DICOM Conformance Statement

Retina Workplace

Version 2.7

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1 Conformance Statement Overview

Retina Workplace is a software application that is integrated into FORUM as a plugin. The software provides interactive display and analysis of OCT data and fundus images from retina examinations.

Retina Workplace supports doctors in analysis and monitoring of changes to the macula. The analysis is carried out on the basis of OCT images and fundus images of the patient.

The central function of the Retina Workplace is visualization of OCT images in a TripleView, consisting of the fundus image, B-scan, and analysis data. Up to three TripleViews can be displayed simultaneously in the Retina Workplace work area.

OCT images and fundus images captured by the following devices can be displayed and analyzed with Retina Workplace:

- ZEISS CIRRUS OCT devices
- Fundus cameras (any fundus image in DICOM Ophthalmic Photography 8 Bit (OP) format)

Retina Workplace provides its own preselections in FORUM but can also be used to open one or more OCT images directly. Suitable images are macular cube scans, OCT angiography scans and raster scans of the macula. When using suitable OCT images and fundus images, fundus images can be registered with macular cube scans and raster scans with macular cube scans or fundus images.

The overall DICOM communication of Retina Workplace is managed by FORUM. To understand the FORUM supported network services and the FORUM Implementation Model please refer to the FORUM DICOM Conformance Statement.

The current document only describes the specifics for Retina Workplace, these are mainly the specific Storage IODs.

This document is structured as suggested in the DICOM Standard (PS 3.2: Conformance).

2 Table of Contents

3 Introduction

3.1 Revision History

Table 3-1 Revision History

Document Version	Date	Author	Changes
1.0	2015-06-10	Rms	Initial revision for Retina Workplace v1.0
1.1	2016-11-29	Rms	Revision for Retina Workplace v2.0 - Raw Data IOD for Clinical Events added New scan types and analysis types to Encapsulated PDF added.
1.2	2018-03-05	Rms	Revision for Retina Workplace v2.5 - Encapsulated PDF supporting new scan types (Angiography 3x3 mm", "Angiography 6x6 mm", "Angiography 8x8 mm") and new analysis (Angiography Change Analysis) - Language pack version removed from attribute (0018,1020) Software Version(s) - PoV and Source corrected in Raw Data IOD – Patient Module Note about Mapping of AcqusitionDatetime in chapter 8.1.3 added
1.3	2018-03-05	Rms	Revision for Retina Workplace v2.6 - Changed StudyID handling added Contributing Equipment Sequence
01	2021-10-19	Yde	Revision for Retina Workplace v2.7 - Applied new template. - Introduced new document number and version. - Updated Encapsulated PDF IOD attributes (Document Title, Series Description, Performed Procedure Step Description).

3.2 Audience

This document is written for the people that need to understand how Retina Workplace will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between Retina Workplace and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

3.4 Definitions and Terms

Informal definitions are provided for the following terms used in this Conformance Statement.

The DICOM Standard is the authoritative source for formal definitions of these terms.

Application Entity (AE)

An end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title

The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Attribute

A unit of information in an object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements.

Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD)

The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).

Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Media Application Profile

The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module

A set of Attributes within an Information Object Definition that are logically related to each other.

Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date,

Service/Object Pair (SOP) Class

The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification.

Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance

An information object; a specific occurrence of information exchanged in a SOP Class.

Examples: a specific x-ray image.

Tag

A 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the “group” and the “element”. If the “group” number is odd, the tag is for a private (manufacturer-specific) data element.

Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax

The encoding used for exchange of DICOM information objects and messages.

Examples: JPEG compressed (images), little endian explicit value representation.

Unique Identifier (UID)

A globally unique “dotted decimal” string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier.

Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR)

The format type of an individual DICOM data element, such as text, an integer, a person’s name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Abbreviations

Table 3-2 Abbreviations used in this Document

Abbreviation	Definition
AE	Application Entity
AET	Application Entity Title
DICOM	Digital Imaging and Communications in Medicine
EMR	Electronic Medical Record
EPDF	Encapsulated Portable Document Format
IOD	Information Object Definition
SOP	Service Object Pair, union of a specific DICOM service and related IOD.
UI	User Interface
UID	Unique Identifier
VM	Value Multiplicity
VR	Value Representation

3.6 References

NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at http://medical.nema.org/).

Integrating the Healthcare Enterprise (IHE) EYECARE Technical Framework, rev 4.0, 2016 (available free at *http://www.ihe.net/Technical_Framework/index.cfm*).

FORUM DICOM Conformance Statements (available at http://www.zeiss.com/dicom).

4 Networking

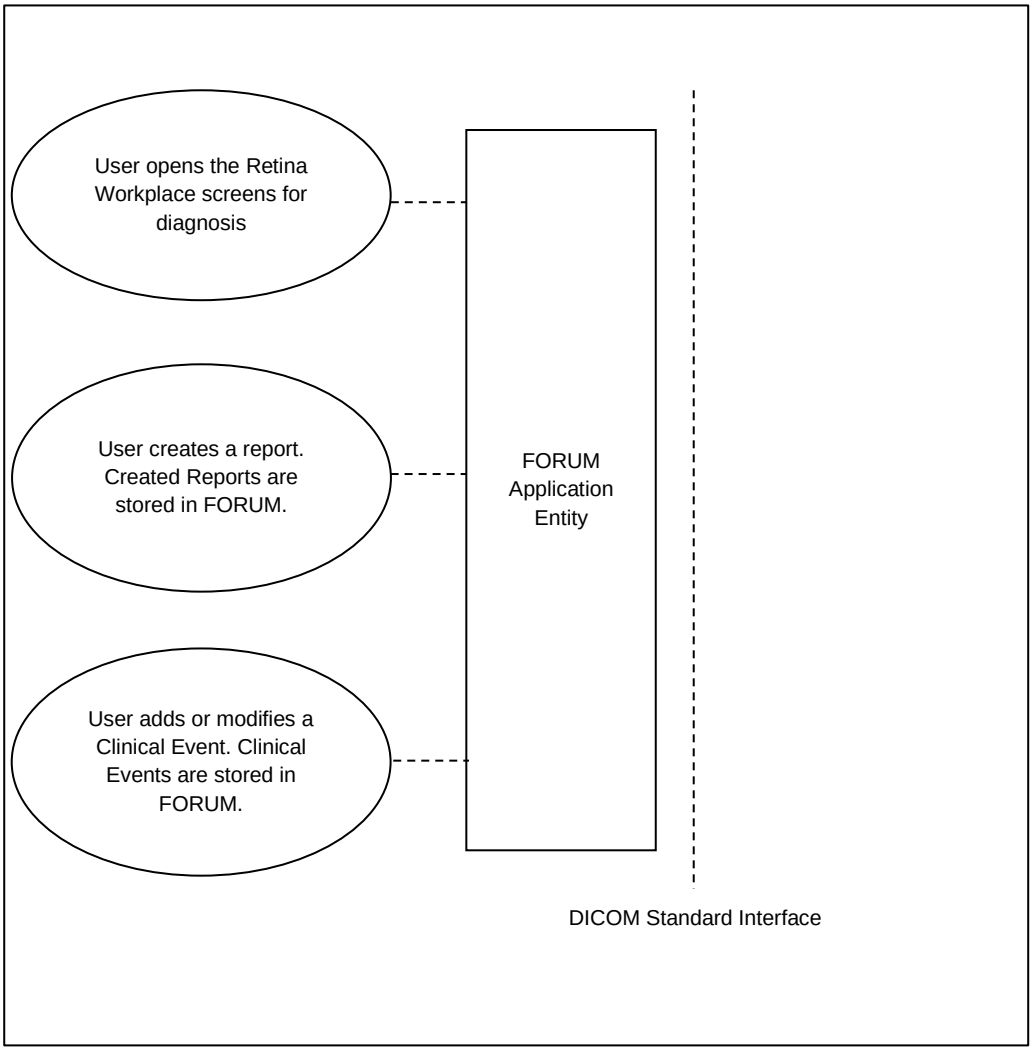
4.1 Implementation Model

4.1.1 Application Data Flow

Figure 4-1 Functional Overview

All DICOM related local and real-world activities of FORUM Archive as described in the FORUM DICOM Conformance Statement remain valid.

The local activities described in the application data flow diagram below are additional activities to the functional range of FORUM Archive described in **Fehler! Verweisquelle konnte nicht gefunden werden.** of the FORUM DICOM Conformance Statement. These additional activities are added with the installation of the Retina Workplace as software plugin to FORUM.



4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of FORUM Application Entity

See FORUM DICOM Conformance Statement.

4.1.2.2 Functional Definition of FORUM Worklist Application Entity

See FORUM DICOM Conformance Statement.

4.1.2.3 Functional Definition of Retina Workplace

Retina Workplace is a software application that is integrated into FORUM as a plugin. The software provides interactive display and analysis of OCT data and fundus images from retina examinations.

Retina Workplace supports doctors in analysis and monitoring of changes to the macula. The analysis is carried out on the basis of OCT images and fundus images of the patient.

The central function of the Retina Workplace is visualization of OCT images in a TripleView, consisting of the fundus image, B-scan, and analysis data. Up to three TripleViews can be displayed simultaneously in the Retina Workplace work area.

OCT images and fundus images captured by the following devices can be displayed and analyzed with Retina Workplace:

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Retina Workplace provides its own preselections in FORUM but can also be used to open one or more OCT images directly. Suitable images are macular cube scans, OCT angiography scans and raster scans of the macula. When using suitable OCT images and fundus images, fundus images can be registered with macular cube scans and raster scans with macular cube scans or fundus images.

Retina Workplace offers the following functionality:

- Processing and displaying of optical coherence tomography data and fundus images
- Generation of reports with results from optical coherence tomography and fundus photography
- Usage of CIRRUS algorithms and normative databases as a quantitative tool for the comparison of macular thickness data to a database of normal subjects.
- Processing of CIRRUS' AngioPlex OCT Angiography data.
- Creating, managing and displaying clinical events.

All instances generated by Retina Workplace are automatically stored in FORUM Archive and made available for other DICOM activities like Storage to a remote AE, Query/Retrieve by a remote AE or export to local storage media.

4.1.3 Sequencing of Real-World Activities

See FORUM DICOM Conformance Statement.

4.1.3.1 Retina Workplace Activities

DICOM EPDF Report Creation

Retina Workplace creates DICOM Encapsulated PDF objects when the user creates a report using the Retina Workplace UI.

4.2 AE Specifications

See FORUM DICOM Conformance Statement.

4.3 Network Interfaces

See FORUM DICOM Conformance Statement.

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

See FORUM DICOM Conformance Statement for AE Title settings (local/remote) settings.

4.4.2 Parameters

4.4.2.1 General Parameters

See FORUM DICOM Conformance Statement.

5 Media Interchange

See FORUM DICOM Conformance Statement.

6 Support of Character Sets

See FORUM DICOM Conformance Statement.

7 Security

See FORUM DICOM Conformance Statement.

8 Annexes

8.1 IOD Contents

8.1.1 Created SOP Instance(s)

Retina Workplace can generate overview and OCT reports that contain analysis results from OCT and registered fundus images.

In case new UIDs are created, they contain a constant prefix as follows:

Study Instance UID: 1.2.276.0.75.2.5.100.25.1

Series Instance UID: 1.2.276.0.75.2.5.100.25.2

SOP Instance UID: 1.2.276.0.75.2.5.100.25.3

Abbreviations used for Presence of Values (PoV):

VNAP
Value Not Always Present (attribute sent zero length if no value is present)

ANAP
Attribute is not always present

ALWAYS
Attribute is always present with a value

EMPTY
Attribute is sent without a value

Abbreviations used for Sources of Data (Source):

USER
The attribute value source is from User input

AUTO
The attribute value is generated automatically

MWL
The attribute value is the same as the value received using a DICOM service such as Modality Worklist.

CONFIG
The attribute value source is a configurable parameter

ACQUISITION
The sources of data come from data acquisition process. Include Image and data relate to Image

ANALYSIS
The sources of data come from data generate by application or add/edit/update by user when images are analyzed.

SRQ
The attribute value is same as the value received using a DICOM service such as Study Root Query.

PRQ
The attribute value is same as the value received using a DICOM service such as Patient Root Query.

8.1.1.1 Encapsulated PDF Information Object Definition

Table 8-1 Encapsulated PDF IOD – Module Overview

IE	Module	Usage
Patient		
	Patient	ALWAYS
	Clinical Trial Subject	NEVER
Study		
	General Study	ALWAYS
	Patient Study	NEVER
	Clinical Trial Study	NEVER
Series		
	Encapsulated Document Series	ALWAYS
	Clinical Trial Series	NEVER
Equipment		
	General Equipment	ALWAYS
	Sc Equipment	ALWAYS
Encapsulated Document		
	Encapsulated Document	ALWAYS
	Sop Common	ALWAYS
	CZM NIM Internal	ALWAYS

Table 8-2 Encapsulated PDF IOD - File Meta Information

Tag	Type	VR	Name	Content (Description)	PoV	Source
(0002,0001)	1	OB	File Meta Information Version	00\01	ALWAYS	AUTO
(0002,0002)	1	UI	Media Storage SOP Class UID	1.2.840.10008.5.1.4.1.1.104.1 (Encapsulated PDF Storage)	ALWAYS	AUTO
(0002,0003)	1	UI	Media Storage SOP Instance UID	The SOP instance UID has a prefix of 1.2.276.0.75.2.5.100.25.3.	ALWAYS	AUTO
(0002,0010)	1	UI	Transfer Syntax UID	1.2.840.10008.1.2.1 (Explicit VR Little Endian)	ALWAYS	AUTO
(0002,0012)	1	UI	Implementation Class UID	1.2.276.0.75.2.5.30	ALWAYS	AUTO
(0002,0013)	3	SH	Implementation Version Name	Version of FORUM, written by FORUM.	ALWAYS	AUTO
(0002,0016)	3	AE	Source Application Entity Title	Generated dynamically	ALWAYS	AUTO

8.1.1.2 Common Modules

No common modules.

8.1.1.3 Encapusulated PDF IOD Modules

Table 8-3 Module "Patient" of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Patient's Name	(0010,0010)	PN	2	Patient's full name from source raw data.	ALWAYS	SRC
Patient ID	(0010,0020)	LO	2	Patient ID from source raw data.	ALWAYS	SRC
Issuer of Patient ID	(0010,0021)	LO	3	Issuer of Patient ID from source raw data.	ANAP	SRC
Patient's Birth Date	(0010,0030)	DA	2	Birth date of the patient from source raw data.	ALWAYS	SRC
Patient's Sex	(0010,0040)	CS	2	Sex of the named patient from source raw data. Enumerated Values: M = male F = female O = other Can be empty if empty in source raw data.	VNAP	SRC
Other Patient IDs	(0010,1000)	LO	3	Other patient IDs from source raw data.	ANAP	SRC
Ethnic Group	(0010,2160)	SH	3	Ethnic group or race of the patient from source raw data.	ANAP	SRC
Patient Comments	(0010,4000)	LT	3	Patient Comments from source raw data.	ANAP	SRC

Table 8-4 Module "General Study" of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Study Instance UID	(0020,000D)	UI	1	Study Instance UID from source raw data for single exam report. For study newly created, a new UID is generated with a UID prefix of 1.2.276.0.75.2.5.100.25.1 A new study is created, if the source of the report contains multiple DICOM instances.	ALWAYS	SRC/ AUTO
Study Date	(0008,0020)	DA	2	Study Date from source raw data for single exam report. Current date in case of multi exam reports.	ALWAYS	SRC/ AUTO
Study Time	(0008,0030)	TM	2	Study Time from source raw data for single exam report. Current time in case of multi exam reports.	ALWAYS	SRC/ AUTO
Referring Physician's Name	(0008,0090)	PN	2	Name of the patient's referring physician from latest source raw data. Can be empty if empty in the source raw data.	VNAP	SRC
Study ID	(0020,0010)	SH	2	Study ID from source raw data. Newly generated if a new study is created.	ALWAYS	SRC/ AUTO
Accession Number	(0008,0050)	SH	2	Accession Number from latest source raw data. Can be empty if empty in the source raw data.	VNAP	SRC

Study Description	(0008,1030)	LO	3	Study Description from source raw data (not in case of overview report). For overview report the attribute contains the name of the analysis displayed in the working area during report creation. Possible values: "Macular Thickness Analysis" or "Macular Change Analysis" or "High Definition Images"	ANAP	SRC/ AUTO
Procedure Code Sequence	(0008,1032)	SQ	3	Procedure Code Sequence from latest source raw data.	ANAP	SRC

Table 8-5 Module "Encapsulated Document Series" of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Modality	(0008,0060)	CS	1	Newly created and set to OPT.	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	1	Newly created series instance UID with root: 1.2.276.0.75.2.5.100.25.2	ALWAYS	AUTO
Series Number	(0020,0011)	IS	1	Newly created and set to "1".	ALWAYS	AUTO
Series Description	(0008,103E)	LO	3	Scan type that was performed. Possible values (except for overview report): "Macular Cube 200x200", "Macular Cube 512x128", "5 Line Raster", "HD 5 Line Raster, "HD Cross", "HD Radial", "HD 21 Line", "HD 1 Line", "Angiography 3x3 mm", "Angiography 6x6 mm", "Angiography 8x8 mm, "Angiography 12x12 mm". For overview report the attribute contains the name of the analysis displayed in the working area during report creation. Possible values: "Macular Thickness Analysis" or "Macular Change Analysis" or "High Definition Images".	ALWAYS	AUTO
Request Attributes Sequence	(0040,0275)	SQ	3	Request Attributes Sequence from latest source raw data. Not available if not present in the source raw data.	ANAP	SRC
Requested Procedure Description	>(0032,1060)	LO	3	Requested Procedure Description from source raw data.	ANAP	SRC
Scheduled Procedure Step ID	>(0040,0009)	SH	1C	Scheduled Procedure Step ID from source raw data.	ANAP	SRC
Scheduled Procedure Step Description	>(0040,0007)	LO	3	Scheduled Procedure Step Description from source raw data.	ANAP	SRC
Scheduled Protocol Code Sequence	>(0040,0008)	SQ	3	Scheduled Protocol Code Sequence from source raw data.	ANAP	SRC
Performed Procedure Step ID	(0040,0253)	SH	3	Performed Procedure Step ID from raw source data.	ANAP	SRC
Performed Procedure Step Start Date	(0040,0244)	DA	3	Performed Procedure Step Start Date from raw source data.	ANAP	SRC

Performed Procedure Step Start Time	(0040,0245)	TM	3	Performed Procedure Step Start Time from raw source data.	ANAP	SRC
Performed Procedure Step Description	(0040,0254)	LO	3	Scan type that was performed. All scan types that are shown on the report are included. Possible scan types are: “Macular Cube 200x200”, “Macular Cube 512x128”, “5 Line Raster”, “HD 5 Line Raster”, “HD Cross”, “HD Radial”, “HD 21 Line”, “HD 1 Line”, “Angiography 3x3 mm”, “Angiography 6x6 mm”, “Angiography 8x8 mm”, “Angiography 12x12mm”. The Angiography scan types cannot be part of an overview report.	ALWAYS	AUTO

Table 8-6 Module “General Equipment” of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Manufacturer	(0008,0070)	LO	2	Set to “Carl Zeiss Meditec”	ALWAYS	AUTO
Institution Name	(0008,0080)	LO	3	Institution Name from FORUM configuration	ANAP	CONFIG
Institution Address	(0008,0081)	ST	3	Institution Address from FORUM configuration	ANAP	CONFIG
Station Name	(0008,1010)	SH	3	Hostname of the machine used for creating the report.(Retina Workplace Server)	ALWAYS	AUTO
Manufacturer's Model Name	(0008,1090)	LO	3	Set to “Retina Workplace”	ALWAYS	AUTO
Software Version(s)	(0018,1020)	LO	3	Multi valued: < Retina Workplace SW version>\<acquisition software version>	ALWAYS	AUTO

Table 8-7 Module “SC Equipment” of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Conversion Type	(0008,0064)	CS	1	Set to: SYN = Synthetic Image	ALWAYS	AUTO
Instance Number	(0020,0013)	IS	1	Set to 1.	ALWAYS	AUTO
Content Date	(0008,0023)	DA	2	Set to current date.	ALWAYS	AUTO
Content Time	(0008,0033)	TM	2	Set to current time.	ALWAYS	AUTO
Acquisition Datetime	(0008,002A)	DT	2	Acquisition Date/Time from raw data exam	VNAP	SRC
Image Laterality	(0020,0062)	CS	3	“R” if all source exams are OD or “L” if all source exams are OS.	ALWAYS	SRC

Burned In Annotation	(0028,0301)	CS	1	Set to “YES”	ALWAYS	AUTO
Source Instance Sequence	(0042,0013)	SQ	1C	Contains the UIDs from all source documents. Minimum one sequence item.	ALWAYS	AUTO
Referenced SOP Class UID	>(0008,1150)	UI	1	SOP Class UID from the source data.	ALWAYS	AUTO
Referenced SOP Instance UID	>(0008,1155)	UI	1	SOP Instance UID from the source data.	ALWAYS	AUTO
Document Title	(0042,0010)	ST	2	The title of the document containing laterality and analysis name following the format: ‹Laterality› + " " + <Analysis Name> Allowed values for Laterality: {"OD" or "OS"} Allowed values for Analysis Name: {"Macular Thickness Analysis", "Macular Change Analysis", "High Definition Images", “En Face Analysis”, “Advanced RPE Analysis”, “Mixed Analysis”, "Angiography Change Analysis" or “Angio Two Visit Comparison”} In an overview report the values are the same, except "Angiography Change Analysis”.	ALWAYS	AUTO
Concept Name Code Sequence	(0040,A043)	SQ	2	This sequence is always empty.	EMPTY	
MIME Type of Encapsulated Document	(0042,0012)	LO	1	Set to “application/pdf”	ALWAYS	AUTO
Encapsulated Document	(0042,0011)	OB	1	Encapsulated Document stream, containing the pdf report.	ALWAYS	ANALYSIS

Table 8-8 Module “SOP Common” of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
SOP Class UID	(0008,0016)	UI	1	Set to: “1.2.840.10008.5.1.4.1.1.104.1”	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	1	Newly created with root: 1.2.276.0.75.2.5.100.25.3	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	1C	Set to: “ISO_IR 192” (UTF-8 encoded Unicode)	ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA	3	Current date.	ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM	3	Current time	ALWAYS	AUTO
Contributing Equipment Sequence	(0018,A001)	SQ	3	Contains information about the equipment used to create the source data shown in the report.	ANAP	SRC

Purpose of Reference Code Sequence	>(0040,A170)	SQ	1	Set to: “109101”, “DCM”, “Acquisition Equipment”	ALWAYS	AUTO
Manufacturer	>(0008,0070)	LO	1	Manufacturer of the equipment that contributed to the composite instance.	ALWAYS	SRC
Institution Name	>(0008,0080)	LO	3	Institution where the equipment that contributed to the composite instance is located.	ANAP	SRC
Institution Address	>(0008,0081)	ST	3	Address of the institution where the equipment that contributed to the composite instance is located.	ANAP	SRC
Station Name	>(0008,1010)	SH	3	User defined name identifying the machine that contributed to the composite instance.	ANAP	SRC
Manufacturer's Model Name	>(0008,1090)	LO	3	Manufacturer’s model name of the equipment that contributed to the composite instance.	ANAP	SRC
Device Serial Number	>(0018,1000)	LO	3	Manufacturer’s serial number of the equipment that contributed to the composite instance.	ANAP	SRC
Software Version(s)	>(0018,1020)	LO	3	Manufacturer’s designation of the software version of the equipment that contributed to the composite instance.	ANAP	SRC
Date of Last Calibration	>(0018,1200)	DA	3	Date when the image acquisition device calibration was last changed in any way.	ANAP	SRC

Table 8-9 Module “SOP Common” of Created Encapsulated PDF SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
IOD name meta info	(2201,1000)	LT	1	Name of the Information Object Definition as specified by CZM-XML.	ALWAYS	AUTO
CZM-XML Version	(2201,1001)	LT	1	Version of the CZM-XML used to create this IOD.	ALWAYS	AUTO

8.1.1.4 Raw Data Information Object Definition

Table 8-10 RAW IOD – Module Overview

IE	Module	Usage
Patient		
	Patient	ALWAYS
Study		
	General Study	ALWAYS
Series		
	General Series	ALWAYS
Equipment		
	General Equipment	ALWAYS
Raw Data		
	Acquisition Context	ALWAYS
	Raw Data	
	Sop Common	ALWAYS
	CZM NIM Internal	ALWAYS

8.1.1.5 Raw Data IOD Modules

Table 8-11 Module "Patient" of Created Raw Data SOP Instances

Attriubte Name	Tag	VR	Type	Description	PoV	Source
Patient's Name	(0010,0010)	PN	2	Patient's full name from FORUM.	ALWAYS	SRC
Patient ID	(0010,0020)	LO	2	Patient ID from FORUM.	ALWAYS	SRC
Issuer of Patient ID	(0010,0021)	LO	3	Issuer of patient id from FORUM.	ANAP	SRC
Patient's Birth Date	(0010,0030)	DA	2	Birth date of the patient.	VNAP	SRC
Patient's Sex	(0010,0040)	CS	2	Sex of the patient. Enumerated Values: M = male F = female O = other	VNAP	SRC

Table 8-12 Module "General Study" of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Study Instance UID	(0020,000D)	UI	1	A new UID is generated with a UID prefix of 1.2.276.0.75.2.5.100.25.1	ALWAYS	AUTO
Study Date	(0008,0020)	DA	2	Date the event was created. Current date.	ALWAYS	AUTO
Study Time	(0008,0030)	TM	2	Time the event was created. Current time.	ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN	2	Information not available for clinical events.	EMPTY	

Study ID	(0020,0010)	SH	2	A newly generated Study identifier-	ALWAYS	AUTO
Accession Number	(0008,0050)	SH	2	No accession number available for a clinical event. (clinical events are unscheduled cases)	EMPTY	
Study Description	(0008,1030)	LO	3	“clinical event”	ALWAYS	AUTO

Table 8-13 Module “General Series” of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Modality	(0008,0060)	CS	1	Set to “DOC”.	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	1	Newly created series instance UID with root: 1.2.276.0.75.2.5.100.25.2	ALWAYS	AUTO
Series Number	(0020,0011)	IS	2	“1”	ALWAYS	AUTO
Series Date	(0008,0021)	DA	3	Date the event was created. Current date.	ALWAYS	AUTO
Series Time	(0008,0031)	TM	3	Time the event was created. Current time.	ALWAYS	AUTO
Series Description	(0008,103E)	LO	3	“clinical event”	ALWAYS	AUTO

Table 8-14 Module “General Equipment” of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Manufacturer	(0008,0070)	LO	2	Set to “Carl Zeiss Meditec”	ALWAYS	AUTO
Institution Name	(0008,0080)	LO	3	Institution from FORUM configuration	ANAP	CONFIG
Institution Address	(0008,0081)	ST	3	Institution from FORUM configuration	ANAP	CONFIG
Station Name	(0008,1010)	SH	3	Hostname of the machine used for creating the clinical event.(FORUM plugin Server)	ALWAYS	AUTO
Manufacturer's Model Name	(0008,1090)	LO	3	Set to: “Retina Workplace”	ALWAYS	AUTO
Software Version(s)	(0018,1020)	LO	3	Multi valued 1. Retina Workplace version.	ALWAYS	AUTO

Table 8-15 Module “Acquisition Context” of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Acquisition Context Sequence	(0040,0555)	SQ	2	Empty, no acquisition done for the creation of clinical events.	EMPTY	

Table 8-16 Module “Raw Data” of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
Instance Number	(0020,0013)	IS	2	“1”	ALWAYS	AUTO
Content Date	(0008,0023)	DA	1	Current date.	ALWAYS	AUTO
Content Time	(0008,0033)	TM	1	Current time.	ALWAYS	AUTO

Acquisition Datetime	(0008,002A)	DT	3	Current date and time.	ALWAYS	AUTO
Image Laterality	(0020,0062)	CS	3	Laterality of the clinical event. e. g. left for an event like surgery left eye. Enumerated Values: R = right L = left U = unpaired B = both left and right	ALWAYS	USER
Creator-Version UID	(0008,9123)	UI	1	Set to 1.2.276.0.75.2.5.100.25.6.< Retina Workplace version >	ALWAYS	AUTO
Referenced Instance Sequence	(0008,114A)	SQ	3	Contains the predecessor of a clinical event in case of a changed or deleted event. Used to mark changes of an event, or that the event is deleted. Not present for the initial version of a clinical event.	ANAP	AUTO
Referenced SOP Class UID	>(0008,1150)	UI	1	SOP Class of the referenced clinical event, "1.2.840.10008.5.1.4.1.1.66"	ALWAYS	AUTO
Referenced SOP Instance UID	>(0008,1155)	UI	1	The UID of the instance containing the previous state of the clinical event. The event that was changed or deleted.	ALWAYS	AUTO
Purpose of Reference Code Sequence	>(0040,A170)	SQ	1	Describes the purpose for which the reference is made. Only a single Item shall be included in this sequence. Contains the action that was performed with the linked clinical event. Contains values for “Changed” and “Deleted”.	ALWAYS	AUTO
>> Include ‚Code Sequence Macro‘				(EVENT_CHANGED, 99CZM, “CZM clinical event changed“) or (EVENT_DELETED, 99CZM, “CZM clinical event deleted“)		

Table 8-17 Module “SOP Common” of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
SOP Class UID	(0008,0016)	UI	1	Set to Raw Data Storage "1.2.840.10008.5.1.4.1.1.66"	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	1	Newly created with UID prefix of: 1.2.276.0.75.2.5.100.25.3	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	1C	Set to: “ISO_IR 192” (Unicode encoding)	ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA	3	Date the SOP Instance was created. Current date.	ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM	3	Time the SOP Instance was created. Current time.	ALWAYS	AUTO

Table 8-18 Module “CZM NIM Internal” of Created Raw Data SOP Instances

Attribute Name	Tag	VR	Type	Description	PoV	Source
IOD name meta info	(2201,1000)	LT	1	Name of the Information Object Definition as specified by CZM-XML.	ALWAYS	AUTO

CZM-XML Version	(2201,1001)	LT	1	Version of the CZM-XML used to create this IOD.	ALWAYS	AUTO
Private module names and versions	(2201,1002)	LT	3	Names and versions of the private modules used in this IOD.	ALWAYS	AUTO

8.1.2 Usage of Attributes from Received IOD's

See FORUM DICOM Conformance Statement.

8.1.3 Attribute Mapping

See FORUM DICOM Conformance Statement for FORUM generated DICOM objects.

Table 8-19 Attribute Mapping from Source Raw Data IOD into Retina Workplace generated Encapsulated PDF IODs

Source Raw Data IOD	Encapsulated PDF IOD	Editable
Study Instance UID	Study Instance UID [1)]	No
Study Date	Study Date [1)]	No
Study Time	Study Time [1)]	No
Study ID	Study ID [1)]	No
Study Description	Study Description [1)]	No
Accession Number	Accession Number[2)]	No
Procedure Code Sequence	Procedure Code Sequence[2)]	No
Request Attributes Sequence > Requested Procedure ID	Request Attributes Sequence[2)] > Requested Procedure ID	No
Request Attributes Sequence > Requested Procedure Description	Request Attributes Sequence > Requested Procedure Description	No
Request Attributes Sequence > Scheduled Procedure Step Description	Request Attributes Sequence > Scheduled Procedure Step Description	No
Request Attributes Sequence > Scheduled Procedure Step ID	Request Attributes Sequence > Scheduled Procedure Step ID	No
Request Attributes Sequence > Scheduled Protocol Code Sequence	Request Attributes Sequence > Scheduled Protocol Code Sequence	No
Performed Procedure Step ID	Performed Procedure Step ID [2)]	No
Performed Procedure Step Start Date	Performed Procedure Step Start Date [2)]	No
Performed Procedure Step Start Time	Performed Procedure Step Start Time [2)]	No
Laterality	Laterality	No
Acquisition Date Time	Acquisition Date Time [2)]	No
Image Laterality	Image Laterality	No
Referring Physicians Name	Referring Physicians Name[2)]	No
Patients Name	Patients Name	No
Patient ID	Patient ID	No
Issuer of Patient ID	Issuer of Patient ID	No
Other Patient IDs	Other Patient IDs	No
Patients Birth Date	Patients Birth Date	No
Patients Sex	Patients Sex	No
Patient Comments	Patient Comments	No
Ethnic Group	Ethnic Group	No

1) Only applies when the source is a single raw data object. In case of multiple source raw data sets the values in the resulting ePDF IODs are newly generated and not mapped from the source.

2) Copied from latest source raw data set.

8.1.4 Coerced/Modified Fields

See FORUM DICOM Conformance Statement.

8.2 Data Dictionary of Private Attributes

Table 8-20 Private Dictionary Group (2201,00xx) = "99CZM_NIM_INTERNAL_01"

Occurs in: all instances generated by Retina Workplace

Tag	Attribute Name	VR	VM
(2201,00xx)	Private Creator	LO	1
(2201,xx00)	iod_name_meta_info	LT	1
(2201,xx01)	czm_xml_version	LT	1
(2201,xx02)	private_module_names_and_versions	LT	1

8.3 Coded Terminology and Templates

Retina Workplace uses (0040,A170) Purpose of Reference Code Sequence with following codes to track the history of a clinical event.

Occurs in: Raw Data IOD

Table 8-21 Purpose of Reference Code Sequence

Code Value	Coding Scheme Designator	Code Meaning
EVENT_CHANGED	99CZM	"CZM clinical event changed "
EVENT_DELETED	99CZM	"CZM clinical event deleted"

8.3.1 Context Groups

N/A as no Context Groups are used.

8.3.2 Template Specifications

N/A as no extensions to standard templates or private templates are used.

8.3.3 Private Code Definitions

N/A as no private codes are used.

8.4 Greyscale Image Consistency

N/A as the DICOM Grayscale Standard Display Function is not supported.

8.5 Standard Extended / Specialized/ Private SOP Classes

The following standard extensions are used in the IODs described in chapter 8.1.1 Created SOP Instance(s):

- Encapsulated PDF IOD – Module "CZM NIM Internal"
- Raw Data IOD – Module "CZM NIM Internal"

8.6 Private Transfer Syntaxes

N/A as no Private Transfer Syntax is supported.

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