DICOM Reference Handbook

![OTech logo]

Welcome!

Welcome to the world of DICOM (Digital Imaging and Communications in Medicine) and HL7 (Health Level Seven). The DICOM standard§ supports integration of the servers, workstations, scanners, printers and other components that comprise a PACS (Picture Archiving and Communication System). With DICOM, devices from different manufacturers can exchange medical images and image-related information reliably. The HL7 standard covers most of the non-image related information exchange in a healthcare environment.

Intended audience
This guide is intended for department administrators, PACS administrators, and students. It provides excerpts from the most frequently referenced parts of the DICOM and HL7 standard.

How NOT to use this reference guide
This reference guide provides a snapshot of DICOM and HL7. Because the DICOM and HL7 standards are continuously expanding and improving, this guide should be used as a reference only. Implementers, system integrators, and troubleshooters should always check the latest version of the standard available at http://medical.nema.org/ and www.hl7.org .

Additional resources
Additional information about DICOM can be found in the *DICOM Basics* textbook and HL7 Messaging textbook, both available at www.otechimg.com.

DICOM and HL7 training and certification
Thousands of professionals have received DICOM and HL7 training. Many training methods are available including self-study using textbooks and study guides, computer-based training, online training, and face-to-face training.

What's next?
I hope this guide will be of use to you. All feedback is welcomed; please contact me at info@otechimg.com, if you have any suggestions or questions.

Herman Oosterwijk

DICOM standard Reference Tables

This guide contains the following tables, which are excerpted from the DICOM Standard.

- Defined terms for Modality
- Commonly-used DICOM Data Elements
- Value Representations
- Frequently-Encountered UIDs

Because new supplements and corrections to the DICOM standard are published continuously, the full standard at http://medical.nema.org/ should be checked before acting on the information presented in these tables.

Defined terms for Modality:

The Modality Type is widely used by the acquisition device to filter modality worklist queries. In DICOM, Modality Type is a "Defined Term" that can have additional values added as both the standard and imaging technology evolves. As of the publication of this document, the following Modality Type values are used in DICOM:

AR	Autorefraction	OP	Ophthalmic Photography
ASMT	Content Assessment Results	OPM	Ophthalmic Mapping
AU	Audio	OPT	Ophthalmic Tomography
BDUS	Bone Densitometry (ultrasound)	OPV	Ophthalmic Visual Field
BI	Biomagnetic imaging	OSS	Optical Surface Scan
BMD	Bone Densitometry (X-Ray)	OT	Other
CR	Computed Radiography	PLAN	Plan
CT	Computed Tomography	PR	Presentation State
DG	Diaphanography	PT	Positron emission tomography (PET)
DOC	Document	PX	Panoramic X-Ray
DX	Digital Radiography	REG	Registration
ECG	Electrocardiography	RESP	Respiratory Waveform
EPS	Cardiac Electrophysiology	RF	Radio Fluoroscopy
ES	Endoscopy	RG	Radiographic imaging (conv. film/screen)
FID	Fiducials	RTDOSE	Radiotherapy Dose
GM	General Microscopy	RTIMAGE	Radiotherapy Image
HC	Hard Copy	RTPLAN	Radiotherapy Plan
HD	Hemodynamic Waveform	RTRECORD	RT Treatment Record
IO	Intra-Oral Radiography	RTSTRUCT	Radiotherapy Structure Set
IOL	Intraocular Lens Data	RWV	Real World Value Map
IVOCT	IV Opt. Coherence Tomography	SEG	Segmentation
IVUS	Intravascular Ultrasound	SM	Slide Microscopy
KER	Keratometry	SMR	Stereometric Relationship
KO	Key Object Selection	SR	SR Document
LEN	Lensometry	SRF	Subjective Refraction
LS	Laser surface scan	STAIN	Automated Slide Stainer
MG	Mammography	TG	Thermography
MR	Magnetic Resonance	US	Ultrasound
NM	Nuclear Medicine	VA	Visual Acuity
OAM	Ophthalmic Axial Measurements	XA	X-Ray Angiography
OCT	Optical Coherence Tomography	XC	External-camera Photography

Commonly-encountered DICOM Attributes

The following table contains a partial list of DICOM Data Elements drawn form Part 6 of the DICOM standard. This table does not list all Data Elements; rather, it is limited to those elements that are typically present in DICOM image headers or in other imaging-related DICOM objects. Those Attributes, which have to be updated and/or changed frequently by an administrator to maintain data integrity, are highlighted as grey.

This table can be useful when "data mining" contents of a header. The first two columns in this table list the tag and name of each Data Element. The VR column lists the Value Representation for each Data Element (each VR is described in detail in the next section). The VM column indicates the Value Multiplicity§—how many values can be specified in a particular Data Element.

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0002,0000)	Group Length*	UL	1
(0002,0001)	File Meta Information Version*	OB	1
(0002,0002)	Media Storage SOP Class UID*	UI	1
(0002,0003)	Media Storage SOP Instance UID*	UI	1
(0002,0010)	Transfer Syntax UID*	UI	1
(0002,0012)	Implementation Class UID*	UI	1
(0002,0013)	Implementation Version Name*	SH	1
(0002,0016)	Source Application Entity Title*	AE	1
(0002,0100)	Private Information Creator UID*	UI	1
(0002,0102)	Private Information*	OB	1
(0008,0005)	Specific Character Set	CS	1-n
(0008,0008)	Image Type	CS	1-n
(0008,0012)	Instance Creation Date	DA	1
(0008,0013)	Instance Creation Time	TM	1
(0008,0014)	Instance Creator UID	UI	1
(0008,0016)	SOP Class UID	UI	1
(0008,0018)	SOP Instance UID	UI	1
(0008,0020)	Study Date	DA	1
(0008,0021)	Series Date	DA	1
(0008,0022)	Acquisition Date	DA	1
(0008,0023)	Content Date	DA	1
(0008,002A)	Acquisition Date/time	DT	1
(0008,0030)	Study Time	TM	1
(0008,0031)	Series Time	TM	1
(0008,0032)	Acquisition Time	TM	1
(0008,0033)	Content Time	TM	1

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* These Data Elements are generally only encountered in metafile header tags.

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0008,0050)	Accession Number	SH	1
(0008,0052)	Query/Retrieve Level	CS	1
(0008,0054)	Retrieve AE Title	AE	1-n
(0008,0056)	Instance Availability	CS	1
(0008,0060)	Modality	CS	1
(0008,0064)	Conversion Type	CS	1
(0008,0068)	Presentation Intent Type	CS	1
(0008,0070)	Manufacturer	LO	1
(0008,0080)	Institution Name	LO	1
(0008,0081)	Institution Address	ST	1
(0008,0090)	Referring Physician's Name	PN	1
(0008,0100)	Code Value	SH	1
(0008,0102)	Coding Scheme Designator	SH	1
(0008,0103)	Coding Scheme Version	SH	1
(0008,0104)	Code Meaning	LO	1
(0008,0105)	Mapping Resource	CS	1
(0008,0201)	Timezone Offset From UTC	SH	1
(0008,1010)	Station Name	SH	1
(0008,1030)	Study Description	LO	1
(0008,1032)	Procedure Code Sequence	SQ	1
(0008,103E)	Series Description	LO	1
(0008,1040)	Institutional Department Name	LO	1
(0008,1050)	Performing Physician's Name	PN	1-n
(0008,1084)	Admitting Diagnoses Code Sequence	SQ	1
(0008,1090)	Manufacturer's Model Name	LO	1
(0008,1110)	Referenced Study Sequence	SQ	1
(0008,1111)	Referenced Performed Procedure Step Sequence	SQ	1
(0008,1150)	Referenced SOP Class UID	UI	1
(0008,1155)	Referenced SOP Instance UID	UI	1
(0008,1195)	Transaction UID	UI	1
(0008,2111)	Derivation Description	ST	1
(0008,2112)	Source Image Sequence	SQ	1
(0008,2218)	Anatomic Region Sequence	SQ	1
(0008,2220)	Anatomic Region Modifier Sequence	SQ	1
(0008,2228)	Primary Anatomic Structure Sequence	SQ	1
(0008,2229)	Anatomic Structure, Space or Region Sequence	SQ	1
(0008,2230)	Primary Anatomic Structure Modifier Sequence	SQ	1
(0008,9460)	Skip Frame Range Flag	CS	1
(0010,0010)	Patient's Name	PN	1
(0010,0020)	Patient ID	LO	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0010,0021)	Issuer of Patient ID	LO	1
(0010,0030)	Patient's Birth Date	DA	1
(0010,0032)	Patient's Birth Time	TM	1
(0010,0040)	Patient's Sex	CS	1
(0010,1000)	Other Patient IDs	LO	1-n
(0010,1001)	Other Patient Names	PN	1-n
(0010,1010)	Patient's Age	AS	1
(0010,1020)	Patient's Size	DS	1
(0010,1030)	Patient's Weight	DS	1
(0010,2000)	Medical Alerts	LO	1-n
(0010,2110)	Contrast Allergies	LO	1-n
(0010,21B0)	Additional Patient History	LT	1
(0010,21C0)	Pregnancy Status	US	1
(0010,4000)	Patient Comments	LT	1
(0018,0010)	Contrast/Bolus Agent	LO	1
(0018,0012)	Contrast/Bolus Agent Sequence	SQ	1
(0018,0014)	Contrast/Bolus Administration Route Sequence	SQ	1
(0018,0015)	Body Part Examined	CS	1
(0018,0031)	Radiopharmaceutical	LO	1
(0018,0040)	Cine Rate	IS	1
(0018,0050)	Slice Thickness	DS	1
(0018,0060)	KVP	DS	1
(0018,1003)	Device ID	LO	1
(0018,1004)	Plate ID	LO	1
(0018,1005)	Generator ID	LO	1
(0018,1006)	Grid ID	LO	1
(0018,1007)	Cassette ID	LO	1
(0018,1008)	Gantry ID	LO	1
(0018,1010)	Secondary Capture Device ID	LO	1
(0018,1020)	Software Version(s)	LO	1-n
(0018,1030)	Protocol Name	LO	1
(0018,1040)	Contrast/Bolus Route	LO	1
(0018,1041)	Contrast/Bolus Volume	DS	1
(0018,1042)	Contrast/Bolus Start Time	TM	1
(0018,1043)	Contrast/Bolus Stop Time	TM	1
(0018,1044)	Contrast/Bolus Total Dose	DS	1
(0018,1100)	Reconstruction Diameter	DS	1
(0018,1110)	Distance Source to Detector	DS	1
(0018,1111)	Distance Source to Patient	DS	1
(0018,1114)	Estimated Radiographic Magnification Factor	DS	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0018,1120)	Gantry/Detector Tilt	DS	1
(0018,1121)	Gantry/Detector Slew	DS	1
(0018,1130)	Table Height	DS	1
(0018,1140)	Rotation Direction	CS	1
(0018,1150)	Exposure Time	IS	1
(0018,1151)	X-ray Tube Current	IS	1
(0018,1152)	Exposure	IS	1
(0018,115E)	Image and Fluoroscopy Area Dose Product	DS	1
(0018,1164)	Imager Pixel Spacing	DS	2
(0018,1182)	Focal Distance	IS	1-2
(0018,1190)	Focal Spot(s)	DS	1-n
(0018,1200)	Date of Last Calibration	DA	1-n
(0018,1201)	Time of Last Calibration	TM	1-n
(0018,1210)	Convolution Kernel	SH	1-n
(0018,1260)	Plate Type	SH	1
(0018,1261)	Phosphor Type	LO	1
(0018,1402)	Cassette Orientation	CS	1
(0018,1403)	Cassette Size	CS	1
(0018,1404)	Exposures on Plate	US	1
(0018,1405)	Relative X-ray Exposure	IS	1
(0018,3100)	IVUS Acquisition	CS	1
(0018,3101)	IVUS Pullback Rate	DS	1
(0018,3102)	IVUS Gated Rate	DS	1
(0018,3103)	IVUS Pullback Start Frame Number	IS	1
(0018,3104)	IVUS Pullback Stop Frame Number	IS	1
(0018,5000)	Output Power	SH	1-n
(0018,5010)	Transducer Data	LO	3
(0018,5012)	Focus Depth	DS	1
(0018,5020)	Processing Function	LO	1
(0018,5021)	Postprocessing Function	LO	1
(0018,5050)	Depth of Scan Field	IS	1
(0018,5100)	Patient Position	CS	1
(0018,5101)	View Position	CS	1
(0018,6000)	Sensitivity	DS	1
(0018,6011)	Sequence of Ultrasound Regions	SQ	1
(0018,6012)	Region Spatial Format	US	1
(0018,6014)	Region Data Type	US	1
(0018,6016)	Region Flags	UL	1
(0018,6018)	Region Location Min X_0	UL	1
(0018,601A)	Region Location Min Y_0	UL	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	Name	VR	VM
(0018,601C)	Region Location Max X_1	UL	1
(0018,601E)	Region Location Max Y_1	UL	1
(0018,6020)	Reference Pixel X_0	SL	1
(0018,6022)	Reference Pixel Y_0	SL	1
(0018,6024)	Physical Units X Direction	US	1
(0018,6026)	Physical Units Y Direction	US	1
(0018,6028)	Reference Pixel Physical Value X	FD	1
(0018,602A)	Reference Pixel Physical Value Y	FD	1
(0018,602C)	Physical Delta X	FD	1
(0018,602E)	Physical Delta Y	FD	1
(0018,6030)	Transducer Frequency	UL	1
(0018,6031)	Transducer Type	CS	1
(0018,6032)	Pulse Repetition Frequency	UL	1
(0018,6034)	Doppler Correction Angle	FD	1
(0018,6036)	Steering Angle	FD	1
(0020,000D)	Study Instance UID	UI	1
(0020,000E)	Series Instance UID	UI	1
(0020,0010)	Study ID	SH	1
(0020,0011)	Series Number	IS	1
(0020,0012)	Acquisition Number	IS	1
(0020,0013)	Instance Number	IS	1
(0020,0020)	Patient Orientation	CS	2
(0020,0032)	Image Position (Patient)	DS	3
(0020,0037)	Image Orientation (Patient)	DS	6
(0020,0052)	Frame of Reference UID	UI	1
(0020,0060)	Laterality	CS	1
(0020,0062)	Image Laterality	CS	1
(0020,0200)	Synchronization Frame of Reference UID	UI	1
(0020,1002)	Images in Acquisition	IS	1
(0020,1040)	Position Reference Indicator	LO	1
(0020,1041)	Slice Location	DS	1
(0020,1200)	Number of Patient Related Studies	IS	1
(0020,1202)	Number of Patient Related Series	IS	1
(0020,1204)	Number of Patient Related Instances	IS	1
(0020,1206)	Number of Study Related Series	IS	1
(0020,1208)	Number of Study Related Instances	IS	1
(0020,1209)	Number of Series Related Instances	IS	1
(0020,4000)	Image Comments	LT	1
(0020,9056)	Stack ID	SH	1
(0020,9057)	In-Stack Position Number	UL	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0028,0002)	Samples per Pixel	US	1
(0028,0003)	Samples per Pixel Used	US	1
(0028,0004)	Photometric Interpretation	CS	1
(0028,0006)	Planar Configuration	US	1
(0028,0008)	Number of Frames	IS	1
(0028,0009)	Frame Increment Pointer	AT	1-n
(0028,000A)	Frame Dimension Pointer	AT	1-n
(0028,0010)	Rows	US	1
(0028,0011)	Columns	US	1
(0028,0012)	Planes	US	1
(0028,0030)	Pixel Spacing	DS	2
(0028,0034)	Pixel Aspect Ratio	IS	2
(0028,0100)	Bits Allocated	US	1
(0028,0101)	Bits Stored	US	1
(0028,0102)	High Bit	US	1
(0028,0103)	Pixel Representation	US	1
(0028,0120)	Pixel Padding Value	US or SS	1
(0028,0300)	Quality Control Image	CS	1
(0028,0301)	Burned In Annotation	CS	1
(0028,1040)	Pixel Intensity Relationship	CS	1
(0028,1041)	Pixel Intensity Relationship Sign	SS	1
(0028,1050)	Window Center	DS	1-n
(0028,1051)	Window Width	DS	1-n
(0028,1052)	Rescale Intercept	DS	1
(0028,1053)	Rescale Slope	DS	1
(0028,1054)	Rescale Type	LO	1
(0028,1055)	Window Center & Width Explanation	LO	1-n
(0028,1056)	VOI LUT Function	CS	1
(0028,1300)	Implant Present	CS	1
(0028,1350)	Partial View	CS	1
(0028,1351)	Partial View Description	ST	1
(0028,1352)	Partial View Code Sequence	SQ	1
(0028,135A)	Spatial Locations Preserved	CS	1
(0028,2110)	Lossy Image Compression	CS	1
(0028,2112)	Lossy Image Compression Ratio	DS	1-n
(0028,2114)	Lossy Image Compression Method	CS	1-n
(0028,3000)	Modality LUT Sequence	SQ	1
(0028,3002)	LUT Descriptor	US or SS	3
(0028,3003)	LUT Explanation	LO	1
(0028,3004)	Modality LUT Type	LO	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0028,3006)	LUT Data	US or SS or OW	1-n 1
(0028,3010)	VOI LUT Sequence	SQ	1
(0028,3110)	Softcopy VOI LUT Sequence	SQ	1
(0032,1032)	Requesting Physician	PN	1
(0032,1033)	Requesting Service	LO	1
(0032,1060)	Requested Procedure Description	LO	1
(0032,1064)	Requested Procedure Code Sequence	SQ	1
(0032,1070)	Requested Contrast Agent	LO	1
(0032,4000)	Study Comments	LT	1
(0038,0300)	Current Patient Location	LO	1
(0038,0500)	Patient State	LO	1
(0038,4000)	Visit Comments	LT	1
(0040,0001)	Scheduled Station AE Title	AE	1-n
(0040,0002)	Scheduled Procedure Step Start Date	DA	1
(0040,0003)	Scheduled Procedure Step Start Time	TM	1
(0040,0004)	Scheduled Procedure Step End Date	DA	1
(0040,0005)	Scheduled Procedure Step End Time	TM	1
(0040,0006)	Scheduled Performing Physician's Name	PN	1
(0040,0007)	Scheduled Procedure Step Description	LO	1
(0040,0008)	Scheduled Protocol Code Sequence	SQ	1
(0040,0009)	Scheduled Procedure Step ID	SH	1
(0040,0010)	Scheduled Station Name	SH	1-n
(0040,0011)	Scheduled Procedure Step Location	SH	1
(0040,0012)	Pre-Medication	LO	1
(0040,0020)	Scheduled Procedure Step Status	CS	1
(0040,0100)	Scheduled Procedure Step Sequence	SQ	1
(0040,0241)	Performed Station AE Title	AE	1
(0040,0242)	Performed Station Name	SH	1
(0040,0243)	Performed Location	SH	1
(0040,0244)	Performed Procedure Step Start Date	DA	1
(0040,0245)	Performed Procedure Step Start Time	TM	1
(0040,0250)	Performed Procedure Step End Date	DA	1
(0040,0251)	Performed Procedure Step End Time	TM	1
(0040,0252)	Performed Procedure Step Status	CS	1
(0040,0253)	Performed Procedure Step ID	SH	1
(0040,0254)	Performed Procedure Step Description	LO	1
(0040,0255)	Performed Procedure Type Description	LO	1
(0040,0260)	Performed Protocol Code Sequence	SQ	1
(0040,0270)	Scheduled Step Attributes Sequence	SQ	1
(0040,0275)	Request Attributes Sequence	SQ	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	**Name**	**VR**	**VM**
(0040,0280)	Comments on the Performed Procedure Step	ST	1
(0040,0281)	Performed Procedure Step Discontinuation Reason Code Sequence	SQ	1
(0040,0300)	Total Time of Fluoroscopy	US	1
(0040,0301)	Total Number of Exposures	US	1
(0040,0302)	Entrance Dose	US	1
(0040,0303)	Exposed Area	US	1-2
(0040,0306)	Distance Source to Entrance	DS	1
(0040,030E)	Exposure Dose Sequence	SQ	1
(0040,0310)	Comments on Radiation Dose	ST	1
(0040,0312)	X-Ray Output	DS	1
(0040,0314)	Half Value Layer	DS	1
(0040,0316)	Organ Dose	DS	1
(0040,0318)	Organ Exposed	CS	1
(0040,0400)	Comments on the Scheduled Procedure Step	LT	1
(0040,1001)	Requested Procedure ID	SH	1
(0040,1002)	Reason for the Requested Procedure	LO	1
(0040,1003)	Requested Procedure Priority	SH	1
(0040,1004)	Patient Transport Arrangements	LO	1
(0040,1005)	Requested Procedure Location	LO	1
(0040,1400)	Requested Procedure Comments	LT	1
(0040,2016)	Placer Order Number / Imaging Service Request	LO	1
(0040,2017)	Filler Order Number / Imaging Service Request	LO	1
(0040,2400)	Imaging Service Request Comments	LT	1
(0040,8302)	Entrance Dose in mGy	DS	1
(0400,0550)	Modified Attributes Sequence	SQ	1
(0400,0561)	Original Attributes Sequence	SQ	1
(0400,0562)	Attribute Modification Date/time	DT	1
(0400,0563)	Modifying System	LO	1
(0400,0564)	Source of Previous Values	LO	1
(0400,0565)	Reason for the Attribute Modification	CS	1
(2000,0010)	Number of Copies	IS	1
(2000,001E)	Printer Configuration Sequence	SQ	1
(2000,0020)	Print Priority	CS	1
(2000,0030)	Medium Type	CS	1
(2000,0040)	Film Destination	CS	1
(2000,0050)	Film Session Label	LO	1
(2000,0060)	Memory Allocation	IS	1
(2000,0500)	Referenced Film Box Sequence	SQ	1
(2010,0010)	Image Display Format	ST	1
(2010,0040)	Film Orientation	CS	1

Table 1: Commonly-encountered DICOM Data Elements			
Tag	Name	VR	VM
(2010,0050)	Film Size ID	CS	1
(2010,0060)	Magnification Type	CS	1
(2010,0080)	Smoothing Type	CS	1
(2010,0100)	Border Density	CS	1
(2010,0120)	Min Density	US	1
(2010,0130)	Max Density	US	1
(2010,0140)	Trim	CS	1
(2010,0150)	Configuration Information	ST	1
(2010,0500)	Referenced Film Session Sequence	SQ	1
(2010,0510)	Referenced Image Box Sequence	SQ	1
(2020,0010)	Image Position	US	1
(2020,0030)	Requested Image Size	DS	1
(2020,0040)	Requested Decimate/Crop Behavior	CS	1
(2020,00A2)	Decimate/Crop Result	CS	1
(2020,0110)	Basic Grayscale Image Sequence	SQ	1
(2020,0111)	Basic Color Image Sequence	SQ	1
(2030,0010)	Annotation Position	US	1
(2030,0020)	Text String	LO	1
(2050,0010)	Presentation LUT Sequence	SQ	1
(2050,0020)	Presentation LUT Shape	CS	1
(2050,0500)	Referenced Presentation LUT Sequence	SQ	1
(2110,0010)	Printer Status	CS	1
(2110,0020)	Printer Status Info	CS	1
(2110,0030)	Printer Name	LO	1
(7FE0,0010)	Pixel Data	OW or OB	1
(FFFE,E000)	Item	n/a	n/a
(FFFE,E00D)	Item Delimitation Item	n/a	n/a
(FFFE,E0DD)	Sequence Delimitation Item	n/a	n/a

DICOM VRs

In DICOM, a VR§ (Value Representation) specifies what may and may not be used in the value of a particular Data Element. The following table is a list of VRs adapted from Part 5 of the DICOM standard (some definitions have been shortened for brevity).

To determine the VR of a particular Data Element, refer to the previous table.

Table 2: DICOM VRs			
VR Name	**Definition**	**Character Repertoire**	**Length of Value**
AE Application Entity	A string of characters that identifies an Application Entity with leading and trailing spaces (20H) being non-significant. A value consisting solely of spaces shall not be used.	Default Character Repertoire* excluding character code 5CH (the BACKSLASH "\" in ISO-IR 6), and control characters LF, FF, CR and ESC.	16 bytes maximum
AS Age String	A string of characters with one of the following formats -- nnnD, nnnW, nnnM, nnnY; where nnn shall contain the number of days for D, weeks for W, months for M, or years for Y. Example: "018M" would represent an age of 18 months.	"0"-"9", "D", "W", "M", "Y" of Default Character Repertoire	4 bytes fixed
AT Attribute Tag	Ordered pair of 16-bit unsigned integers that is the value of a Data Element Tag. Example: A Data Element Tag of (0018,00FF) would be encoded as a series of 4 bytes in a Little-Endian Transfer Syntax as 18H,00H,FFH,00H and in a Big-Endian Transfer Syntax as 00H,18H,00H,FFH.	not applicable	4 bytes fixed
CS Code String	A string of characters with leading or trailing spaces (20H) being non-significant.	Uppercase characters, "0"-"9", the SPACE character, and underscore "_", of the Default Character Repertoire	16 bytes maximum
DA Date	A string of characters of the format yyyymmdd; where yyyy shall contain year, mm shall contain the month, and dd shall contain the day. This conforms to the ANSI HISPP MSDS Date common data type. Example: "19930822" would represent August 22, 1993.	"0"-"9" of Default Character Repertoire	8 bytes fixed
DS Decimal String	A string of characters representing either a fixed point number or a floating point number. A fixed point number shall contain only the characters 0-9 with an optional leading "+" or "-" and an optional "." to mark the decimal point. A floating point number shall be conveyed as defined in	"0"-"9", "+", "-", "E", "e", "." of Default Character Repertoire	16 bytes maximum

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Table 2: DICOM VRs			
VR Name	**Definition**	**Character Repertoire**	**Length of Value**
	ANSI X3.9, with an "E" or "e" to indicate the start of the exponent. Decimal Strings may be padded with leading or trailing spaces. Embedded spaces are not allowed.		
DT Date Time	The Date Time common data type. Indicates a concatenated date-time ASCII string in the format: YYYYMMDDHHMMSS.FFFFFF&ZZZZ The components of this string, from left to right, are YYYY = Year, MM = Month, DD = Day, HH = Hour, MM = Minute, SS = Second, FFFFFF = Fractional Second, & = "+" or "-", and ZZZZ = Hours and Minutes of offset. &ZZZZ is an optional suffix for plus/minus offset from Coordinated Universal Time. A component that is omitted from the string is termed a null component. Trailing null components of Date Time are ignored. Non-trailing null components are prohibited, given that the optional suffix is not considered as a component.	"0"-"9", "+", "-", "." of Default Character Repertoire	26 bytes maximum
FL Floating Point Single	Single precision binary floating point number represented in IEEE 754:1985 32-bit Floating Point Number Format.	not applicable	4 bytes fixed
FD Floating Point Double	Double precision binary floating point number represented in IEEE 754:1985 64-bit Floating Point Number Format.	not applicable	8 bytes fixed
IS Integer String	A string of characters representing an Integer in base-10 (decimal), shall contain only the characters 0 - 9, with an optional leading "+" or "-". It may be padded with leading and/or trailing spaces. Embedded spaces are not allowed. The integer, n, represented shall be in the range: -2^{31} <= n <= $(2^{31} - 1)$.	"0"-"9", "+", "-" of Default Character Repertoire	12 bytes maximum
LO Long String	A character string that may be padded with leading and/or trailing spaces. The character code 5CH (the BACKSLASH "\" in ISO-IR 6) shall not be present, as it is used as the delimiter between values in multiple valued data elements. The string shall not have Control Characters except for ESC.	Default Character Repertoire and/or as defined by (0008,0005)	64 chars maximum
LT Long Text	A character string that may contain one or more paragraphs. It may contain the Graphic Character set and the Control Characters, CR, LF, FF, and ESC. It may be padded with trailing spaces, which may be ignored, but leading spaces are considered to be significant. Data Elements with this VR shall not be multi-valued and therefore character code 5CH (the BACKSLASH "\" in ISO-IR 6) may be used.	Default Character Repertoire and/or as defined by (0008,0005)	10240 chars maximum
OB Other Byte String	A string of bytes where the encoding of the contents is specified by the negotiated Transfer Syntax. OB is a VR which is insensitive to Little/Big Endian byte ordering (see Section 7.3). The string of bytes shall be padded with a single trailing NULL byte value (00H) when necessary to	not applicable	see Transfer Syntax definition in the DICOM standard

Table 2: DICOM VRs			
VR Name	**Definition**	**Character Repertoire**	**Length of Value**
	achieve even length.		
OF Other Float String	A string of 32-bit IEEE 754:1985 floating point words. OF is a VR which requires byte swapping within each 32-bit word when changing between Little Endian and Big Endian byte ordering	not applicable	2^{32}-4 maximum
OW Other Word String	A string of 16-bit words where the encoding of the contents is specified by the negotiated Transfer Syntax. OW is a VR that requires byte swapping within each word when changing between Little Endian and Big Endian byte ordering (see Section 7.3 in Part 5 of the DICOM standard).	not applicable	see Transfer Syntax definition
PN Person Name	A character string encoded using a 5 component convention. The character code 5CH (the BACKSLASH "\" in ISO-IR 6) shall not be present, as it is used as the delimiter between values in multiple valued data elements. The string may be padded with trailing spaces. For human use, the five components in their order of occurrence are: family name complex, given name complex, middle name, name prefix, name suffix. Any of the five components may be an empty string. The component delimiter shall be the caret "^" character (5EH). Delimiters are required for interior null components. Trailing null components and their delimiters may be omitted. Multiple entries are permitted in each component and are encoded as natural text strings, in the format preferred by the named person. This conforms to the ANSI HISPP MSDS Person Name common data type.	Default Character Repertoire and/or as defined by (0008,0005) excluding Control Characters LF, FF, and CR but allowing Control Character ESC.	64 chars max. per component group[*]

PN Examples:	Rev. John Robert Quincy Adams, B.A. M.Div.
	      "Adams^John Robert Quincy^^Rev.^B.A. M.Div."
	      [One family name; three given names; no middle name; one prefix; two suffixes.]
	
	Susan Morrison-Jones, Ph.D., Chief Executive Officer
	      "Morrison-Jones^Susan^^^Ph.D., Chief Executive Officer"
	      [Two family names; one given name; no middle name; no prefix; two suffixes.]
	
	John Doe
	      "Doe^John"
	      [One family name; one given name; no middle name, prefix, or suffix. Delimiters have been omitted for the three trailing null components.		

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[*] The lengths of Value Representations for which the Character Repertoire can be extended or replaced are expressly specified in characters rather than bytes. This is because the mapping from a character to the number of bytes used for that character's encoding may be dependent on the character set used.

Table 2: DICOM VRs

VR Name	Definition	Character Repertoire	Length of Value
SH Short String	A character string that may be padded with leading and/or trailing spaces. The character code 05CH (the BACKSLASH "\" in ISO-IR 6) shall not be present, as it is used as the delimiter between values for multiple data elements. The string shall not have Control Characters except ESC.	Default Character Repertoire and/or as defined by (0008,0005)	16 chars maximum[*]
SL Signed Long	Signed binary integer 32 bits long in 2's complement form. Represents an integer, n, in the range: $-2^{31} <= n <= (2^{31} - 1)$.	not applicable	4 bytes fixed
SQ Sequence of Items	Value is a Sequence of zero or more Items, as defined in Section 7.5 of PS 3.5.	not applicable	not applicable
SS Signed Short	Signed binary integer 16 bits long in 2's complement form. Represents an integer n in the range: $-2^{15} <= n <= (2^{15} - 1)$.	not applicable	2 bytes fixed
ST Short Text	A character string that may contain one or more paragraphs. It may contain the Graphic Character set and the Control Characters, CR, LF, FF, and ESC. It may be padded with trailing spaces, which may be ignored, but leading spaces are considered to be significant. Data Elements with this VR shall not be multi-valued and therefore character code 5CH (the BACKSLASH "\" in ISO-IR 6) may be used.	Default Character Repertoire and/or as defined by (0008,0005)	1024 chars maximum[*]
TM Time	A string of characters of the format hhmmss.frac; where hh contains hours (range "00" - "23"), mm contains minutes (range "00" - "59"), ss contains seconds (range "00" - "59"), and frac contains a fractional part of a second as small as 1 millionth of a second (range "000000" - "999999"). A 24 hour clock is assumed. Midnight can be represented by only "0000" since "2400" would violate the hour range. The string may be padded with trailing spaces. Leading and embedded spaces are not allowed. One or more of the components mm, ss, or frac may be unspecified as long as every component to the right of an unspecified component is also unspecified. If frac is unspecified the preceding "." may not be included. Frac shall be held to six decimal places or less to ensure its format conforms to the ANSI HISPP MSDS Time common data type. Examples: 1. "070907.0705 " represents a time of 7 hours, 9 minutes and 7.0705 seconds.	"0"-"9", "." of Default Character Repertoire	16 bytes maximum

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[*] The lengths of Value Representations for which the Character Repertoire can be extended or replaced are expressly specified in characters rather than bytes. This is because the mapping from a character to the number of bytes used for that character's encoding may be dependent on the character set used.

Table 2: DICOM VRs			
VR Name	**Definition**	**Character Repertoire**	**Length of Value**
	2. "1010" represents a time of 10 hours, and 10 minutes. 3. "021 " is an invalid value.		
UI Unique Identifier (UID)	A character string containing a UID that is used to uniquely identify a wide variety of items. The UID is a series of numeric components separated by the period "." character. If a Value Field containing one or more UIDs is an odd number of bytes in length, the Value Field shall be padded with a single trailing NULL (00H) character to ensure that the Value Field is an even number of bytes in length.	"0"-"9", "." of Default Character Repertoire	64 bytes maximum
UL Unsigned Long	Unsigned binary integer 32 bits long. Represents an integer n in the range: $0 <= n < 2^{32}$.	not applicable	4 bytes fixed
UN Unknown	A string of bytes where the encoding of the contents is unknown	not applicable	Any length valid for any of the other DICOM VRs
US Unsigned Short	Unsigned binary integer 16 bits long. Represents integer n in the range: $0 <= n < 2^{16}$.	not applicable	2 bytes fixed
UT Unlimited Text	A character string that may contain one or more paragraphs. It may contain the Graphic Character set and the Control Characters, CR, LF, FF, and ESC. It may be padded with trailing spaces, which may be ignored, but leading spaces are considered to be significant. Data Elements with this VR shall not be multi-valued and therefore character code 5CH (the BACKSLASH "\" in ISO-IR 6) may be used.	Default Character Repertoire[*] and/or as defined by (0008,0005)	$2^{32}-2$[†]

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[*] In DICOM, the default character repertoire is the "Basic G0 Set of the International Reference Version of ISO 646:1990 (ISO-IR 6)." This set is identical to the ISO 8859 character set, also known as ISO-IR-100 or "Latin 1". This character set is used throughout North and South America, western Europe, Oceania, and much of Africa. It is also commonly used in most standard romanizations of Asian languages.

[†] Limited only by the size of the maximum unsigned integer representable in a 32 bit VL field minus one, since FFFFFFFFH is reserved.

DICOM UIDs

UIDs (unique identifiers) are used in a DICOM to identify many types of objects including SOP Classes and Transfer Syntaxes.

When checking for DICOM conformance, it is important to compare not only SOP class names, but UIDs as well. For example, if a particular device is presented as supporting "Ultrasound Storage", does it support the currently active Ultrasound Storage SOP class, or the retired one? Checking the SOP Class UID is the best way to be sure. For example, the following SOP classes have the same name but a different UID:

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage

In DICOM, UIDs have two parts: the root, which identifies a particular organization, and a suffix. For our Ultrasound example, these are as follows:

UID Root	UID Suffix
1.2.840.10008.	5.1.4.1.1.6

The root **1.2.840.10008**. is reserved for DICOM. If a different root is present in a SOP Class or Transfer Syntax UID, it is a private UID which will have non-standard properties.

The following tables are a partial list of DICOM UIDs drawn from Part 6 of the DICOM standard. The first table lists SOP Class UIDS. The second table lists Transfer Syntax UIDs. The third table lists miscellaneous UIDs. In each table, Part refers to the part of the DICOM standard where the object in question is described in detail.

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.4.1.1.9.1.1	12-lead ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.1.3	Ambulatory ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.5.1	Arterial Pulse Waveform Storage
1.2.840.10008.5.1.4.1.1.88.2	Audio SR Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.78.2	Autorefraction Measurements Storage
1.2.840.10008.5.1.1.15	Basic Annotation Box SOP Class
1.2.840.10008.5.1.1.4.1	Basic Color Image Box SOP Class
1.2.840.10008.5.1.1.18	Basic Color Print Management Meta SOP Class
1.2.840.10008.5.1.1.2	Basic Film Box SOP Class
1.2.840.10008.5.1.1.1	Basic Film Session SOP Class
1.2.840.10008.5.1.1.4	Basic Grayscale Image Box SOP Class
1.2.840.10008.5.1.1.9	Basic Grayscale Print Management Meta SOP Class
1.2.840.10008.5.1.1.24.1	Basic Print Image Overlay Box SOP Class (Retired)
1.2.840.10008.5.1.4.1.1.131	Basic Structured Display Storage
1.2.840.10008.1.9	Basic Study Content Notification SOP Class (Retired)
1.2.840.10008.5.1.4.1.1.88.11	Basic Text SR Storage
1.2.840.10008.5.1.4.1.1.9.4.1	Basic Voice Audio Waveform Storage
1.2.840.10008.5.1.4.1.1.11.4	Blending Softcopy Presentation State Storage SOP Class
1.2.840.10008.5.1.4.37.2	Breast Imaging Relevant Patient Information Query
1.2.840.10008.5.1.4.1.1.13.1.4	Breast Projection X-Ray Image Storage – For Presentation
1.2.840.10008.5.1.4.1.1.13.1.5	Breast Projection X-Ray Image Storage – For Processing
1.2.840.10008.5.1.4.1.1.13.1.3	Breast Tomosynthesis Image Storage
1.2.840.10008.5.1.4.1.1.9.3.1	Cardiac Electrophysiology Waveform Storage
1.2.840.10008.5.1.4.37.3	Cardiac Relevant Patient Information Query
1.2.840.10008.5.1.4.1.1.88.65	Chest CAD SR Storage
1.2.840.10008.5.1.4.1.1.88.69	Colon CAD SR Storage
1.2.840.10008.5.1.4.39.1	Color Palette Storage
1.2.840.10008.5.1.4.39.2	Color Palette Information Model – FIND
1.2.840.10008.5.1.4.39.4	Color Palette Information Model – GET
1.2.840.10008.5.1.4.39.3	Color Palette Information Model – MOVE
1.2.840.10008.5.1.4.1.1.11.2	Color Softcopy Presentation State Storage SOP Class
1.2.840.10008.5.1.4.1.2.5.3	Composite Instance Retrieve Without Bulk Data – GET
1.2.840.10008.5.1.4.1.2.4.3	Composite Instance Root Retrieve – GET

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.4.1.2.4.2	Composite Instance Root Retrieve – MOVE
1.2.840.10008.5.1.4.1.1.88.34	Comprehensive 3D SR Storage
1.2.840.10008.5.1.4.1.1.88.33	Comprehensive SR Storage
1.2.840.10008.5.1.4.1.1.88.4	Comprehensive SR Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.1	Computed Radiography Image Storage
1.2.840.10008.5.1.4.1.1.82.1	Corneal Topography Map Storage
1.2.840.10008.5.1.4.1.1.2	CT Image Storage
1.2.840.10008.5.1.4.1.1.66.3	Deformable Spatial Registration Storage
1.2.840.10008.3.1.2.6.1	Detached Interpretation Management SOP Class (Retired)
1.2.840.10008.3.1.2.1.4	Detached Patient Management Meta SOP Class (Retired)
1.2.840.10008.3.1.2.1.1	Detached Patient Management SOP Class (Retired)
1.2.840.10008.3.1.2.5.4	Detached Results Management Meta SOP Class (Retired)
1.2.840.10008.3.1.2.5.1	Detached Results Management SOP Class (Retired)
1.2.840.10008.3.1.2.5.5	Detached Study Management Meta SOP Class (Retired)
1.2.840.10008.3.1.2.3.1	Detached Study Management SOP Class (Retired)
1.2.840.10008.3.1.2.2.1	Detached Visit Management SOP Class (Retired)
1.2.840.10008.5.1.4.1.1.88.3	Detail SR Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.501.4	DICOS 2D AIT Storage
1.2.840.10008.5.1.4.1.1.501.5	DICOS 3D AIT Storage
1.2.840.10008.5.1.4.1.1.501.1	DICOS CT Image Storage
1.2.840.10008.5.1.4.1.1.501.2.1	DICOS Digital X-Ray Image Storage – For Presentation
1.2.840.10008.5.1.4.1.1.501.2.2	DICOS Digital X-Ray Image Storage – For Processing
1.2.840.10008.5.1.4.1.1.501.6	DICOS Quadrupole Resonance (QR) Storage
1.2.840.10008.5.1.4.1.1.501.3	DICOS Threat Detection Report Storage
1.2.840.10008.5.1.4.1.1.1.3	Digital Intra-oral X-Ray Image Storage – For Presentation
1.2.840.10008.5.1.4.1.1.1.3.1	Digital Intra-oral X-Ray Image Storage – For Processing
1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography X-Ray Image Storage – For Presentation
1.2.840.10008.5.1.4.1.1.1.2.1	Digital Mammography X-Ray Image Storage – For Processing
1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage – For Presentation
1.2.840.10008.5.1.4.1.1.1.1.1	Digital X-Ray Image Storage – For Processing
1.2.840.10008.5.1.1.40	Display System SOP Class
1.2.840.10008.5.1.4.1.1.601.1	Eddy Current Image Storage

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.4.1.1.601.2	Eddy Current Multi-frame Image Storage
1.2.840.10008.5.1.4.1.1.104.2	Encapsulated CDA Storage
1.2.840.10008.5.1.4.1.1.104.1	Encapsulated PDF Storage
1.2.840.10008.5.1.4.1.1.2.1	Enhanced CT Image Storage
1.2.840.10008.5.1.4.1.1.4.3	Enhanced MR Color Image Storage
1.2.840.10008.5.1.4.1.1.4.1	Enhanced MR Image Storage
1.2.840.10008.5.1.4.1.1.130	Enhanced PET Image Storage
1.2.840.10008.5.1.4.1.1.88.22	Enhanced SR Storage
1.2.840.10008.5.1.4.1.1.6.2	Enhanced US Volume Storage
1.2.840.10008.5.1.4.1.1.12.1.1	Enhanced XA Image Storage
1.2.840.10008.5.1.4.1.1.12.2.1	Enhanced XRF Image Storage
1.2.840.10008.5.1.4.1.1.88.35	Extensible SR Storage
1.2.840.10008.5.1.4.1.1.9.4.2	General Audio Waveform Storage
1.2.840.10008.5.1.4.1.1.9.1.2	General ECG Waveform Storage
1.2.840.10008.5.1.4.32.3	General Purpose Performed Procedure Step SOP Class (Retired)
1.2.840.10008.5.1.4.32.2	General Purpose Scheduled Procedure Step SOP Class (Retired)
1.2.840.10008.5.1.4.32.1	General Purpose Worklist Information Model – FIND (Retired)
1.2.840.10008.5.1.4.32	General Purpose Worklist Management Meta SOP Class (Retired)
1.2.840.10008.5.1.4.37.1	General Relevant Patient Information Query
1.2.840.10008.5.1.4.43.2	Generic Implant Template Information Model – FIND
1.2.840.10008.5.1.4.43.4	Generic Implant Template Information Model – GET
1.2.840.10008.5.1.4.43.3	Generic Implant Template Information Model – MOVE
1.2.840.10008.5.1.4.43.1	Generic Implant Template Storage
1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy Presentation State Storage SOP Class
1.2.840.10008.5.1.4.38.2	Hanging Protocol Information Model – FIND
1.2.840.10008.5.1.4.38.4	Hanging Protocol Information Model – GET
1.2.840.10008.5.1.4.38.3	Hanging Protocol Information Model – MOVE
1.2.840.10008.5.1.4.38.1	Hanging Protocol Storage
1.2.840.10008.5.1.1.30	Hardcopy Color Image Storage SOP Class (Retired)
1.2.840.10008.5.1.1.29	Hardcopy Grayscale Image Storage SOP Class (Retired)
1.2.840.10008.5.1.4.1.1.9.2.1	Hemodynamic Waveform Storage

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.1.24	Image Overlay Box SOP Class (Retired)
1.2.840.10008.5.1.4.44.2	Implant Assembly Template Information Model – FIND
1.2.840.10008.5.1.4.44.4	Implant Assembly Template Information Model – GET
1.2.840.10008.5.1.4.44.3	Implant Assembly Template Information Model – MOVE
1.2.840.10008.5.1.4.44.1	Implant Assembly Template Storage
1.2.840.10008.5.1.4.45.2	Implant Template Group Information Model – FIND
1.2.840.10008.5.1.4.45.4	Implant Template Group Information Model – GET
1.2.840.10008.5.1.4.45.3	Implant Template Group Information Model – MOVE
1.2.840.10008.5.1.4.45.1	Implant Template Group Storage
1.2.840.10008.5.1.4.1.1.88.70	Implantation Plan SR Storage
1.2.840.10008.5.1.4.33	Instance Availability Notification SOP Class
1.2.840.10008.5.1.4.1.1.78.8	Intraocular Lens Calculations Storage
1.2.840.10008.5.1.4.1.1.14.1	Intravascular Optical Coherence Tomography Image Storage – For Presentation
1.2.840.10008.5.1.4.1.1.14.2	Intravascular Optical Coherence Tomography Image Storage – For Processing
1.2.840.10008.5.1.4.1.1.78.3	Keratometry Measurements Storage
1.2.840.10008.5.1.4.1.1.88.59	Key Object Selection Document Storage
1.2.840.10008.5.1.4.1.1.2.2	Legacy Converted Enhanced CT Image Storage
1.2.840.10008.5.1.4.1.1.4.4	Legacy Converted Enhanced MR Image Storage
1.2.840.10008.5.1.4.1.1.128.1	Legacy Converted Enhanced PET Image Storage
1.2.840.10008.5.1.4.1.1.78.1	Lensometry Measurements Storage
1.2.840.10008.5.1.4.1.1.79.1	Macular Grid Thickness and Volume Report Storage
1.2.840.10008.5.1.4.1.1.88.50	Mammography CAD SR Storage
1.2.840.10008.5.1.1.33	Media Creation Management SOP Class UID
1.2.840.10008.1.3.10	Media Storage Directory Storage
1.2.840.10008.3.1.2.3.5	Modality Performed Procedure Step Notification SOP Class
1.2.840.10008.3.1.2.3.4	Modality Performed Procedure Step Retrieve SOP Class
1.2.840.10008.3.1.2.3.3	Modality Performed Procedure Step SOP Class
1.2.840.10008.5.1.4.31	Modality Worklist Information Model – FIND
1.2.840.10008.5.1.4.1.1.4	MR Image Storage
1.2.840.10008.5.1.4.1.1.4.2	MR Spectroscopy Storage
1.2.840.10008.5.1.4.1.1.7.2	Multi-frame Grayscale Byte Secondary Capture Image Storage

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.4.1.1.7.3	Multi-frame Grayscale Word Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.1	Multi-frame Single Bit Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.4	Multi-frame True Color Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.20	Nuclear Medicine Image Storage
1.2.840.10008.5.1.4.1.1.5	Nuclear Medicine Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.78.7	Ophthalmic Axial Measurements Storage
1.2.840.10008.5.1.4.1.1.77.1.5.2	Ophthalmic Photography 16 Bit Image Storage
1.2.840.10008.5.1.4.1.1.77.1.5.1	Ophthalmic Photography 8 Bit Image Storage
1.2.840.10008.5.1.4.1.1.81.1	Ophthalmic Thickness Map Storage
1.2.840.10008.5.1.4.1.1.77.1.5.4	Ophthalmic Tomography Image Storage
1.2.840.10008.5.1.4.1.1.80.1	Ophthalmic Visual Field Static Perimetry Measurements Storage
1.2.840.10008.5.1.4.1.1.30	Parametric Map Storage
1.2.840.10008.5.1.4.1.2.1.1	Patient Root Query/Retrieve Information Model – FIND
1.2.840.10008.5.1.4.1.2.1.3	Patient Root Query/Retrieve Information Model – GET
1.2.840.10008.5.1.4.1.2.1.2	Patient Root Query/Retrieve Information Model – MOVE
1.2.840.10008.5.1.4.1.2.3.1	Patient/Study Only Query/Retrieve Information Model – FIND (Retired)
1.2.840.10008.5.1.4.1.2.3.3	Patient/Study Only Query/Retrieve Information Model – GET (Retired)
1.2.840.10008.5.1.4.1.2.3.2	Patient/Study Only Query/Retrieve Information Model – MOVE (Retired)
1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage
1.2.840.10008.5.1.1.23	Presentation LUT SOP Class
1.2.840.10008.5.1.1.14	Print Job SOP Class
1.2.840.10008.5.1.1.26	Print Queue Management SOP Class (Retired)
1.2.840.10008.5.1.1.16.376	Printer Configuration Retrieval SOP Class
1.2.840.10008.5.1.1.16	Printer SOP Class
1.2.840.10008.1.40	Procedural Event Logging SOP Class
1.2.840.10008.5.1.4.1.1.88.40	Procedure Log Storage
1.2.840.10008.5.1.4.41	Product Characteristics Query SOP Class
1.2.840.10008.5.1.4.1.1.11.3	Pseudo-Color Softcopy Presentation State Storage SOP Class
1.2.840.10008.5.1.1.31	Pull Print Request SOP Class (Retired)

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.1.32	Pull Stored Print Management Meta SOP Class (Retired)
1.2.840.10008.5.1.4.1.1.88.68	Radiopharmaceutical Radiation Dose SR Storage
1.2.840.10008.5.1.4.1.1.66	Raw Data Storage
1.2.840.10008.5.1.4.1.1.67	Real World Value Mapping Storage
1.2.840.10008.5.1.1.18.1	Referenced Color Print Management Meta SOP Class (Retired)
1.2.840.10008.5.1.1.9.1	Referenced Grayscale Print Management Meta SOP Class (Retired)
1.2.840.10008.5.1.1.4.2	Referenced Image Box SOP Class (Retired)
1.2.840.10008.5.1.4.1.1.9.6.1	Respiratory Waveform Storage
1.2.840.10008.5.1.4.34.7	RT Beams Delivery Instruction Storage
1.2.840.10008.5.1.4.34.1	RT Beams Delivery Instruction Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.481.4	RT Beams Treatment Record Storage
1.2.840.10008.5.1.4.1.1.481.6	RT Brachy Treatment Record Storage
1.2.840.10008.5.1.4.34.8	RT Conventional Machine Verification
1.2.840.10008.5.1.4.34.2	RT Conventional Machine Verification – Trial (Retired)
1.2.840.10008.5.1.4.1.1.481.2	RT Dose Storage
1.2.840.10008.5.1.4.1.1.481.1	RT Image Storage
1.2.840.10008.5.1.4.1.1.481.9	RT Ion Beams Treatment Record Storage
1.2.840.10008.5.1.4.34.9	RT Ion Machine Verification
1.2.840.10008.5.1.4.34.3	RT Ion Machine Verification – Trial (Retired)
1.2.840.10008.5.1.4.1.1.481.8	RT Ion Plan Storage
1.2.840.10008.5.1.4.1.1.481.5	RT Plan Storage
1.2.840.10008.5.1.4.1.1.481.3	RT Structure Set Storage
1.2.840.10008.5.1.4.1.1.481.7	RT Treatment Summary Record Storage
1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.66.4	Segmentation Storage
1.2.840.10008.5.1.4.1.1.66.2	Spatial Fiducials Storage
1.2.840.10008.5.1.4.1.1.66.1	Spatial Registration Storage
1.2.840.10008.5.1.4.1.1.78.6	Spectacle Prescription Report Storage
1.2.840.10008.5.1.4.1.1.9	Standalone Curve Storage (Retired)
1.2.840.10008.5.1.4.1.1.10	Standalone Modality LUT Storage (Retired)
1.2.840.10008.5.1.4.1.1.8	Standalone Overlay Storage (Retired)
1.2.840.10008.5.1.4.1.1.129	Standalone PET Curve Storage (Retired)

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.4.1.1.11	Standalone VOI LUT Storage (Retired)
1.2.840.10008.5.1.4.1.1.77.1.5.3	Stereometric Relationship Storage
1.2.840.10008.1.20.2	Storage Commitment Pull Model SOP Class (Retired)
1.2.840.10008.1.20.1	Storage Commitment Push Model SOP Class
1.2.840.10008.5.1.1.27	Stored Print Storage SOP Class (Retired)
1.2.840.10008.3.1.2.3.2	Study Component Management SOP Class (Retired)
1.2.840.10008.5.1.4.1.2.2.1	Study Root Query/Retrieve Information Model – FIND
1.2.840.10008.5.1.4.1.2.2.3	Study Root Query/Retrieve Information Model – GET
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Information Model – MOVE
1.2.840.10008.5.1.4.1.1.78.4	Subjective Refraction Measurements Storage
1.2.840.10008.1.42	Substance Administration Logging SOP Class
1.2.840.10008.5.1.4.42	Substance Approval Query SOP Class
1.2.840.10008.5.1.4.1.1.68.1	Surface Scan Mesh Storage
1.2.840.10008.5.1.4.1.1.68.2	Surface Scan Point Cloud Storage
1.2.840.10008.5.1.4.1.1.66.5	Surface Segmentation Storage
1.2.840.10008.5.1.4.1.1.88.1	Text SR Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage
1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multi-frame Image Storage
1.2.840.10008.5.1.4.1.1.3	Ultrasound Multi-frame Image Storage (Retired)
1.2.840.10008.5.1.4.34.6.4	Unified Procedure Step – Event SOP Class
1.2.840.10008.5.1.4.34.4.4	Unified Procedure Step – Event SOP Class – Trial (Retired)
1.2.840.10008.5.1.4.34.6.3	Unified Procedure Step – Pull SOP Class
1.2.840.10008.5.1.4.34.4.3	Unified Procedure Step – Pull SOP Class – Trial (Retired)
1.2.840.10008.5.1.4.34.6.1	Unified Procedure Step – Push SOP Class
1.2.840.10008.5.1.4.34.4.1	Unified Procedure Step – Push SOP Class – Trial (Retired)
1.2.840.10008.5.1.4.34.6.2	Unified Procedure Step – Watch SOP Class
1.2.840.10008.5.1.4.34.4.2	Unified Procedure Step – Watch SOP Class – Trial (Retired)
1.2.840.10008.1.1	Verification SOP Class
1.2.840.10008.5.1.4.1.1.77.1.1.1	Video Endoscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.2.1	Video Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.4.1	Video Photographic Image Storage
1.2.840.10008.5.1.4.1.1.78.5	Visual Acuity Measurements Storage

Table 3: SOP Class UIDs	
UID Value	**UID Name**
1.2.840.10008.5.1.4.1.1.77.1.1	VL Endoscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1	VL Image Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.77.1.2	VL Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.2	VL Multi-frame Image Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.77.1.4	VL Photographic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.3	VL Slide-Coordinates Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.6	VL Whole Slide Microscopy Image Storage
1.2.840.10008.5.1.1.22	VOI LUT Box SOP Class
1.2.840.10008.5.1.4.1.1.9.1	Waveform Storage – Trial (Retired)
1.2.840.10008.5.1.4.1.1.77.1.5.6	Wide Field Ophthalmic Photography 3D Coordinates Image Storage
1.2.840.10008.5.1.4.1.1.77.1.5.5	Wide Field Ophthalmic Photography Stereographic Projection Image Storage
1.2.840.10008.5.1.4.1.1.11.5	XA/XRF Grayscale Softcopy Presentation State Storage
1.2.840.10008.5.1.4.1.1.13.1.1	X-Ray 3D Angiographic Image Storage
1.2.840.10008.5.1.4.1.1.13.1.2	X-Ray 3D Craniofacial Image Storage
1.2.840.10008.5.1.4.1.1.12.3	X-Ray Angiographic Bi-Plane Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage
1.2.840.10008.5.1.4.1.1.88.67	X-Ray Radiation Dose SR Storage
1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage

Table 4: Transfer Syntax UIDs	
UID Value	**UID Name**
1.2.840.10008.1.2.1.99	Deflated Explicit VR Little Endian
1.2.840.10008.1.2.2	Explicit VR Big Endian (Retired)
1.2.840.10008.1.2.1	Explicit VR Little Endian
1.2.840.10008.1.2	Implicit VR Little Endian: Default Transfer Syntax for DICOM
1.2.840.10008.1.2.4.91	JPEG 2000 Image Compression
1.2.840.10008.1.2.4.90	JPEG 2000 Image Compression (Lossless Only)
1.2.840.10008.1.2.4.93	JPEG 2000 Part 2 Multi-component Image Compression
1.2.840.10008.1.2.4.92	JPEG 2000 Part 2 Multi-component Image Compression (Lossless Only)
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression

Table 4: Transfer Syntax UIDs	
UID Value	**UID Name**
1.2.840.10008.1.2.4.51	JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4 only)
1.2.840.10008.1.2.4.52	JPEG Extended (Process 3 & 5) (Retired)
1.2.840.10008.1.2.4.59	JPEG Extended, Hierarchical (Process 16 & 18) (Retired)
1.2.840.10008.1.2.4.60	JPEG Extended, Hierarchical (Process 17 & 19) (Retired)
1.2.840.10008.1.2.4.63	JPEG Full Progression, Hierarchical (Process 24 & 26) (Retired)
1.2.840.10008.1.2.4.64	JPEG Full Progression, Hierarchical (Process 25 & 27) (Retired)
1.2.840.10008.1.2.4.55	JPEG Full Progression, Non-Hierarchical (Process 10 & 12) (Retired)
1.2.840.10008.1.2.4.56	JPEG Full Progression, Non-Hierarchical (Process 11 & 13) (Retired)
1.2.840.10008.1.2.4.65	JPEG Lossless, Hierarchical (Process 28) (Retired)
1.2.840.10008.1.2.4.66	JPEG Lossless, Hierarchical (Process 29) (Retired)
1.2.840.10008.1.2.4.57	JPEG Lossless, Non-Hierarchical (Process 14)
1.2.840.10008.1.2.4.58	JPEG Lossless, Non-Hierarchical (Process 15) (Retired)
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression
1.2.840.10008.1.2.4.61	JPEG Spectral Selection, Hierarchical (Process 20 & 22) (Retired)
1.2.840.10008.1.2.4.62	JPEG Spectral Selection, Hierarchical (Process 21 & 23) (Retired)
1.2.840.10008.1.2.4.53	JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8) (Retired)
1.2.840.10008.1.2.4.54	JPEG Spectral Selection, Non-Hierarchical (Process 7 & 9) (Retired)
1.2.840.10008.1.2.4.80	JPEG-LS Lossless Image Compression
1.2.840.10008.1.2.4.81	JPEG-LS Lossy (Near-Lossless) Image Compression
1.2.840.10008.1.2.4.94	JPIP Referenced
1.2.840.10008.1.2.4.95	JPIP Referenced Deflate
1.2.840.10008.1.2.4.101	MPEG2 Main Profile @ High Level
1.2.840.10008.1.2.4.100	MPEG2 Main Profile @ Main Level
1.2.840.10008.1.2.4.103	MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1
1.2.840.10008.1.2.4.102	MPEG-4 AVC/H.264 High Profile / Level 4.1
1.2.840.10008.1.2.4.104	MPEG-4 AVC/H.264 High Profile / Level 4.2 For 2D Video

Table 4: Transfer Syntax UIDs	
UID Value	**UID Name**
1.2.840.10008.1.2.4.105	MPEG-4 AVC/H.264 High Profile / Level 4.2 For 3D Video
1.2.840.10008.1.2.4.106	MPEG-4 AVC/H.264 Stereo High Profile / Level 4.2
1.2.840.10008.1.2.6.1	RFC 2557 MIME encapsulation
1.2.840.10008.1.2.5	RLE Lossless
1.2.840.10008.1.2.6.2	XML Encoding

Table 5: Miscellaneous UIDs			
UID Value	**UID Name**	**UID Type**	**Part**
1.2.840.10008.3.1.1.1	DICOM Application Context Name	Application Context Name	3.7
1.2.840.10008.2.16.4	DICOM Controlled Terminology	Coding Scheme	3.16
1.2.840.10008.2.6.1	DICOM UID Registry	DICOM UIDs as a Coding Scheme	3.6
1.2.840.10008.15.0.3.XX	Information to be retrieved using LDAP	LDAP OID	3.15
1.2.840.10008.15.0.4.XX	Information to be retrieved using LDAP	LDAP OID	3.15
1.2.840.10008.5.1.1.17	Printer SOP Instance	Well-known Printer SOP Instance	3.4
1.2.840.10008.5.1.1.17.376	Printer Configuration Retrieval SOP Instance	Well-known Printer SOP Instance	3.4
1.2.840.10008.1.40.1	Procedural Event Logging SOP Instance	Well-known SOP Instance	3.4
1.2.840.10008.1.20.1.1	Storage Commitment Push Model SOP Instance	Well-known SOP Instance	3.4
1.2.840.10008.4.2	Storage Service Class	Service Class	3.4
1.2.840.10008.1.4.1.X	Various frame of references	Frame of reference	3.5