which values may be unknown.

Part 3 Additions

Modify PS3.3 Table C.8-71 DX DETECTOR MODULE ATTRIBUTES to add 2 new elements

Attribute Name	Tag	Type	Attribute Description
Detector Manufacturer Name	(0018,702A)	3	Name of the manufacturer of the detector component of the acquisition system
Detector Manufacturer's Model Name	(0018,702B)	3	Model name of the detector component of the acquisition system

Part 6 Additions

Add to PS3.6

Tag	Name	VR	VM
(0018,702A)	Detector Manufacturer Name	LO	1
(0018,702B)	Detector Manufacturer's Model Name	LO	1