5

**Digital Imaging and Communications in Medicine (DICOM)**


*Supplement 247: Eyecare Measurement Templates*

10

**Table of Contents**

50

# Document History

| Document Version | Date | Content |
|---|---|---|
| 01 | 11-Oct-24 | Initial Draft for discussion at WG-9 |
| 02 | 4-Nov-24 | First reading at WG-06 |

# Scope and Field of Application

This Supplement proposes to add templates, context groups, and coded vocabulary for eyecare measurements to the Standard. These templates may be used in either SR documents, or for structured content in an
55 Encapsulated PDF object.

While DICOM has standardized the ophthalmic image formats, it has not yet standardized the measurements derived from those images.

Note that there are several existing IODs that record measurements directly produced by various refractive devices that do not produce images (autorefraction, lensometry, keratometry, etc.). The measurements of this
60 Supplement are instead derived from analysis of images, typically retinal optical coherence tomography images.

The IHE Eyecare domain had defined (as a draft for trial implementation) templates, context groups, and coded vocabulary for various key measurements in ophthalmology. WG-09 has determined that those should be formalized in the DICOM Standard.

Some vocabulary may be submitted to LOINC for assignment of codes.

65

# Open Issues for Public Comment

|  | Structured as single type "Ophthalmology Note" with as many optional sections as desired. Each section conveys measurements for one eye only. A single note type, defined in LOINC, supports EHR handling. Is this acceptable to vendors? |
|---|---|
|  | Should the Macular Grid Thickness and Volume Report be retired and incorporated into the Ophthalmic Note? There are no known implementations. |
|  | Should the Ophthalmology Note be a separate SOP Class, as was Macular Grid Thickness and Volume Report? |
|  | Should measurements be precoordinated with laterality? (LOINC Panel for RNFL does, panel for Macular Grid does not) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

*New templates for PS3.16 Annex A*

70

## TID 60x0 Ophthalmology Key Measurement Note

Type:    Extensible
Order:   Non-Significant
75  Root:    Yes

**Table TID 60x0 Ophthalmology Key Measurement Note**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | CODE | EV (34808-6, LN, "Ophthalmology Note") | 1 | M | | |
| 2 | > | HAS CONCEPT MOD | INCLUDE | DTID 1204 "Language of Content Item and Descendants" | 1 | U | | |
| 3 | > | HAS OBS CONTEXT | INCLUDE | DTID 1002 "Observer Context" | 1-n | U | | |
| 5 | > | CONTAINS | INCLUDE | DTID 60x2 Visual Field Key Measurements | 1-n | U | | |
| 6 | > | CONTAINS | INCLUDE | DTID 60x3 OCT Optic Disc Key Measurements | 1-n | U | | |
| 7 | > | CONTAINS | INCLUDE | DTID 60x4 OCT RNFL Key Measurements | 1-n | U | | |
| 8 | > | CONTAINS | INCLUDE | DTID 60x5 OCT Macula Thickness Key Measurements | 1-n | U | | |
| 9 | > | CONTAINS | INCLUDE | DTID 60x6 OCT GCL Key Measurements | 1-n | U | | |
| 10 | > | CONTAINS | INCLUDE | DTID 60x7 Corneal Topography Key Measurements | 1-n | U | | |
| 11 | > | CONTAINS | INCLUDE | DTID 60x8 Endothelial Cell Count Key Measurements | 1-n | U | | |
| 12 | > | CONTAINS | INCLUDE | DTID 60x9 Ophthalmic Image ROI Measurements | 1-n | U | | |

80 **TID 60x1 Ophthalmology Measurements Section Context**

Type:     Extensible
Order:    Significant
Root:     No

85                     **Table TID 60x1 Ophthalmology Measurements Section Context**

|  | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
|  |  | HAS OBS CONTEXT | CODE | EV (363698007, SCT, "Finding Site") | 1 | M |  | EV (81745001, SCT, "Eye") |
|  | > | HAS CONCEPT MOD | CODE | EV (272741003, SCT, "Laterality") | 1 | M |  | DCID 247 "Laterality Left-Right Only" |
|  |  | HAS OBS CONTEXT | INCLUDE | DTID 4019 Algorithm Identification | 1 | U |  |  |
|  |  | HAS OBS CONTEXT | IMAGE | EV (121112, DCM, "Source of Measurement") | 1-n | U |  |  |
|  |  | HAS OBS CONTEXT | CODE | EV (370129005, SCT, "Measurement Method") | 1 | U |  | EV (400110, 99??, "Repositioned ROI or grid") |
|  |  | CONTAINS | NUM | EV (111694, DCM, "Image Set Quality Rating") | 1 | U |  | UNITS = EV ({0:100}, UCUM, "range:0:100") Value = 0 - 100 |
|  |  | CONTAINS | NUM | EV (111029, DCM, "Image Quality Rating") | 1-n | U |  | UNITS = EV ({0:100}, UCUM, "range:0:100") Value = 0 - 100 |
|  | > | INFERRED FROM | IMAGE |  | 1 | M |  |  |
|  |  | CONTAINS | CODE | EV (111101, DCM, "Image Quality") | 1 | U |  | BCID 3114 Study Quality |
|  |  | CONTAINS | NUM | EV (111693, DCM, "Analysis Quality Rating") | 1 | M |  | UNITS = EV ({0:100}, UCUM, "range:0:100") VALUE = 0 - 100 |
|  |  | CONTAINS | IMAGE | EV (125201, DCM, "Illustration of Finding") | 1 | U |  |  |
|  |  | CONTAINS | COMPOSITE | EV (125201, DCM, "Illustration of Finding") | 1 | U |  |  |
|  |  | CONTAINS | TEXT | EV (121106, DCM, "Comment") | 1 | U |  |  |

| 17 | > | CONTAINS | NUM | EV (111693, DCM, "Analysis Quality Rating") | 1 | M | UNITS = EV ({0:100}, UCUM, "range:0:100") Value = 0 - 100 |
| 18 | >> | HAS OBS CONTEXT | INCLUDE | DTID 2102 "Quality Rating Identification" | 1 | M | |
| 19 | > | CONTAINS | NUM | EV (111694, DCM, "Image Set Quality Rating") | 1 | M | UNITS = EV ({0:100}, UCUM, "range:0:100") Value = 0 - 100 |
| 20 | >> | HAS OBS CONTEXT | INCLUDE | DTID 2102 "Quality Rating Identification" | 1 | M | |
| 21 | > | CONTAINS | NUM | EV (111029, DCM, "Image Quality Rating") | 1-n | U | UNITS = EV ({0:100}, UCUM, "range:0:100") Value = 0 - 100 |
| 22 | >> | INFERRED FROM | IMAGE | | 1 | M | |
| 23 | >> | HAS OBS CONTEXT | INCLUDE | DTID 2102 "Quality Rating Identification" | 1 | M | |

**Commented [HS1]:** From TID 2101 - do we need to identify a different algorithm here

90 **TID 60x2 Visual Field Key Measurements**

Type:    Extensible
Order:   Significant
Root:    No

95                     **Table TID 60x2 Visual Field Key Measurements**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | CONTAINER | EV(400100, 9??, "Visual Field Key Measurements") | 1 | M | | |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M | | |
| 3 | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M | | $Measurement = DCID 42x1 Visual Field Measurements<br>$Method = DCID 4250. Visual Field Static Perimetry Test Pattern |
| 4 | > | CONTAINS | CODE | EV (111855, DCM, "Glaucoma Hemifield Test Analysis ") | 1 | U | | DCID 4254. Visual Field Static Perimetry Test Analysis Result |
| 5 | > | CONTAINS | TEXT | EV (400204, 99?, "Fixation losses ratio") | 1 | U | | Text string in the form of "number of fixation loss responses/number of trials" |
| 6 | > | CONTAINS | TEXT | EV (400205, 99?, "Fixation positive ratio") | 1 | U | | Text string in the form of "number of false positive responses/number of trials" |
| 7 | > | CONTAINS | TEXT | EV (400206, 99?, "Fixation negative ratio") | 1 | U | | Text string in the form of "number of false negative responses/number of trials" |

100 **TID 60x3 OCT Optic Disc Key Measurements**

Type:    Extensible
Order:   Significant
Root:    No

105

**Table TID 60x3 OCT Optic Disc Key Measurements**

|  | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 |  |  | CONTAINER | EV(400101, 99??, "OCT Optic Disc Key Measurements") | 1 |  |  |  |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M |  |  |
|  | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M |  | $Measurement = DCID 42x2 OCT Optic Disc Measurements |

## TID 60x4 OCT RNFL Key Measurement Report

110 Type: Extensible
Order: Significant
Root: Nₒ

**Table TID 60x4 OCT RNFL Key Measurements**

|  | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 |  | CONTAINS | CONTAINER | EV(400102, 99??, "OCT RNFL Key Measurements") | 1 |  |  |  |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M |  |  |
|  | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M |  | $Measurement = DCID 42x3 OCT RNFL Measurements |

115

## TID 60x5 OCT Macula Thickness Key Measurements

Type:    Extensible
120  Order:   Significant
Root:    No

**Table TID 60x5 OCT Macula Thickness Key Measurements**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | CONTAINS | CONTAINER | EV(400103, 99??, "OCT Macula Thickness Key Measurements") | 1 | | | |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M | | |
| | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M | | $Measurement = DCID 42x4 OCT Macula Thickness Measurements |
| | > | CONTAINS | NUM | EV (111691, DCM, "Number of Images Used for Macular Measurements") | 1 | M | | UNITS = EV ({images}, UCUM, "images") |
| | > | CONTAINS | NUM | EV (111692, DCM, "Number of Samples Used per Image") | 1 | M | | UNITS = EV ({samples}, UCUM, "samples") |
| | > | CONTAINS | CODE | EV (111696, DCM, "Visual Fixation Quality During Acquisition") | 1 | U | | DCID 4220 "Visual Fixation Quality During Acquisition" |
| | >> | HAS CONCEPT MOD | CODE | EV (111697, DCM, "Visual Fixation Quality Problem") | 1-n | U | | DCID 4221 "Visual Fixation Quality Problem" |
| | > | CONTAINS | CODE | EV (111698, DCM, "Ophthalmic Macular Grid Problem") | 1-n | U | | DCID 4222 "Ophthalmic Macular Grid Problem" |

125  .

## TID 60x6 OCT GCL Measurements

Type:    Extensible
Order:   Significant
Root:    No

130

**Table TID 60x6 OCT GCL Key Measurements**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| | | CONTAINS | CONTAINER | EV(400104, 99??, "OCT GCL Key Measurements") | 1 | | | |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M | | |
| 1 | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M | | $Measurement = DCID 42x5 OCT GCL Measurements |

135 **TID 60x7 Corneal Topography Key Measurements**

Type:   Extensible
Order:  Significant
Root:   No

140 **Table TID 60x7 Corneal Topography Key Measurements**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| | | CONTAINS | CONTAINER | EV (400105, 99??, "Corneal Topography Key Measurements") | 1 | | | |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M | | |
| 3 | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M | | $Measurement = DCID 42x6 Corneal Topography Measurements |

**TID 60x8 Endothelial Cell Count Key Measurements**

Type:   Extensible
145 Order:  Significant
Root:   No

**Table TID 60x8 Endothelial Cell Count**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | CONTAINS | CONTAINER | EV(400106, 99??, "Endothelial Cell Count Key Measurements") | 1 | | | |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M | | |
| | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M | | $Measurement = DCID 42x7 Endothelial Cell Count Measurements |

150

## TID 60x9 Ophthalmic Image ROI Measurements

Type: Extensible
Order: Significant
155 Root: No

**Table TID 60x9 Ophthalmic Image ROI Measurements**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | CONTAINS | CONTAINER | EV(400107, 99??, "Ophthalmic Image ROI Measurements") | 1 | | | |
| 2 | > | CONTAINS | INCLUDE | DTID 60x1 "Ophthalmology Measurements Section Context" | 1 | M | | |
| | > | CONTAINS | INCLUDE | DTID 1501 "Measurement and Qualitative Evaluation Group" | 1-n | M | | $Measurement = |

160 | *New context groups for PS3.16 Annex B*

## CID 42x1 Visual Field Measurements

Keyword:  VisualFieldMeasurements
165  FHIR Keyword: dicom-cid-42x1-VisualFieldMeasurements
Type:    Extensible
Version:    2025mmdd
UID: 1.2.840.10008.6.1.x

170                          **Table CID 42x1  Visual Field Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|---|---|---|---|
| 99? | 400200 | Mean Deviation | (dB, UCUM, "dB") |
| 99? | 400201 | Pattern Standard Deviation | (dB, UCUM, "dB") |
| DCM | 111852 | Visual Field Index | (%, UCUM, "%") |
| 99? | 400202 | False positive percent | (%, UCUM, "%") |
| 99? | 400203 | False negative percent | (%, UCUM, "%") |

## CID 42x2 OCT Optic Disc Measurements

175  Keyword:  OCTOpticDiscMeasurements
FHIR Keyword: dicom-cid-42x2-OCTOpticDiscMeasurements
Type:    Extensible
Version:    2025mmdd
UID: 1.2.840.10008.6.1.x
180

                          **Table CID 42x2 OCT Optic Disc Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|---|---|---|---|
| 99? | 400300 | Cup to disc area ratio | ({ratio}, UCUM, "ratio") |
| 99? | 400301 | Cup to disk ratio vertical | ({ratio}, UCUM, "ratio") |
| 99? | 400302 | Cup to disk ratio horizontal | ({ratio}, UCUM, "ratio") |
| 99? | 400303 | Optic disc rim area | (mm2, UCUM, "mm2") |
| 99? | 400304 | Optic disc cup area | (mm2, UCUM, "mm2") |
| 99? | 400305 | Optic disc area | (mm2, UCUM, "mm2") |

## CID 42x3 OCT RNFL Measurements

185

Keyword:  OCTRNFLMeasurements
FHIR Keyword: dicom-cid-42x3-OCTRNFLMeasurements
Type:    Extensible
Version:    2025mmdd
190  UID: 1.2.840.10008.6.1.x

**Table CID 42x3 OCT RNFL Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|---|---|---|---|
| 99? | 400400 | Retinal nerve fiber layer average thickness | (um, UCUM, "um") |
| 99? | 400401 | Retinal nerve fiber layer inferior thickness | (um, UCUM, "um") |
| 99? | 400402 | Retinal nerve fiber layer superior thickness | (um, UCUM, "um") |
| 99? | 400403 | Retinal nerve fiber layer temporal thickness | (um, UCUM, "um") |
| 99? | 400404 | Retinal nerve fiber layer nasal thickness | (um, UCUM, "um") |
| 99? | 400405 | Retinal nerve fiber layer symmetry | (%, UCUM, "%") |
| DCM | 111926 | Ganglion cell complex thickness | (um, UCUM, "um") |
| | | Scan radius | |

195  ==LOINC Panel 86291-2 Retina Retinal nerve fiber layer panel by OCT precoordinates laterality==

| | | |
|---|---|---|
| 86283-9 | Right retina Retinal nerve fiber layer.inferior thickness by OCT | um |
| 86288-8 | Left retina Retinal nerve fiber layer.inferior thickness by OCT | um |
| 86290-4 | Left retina Retinal nerve fiber layer.mean thickness by OCT | um |
| 86301-9 | Right retina Retinal nerve fiber layer.mean thickness by OCT | um |
| 86279-7 | Left retina Retinal nerve fiber layer.nasal thickness by OCT | um |
| 86284-7 | Right retina Retinal nerve fiber layer.nasal thickness by OCT | um |
| 86276-3 | Right retina Retinal nerve fiber layer.superior thickness by OCT | um |
| 86277-1 | Left retina Retinal nerve fiber layer.superior thickness by OCT | um |
| 86273-0 | Right retina Retinal nerve fiber layer.temporal thickness by OCT | um |
| 86278-9 | Left retina Retinal nerve fiber layer.temporal thickness by OCT | um |
| 86293-8 | Left retina Retinal nerve fiber layer.clock hour 1 thickness by OCT | um |
| 86305-0 | Right retina Retinal nerve fiber layer.clock hour 1 thickness by OCT | um |
| 86294-6 | Left retina Retinal nerve fiber layer.clock hour 2 thickness by OCT | um |
| 86306-8 | Right retina Retinal nerve fiber layer.clock hour 2 thickness by OCT | um |
| 86295-3 | Left retina Retinal nerve fiber layer.clock hour 3 thickness by OCT | um |
| 86307-6 | Right retina Retinal nerve fiber layer.clock hour 3 thickness by OCT | um |
| 86296-1 | Left retina Retinal nerve fiber layer.clock hour 4 thickness by OCT | um |
| 86308-4 | Right retina Retinal nerve fiber layer.clock hour 4 thickness by OCT | um |
| 86297-9 | Left retina Retinal nerve fiber layer.clock hour 5 thickness by OCT | um |
| 86309-2 | Right retina Retinal nerve fiber layer.clock hour 5 thickness by OCT | um |

| 86298-7 | Left retina Retinal nerve fiber layer.clock hour 6 thickness by OCT | um |
|---------|---------------------------------------------------------------------|-----|
| 86310-0 | Right retina Retinal nerve fiber layer.clock hour 6 thickness by OCT | um |
| 86299-5 | Left retina Retinal nerve fiber layer.clock hour 7 thickness by OCT | um |
| 86311-8 | Right retina Retinal nerve fiber layer.clock hour 7 thickness by OCT | um |
| 86300-1 | Left retina Retinal nerve fiber layer.clock hour 8 thickness by OCT | um |
| 86312-6 | Right retina Retinal nerve fiber layer.clock hour 8 thickness by OCT | um |
| 86286-2 | Left retina Retinal nerve fiber layer.clock hour 9 thickness by OCT | um |
| 86313-4 | Right retina Retinal nerve fiber layer.clock hour 9 thickness by OCT | um |
| 86302-7 | Left retina Retinal nerve fiber layer.clock hour 10 thickness by OCT | um |
| 86314-2 | Right retina Retinal nerve fiber layer.clock hour 10 thickness by OCT | um |
| 86303-5 | Left retina Retinal nerve fiber layer.clock hour 11 thickness by OCT | um |
| 86315-9 | Right retina Retinal nerve fiber layer.clock hour 11 thickness by OCT | um |
| 86304-3 | Right retina Retinal nerve fiber layer.clock hour 12 thickness by OCT | um |
| 86292-0 | Left retina Retinal nerve fiber layer.clock hour 12 thickness by OCT | um |

## CID 42x4 OCT Macula Thickness Measurements

200 Keyword:  OCTMaculaThicknessMeasurements
FHIR Keyword:  dicom-cid-42x4-OCTMaculaThicknessMeasurements
Type:   Extensible
Version:   2025mmdd
UID: 1.2.840.10008.6.1.x
205
See LOINC panel 57119-0 Optical coherence tomography panel

**Table CID 42x4 OCT Macula Thickness Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|--------------------------|------------|--------------|------------------|
| LN | 57108-3 | Macular grid.center point thickness by OCT | um |
| LN | 57109-1 | Macular grid.center subfield thickness by OCT | um |
| LN | 57110-9 | Macular grid.inner superior subfield thickness by OCT | um |
| LN | 57111-7 | Macular grid.inner nasal subfield thickness by OCT | um |
| LN | 57112-5 | Macular grid.inner inferior subfield thickness by OCT | um |
| LN | 57113-3 | Macular grid.inner temporal subfield thickness by OCT | um |
| LN | 57114-1 | Macular grid.outer superior subfield thickness by OCT | um |
| LN | 57115-8 | Macular grid.outer nasal subfield thickness by OCT | um |
| LN | 57116-6 | Macular grid.outer inferior subfield thickness by OCT | um |
| LN | 57117-4 | Macular grid.outer temporal subfield thickness by OCT | um |
| LN | 57118-2 | Macular grid.total volume by OCT | uL |
|    |         | Average macular thickness |    |

210

## CID 42x5 OCT GCL Measurements

Keyword:  OCTGCLMeasurements
215  FHIR Keyword: dicom-cid-42x5-OCTGCLMeasurements
Type:   Extensible
Version:   2025mmdd
UID: 1.2.840.10008.6.1.x

220                              **Table CID 42x5 OCT GCL Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|---|---|---|---|
| 99? | 400500 | Average GCL-IPL thickness | (um, UCUM, "um") |
| 99? | 400501 | Average GCL-IPL thickness superior hemifield | (um, UCUM, "um") |
| 99? | 400502 | Average GCL-IPL thickness inferior hemifield | (um, UCUM, "um") |
| 99? | 400503 | Average GCL-IPL thickness nasal hemifield | (um, UCUM, "um") |
| 99? | 400504 | Average GCL-IPL thickness temporal hemifield | (um, UCUM, "um") |

## CID 42x6 Corneal Topography Measurements

225  Keyword:  CornealTopographyMeasurements
FHIR Keyword:  dicom-cid-42x5-CornealTopographyMeasurements
Type:   Extensible
Version:   2025mmdd
UID: 1.2.840.10008.6.1.x

230
**Table CID 42x6 Corneal Topography Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|---|---|---|---|
| 99? | 400600 | Central keratometry minimum power | ([diop], UCUM, "diopters") |
| 99? | 400601 | Central keratometry minimum radius of curvature | (mm, UCUM, "mm") |
| 99? | 400602 | Central keratometry minimum power axis | (deg, UCUM, "degrees") |
| 99? | 400603 | Central keratometry maximum power | ([diop], UCUM, "diopters") |
| 99? | 400604 | Central keratometry maximum radius of curvature | (mm, UCUM, "mm") |
| 99? | 400605 | Central keratometry maximum power axis | (deg, UCUM, "degrees") |
| 99? | 400606 | Minimum corneal thickness | (um, UCUM, "um") |

Excerpt from LOINC Panel 79897-5 Eye Physical findings panel

| LN | 79740-7 | Right cornea Horizontal diameter | mm |
|---|---|---|---|
| LN | 79739-9 | Left cornea Horizontal diameter | mm |

| LN | 79762-1 | Right cornea Vertical diameter | mm |
|----|---------|--------------------------------|-----|
| LN | 79763-9 | Left cornea Vertical diameter | mm |
| LN | 79825-6 | Right cornea Central corneal thickness Pachymetry | um |
| LN | 79826-4 | Left cornea Central corneal thickness Pachymetry | um |
| LN | 79813-2 | Right cornea Corneal curvature by Keratometry | [diop] |
| LN | 79814-0 | Left cornea Corneal curvature by Keratometry | [diop] |

235

## CID 42x7 Endothelial Cell Count Measurements

Keyword:  EndothelialCellCountMeasurements
FHIR Keyword: dicom-cid-42x7-EndothelialCellCountMeasurements
240 Type:    Extensible
Version:    2025mmdd
UID: 1.2.840.10008.6.1.x

**Table CID 42x7 Endothelial Cell Count Measurements**

| Coding Scheme Designator | Code Value | Code Meaning | Units of Measure |
|--------------------------|------------|--------------|------------------|
| 99? | 400700 | Endothelial cell density | ({cells}/mm2, UCUM, "cells/mm2") |

245

## CID 222 Normality Codes

.
250

**Table CID 222 Normality Codes**

| Coding Scheme Designator | Code Value | Code Meaning | SNOMED-RT Concept ID |
|--------------------------|------------|--------------|----------------------|
| SCT | 17621005 | Normal | G-A460 |
| SCT | 263654008 | Abnormal | R-42037 |
| SCT | 371879000 | Abnormally High | R-002C4 |
| SCT | 371880002 | Abnormally Low | R-002C5 |
| SCT | 82334004 | Normality Undetermined | G-A385 |
| **Include DICOM CID 4254. Visual Field Static Perimetry Test Analysis Results** | | | |
| **SCT** | **394844007** | **Outside reference range** | |
| **SCT** | **281302008** | **Above reference range** | |
| **SCT** | **281300000** | **Below reference range** | |
| **SCT** | **281301001** | **Within reference range** | |
| **SCT** | **442777001** | **Borderline high** | |
| **SCT** | **442779003** | **Borderline low** | |
| **SCT** | **371917008** | **One standard deviation above mean** | |
| **SCT** | **371919006** | **One standard deviation below mean** | |

| Coding Scheme Designator | Code Value | Code Meaning | SNOMED-RT Concept ID |
|---|---|---|---|
| **SCT** | **371920000** | **Two standard deviations above mean** | |
| **SCT** | **371918003** | **Two standard deviations below mean** | |

255

| Code Value | Code Meaning | Definition |
|---|---|---|
| 400100 | Visual Field Key Measurements | Visual Field Key Measurements |
| 400101 | OCT Optic Disc Key Measurements | OCT Optic Disc Key Measurements |
| 400102 | OCT RNFL Key Measurements | OCT RNFL Key Measurements |
| 400103 | OCT Macula Thickness Key Measurements | OCT Macula Thickness Key Measurements |
| 400104 | OCT GCL Key Measurements | OCT GCL Key Measurements |
| 400105 | Corneal Topography Key Measurements | Corneal Topography Key Measurements |
| 400106 | Endothelial Cell Count Key Measurements | Endothelial Cell Count Key Measurements |
| 400107 | Ophthalmic Image ROI Measurements | Ophthalmic Image ROI Measurements |
| 400110 | Repositioned ROI or grid | Measurements from ROI or grid repositioned by operator |
| 400200 | Mean Deviation | Weighted average deviation from the age corrected normal field, as decibel. |
| 400201 | Pattern Standard Deviation | Weighted square root of loss variance, as decibel. |
| 400202 | False positive percent | Estimated percentage of all patient responses that occurred at a time when no visual stimulus was present (false positive responses), as percent.<br><br>Note: Commonly used when performing Swedish Interactive Threshold Algorithm (SITA) based measurements. |
| 400203 | False negative percent | Estimated percentage of all stimuli that were not seen by the patient but were previously seen at a lower luminance earlier in the visual field test (false negative responses), as percent.<br><br>Note: Commonly used when performing Swedish Interactive Threshold Algorithm (SITA) based measurements. |
| 400204 | Fixation losses ratio | The ratio between the number of times a patient loses visual fixation while maintaining a visual gaze on a single location and the number of trials presented. Conveyed as a text string in the form of fixation loss responses over number of trials such as "3/15". |

| Code Value | Code Meaning | Definition |
|---|---|---|
| 400205 | False positive ratio | The ratio between the number of times patient responses that occurred at a time when no visual stimulus was present (false positive responses) and the number of trials presented. Conveyed as a text string in the form of false positive responses over the number of trials such as "3/7".<br><br>Note: Commonly used when NOT performing Swedish Interactive Threshold Algorithm (SITA) based measurements. |
| 400206 | False negative ratio | The ratio between the number of times stimuli that were not seen by the patient but were previously seen at a lower luminance earlier in the visual field test (false negative responses) and the number of trials presented. Conveyed as a text string in the form of false negative responses over the number of trials such as "3/7".<br><br>Note: Commonly used when NOT performing Swedish Interactive Threshold Algorithm (SITA) based measurements. |
| 400300 | Cup to disc area ratio | Ratio of the optic disc cup area to the disc area |
| 400301 | Cup to disc ratio vertical | Ratio of the vertical diameter of the physiological cup to that of the vertical diameter of the optic disc |
| 400302 | Cup to disc ratio horizontal | Ratio of the horizontal diameter of the physiological cup to that of the vertical diameter of the optic disc |
| 400303 | Optic disc rim area | Area of the "rim" portion of the optic disc, as $mm^2$ |
| 400304 | Optic disc cup area | Area of the "cup" portion of the optic disc, as $mm^2$ |
| 400305 | Optic disc area | Area of the optic disc, as $mm^2$ |
| 400400 | Retinal nerve fiber layer average thickness | Average measurement approximating the distance related to the structure between the internal limiting membrane (ILM) and the outer border of the retinal nerve fiber layer (RNFL) in all regions, as microns. |
| 400401 | Retinal nerve fiber layer inferior thickness | Average measurement approximating the distance related to the structure between the internal limiting membrane (ILM) and the outer border of the retinal nerve fiber layer (RNFL) in the inferior region, as microns. |
| 400402 | Retinal nerve fiber layer superior thickness | Average measurement approximating the distance related to the structure between the internal limiting membrane (ILM) and the outer border of the retinal nerve fiber layer (RNFL) in the superior region, as microns. |
| 400403 | Retinal nerve fiber layer temporal thickness | Average measurement approximating the distance related to the structure between the internal limiting membrane (ILM) and the outer border of the retinal nerve fiber layer (RNFL) in the temporal region, as microns. |
| 400404 | Retinal nerve fiber layer nasal thickness | Average measurement approximating the distance related to the structure between the internal limiting membrane (ILM) and the outer border of the retinal nerve fiber layer (RNFL) in the nasal region, as microns. |

| Code Value | Code Meaning | Definition |
|---|---|---|
| 400405 | Retinal nerve fiber layer symmetry | Percent symmetry of the retinal nerve fiber layer (RNFL) thickness between the two eyes, as percent. |
| 400500 | Average GCL-IPL thickness | Average thickness between ganglion cell layer (GCL) and inner plexiform layer (IPL), as microns. |
| 400501 | Average GCL-IPL thickness superior hemifield | Average thickness between ganglion cell layer (GCL) and inner plexiform layer (IPL) in the superior hemifield, as microns. |
| 400502 | Average GCL-IPL thickness inferior hemifield | Average thickness between ganglion cell layer (GCL) and inner plexiform layer (IPL) in the inferior hemifield, as microns. |
| 400503 | Average GCL-IPL thickness nasal hemifield | Average thickness between ganglion cell layer (GCL) and inner plexiform layer (IPL) in the nasal hemifield, as microns. |
| 400504 | Average GCL-IPL thickness temporal hemifield | Average thickness between ganglion cell layer (GCL) and inner plexiform layer (IPL) in the temporal hemifield, as microns. |
|  |  |  |
| 400600 | Central keratometry minimum  power | The lowest refractive power in the central zone, as diopters (for example central 3mm)<br>Note: This code is related to DICOM attribute Keratometric Power (0046,0076) within the attribute Flat Keratometric Axis Sequence (0046,0080). |
| 400601 | Central keratometry minimum radius of curvature | The longest radius of curvature of the two most extreme orthogonal keratometry measurements in the central zone, as mm(for example central 3mm)<br>Note: This code is related to DICOM attribute Radius of Curvature (0046,0075) within the attribute Flat Keratometric Axis Sequence (0046,0080). |
| 400602 | Central keratometry minimum power axis | The meridian of the lowest power radius of the two most extreme orthogonal keratometry measurements in the central zone, as degrees (for example central 3mm)<br>Note: This code is related to DICOM attribute Keratometric Axis (0046,0077) within the attribute Flat Keratometric Axis Sequence (0046,0080). |
| 400603 | Central keratometry maximum power | The highest refractive power in the central zone, as diopters (for example central 3mm)<br>Note: This code is related to DICOM attribute Keratometric Power (0046,0076) within the attribute Steep Keratometric Axis Sequence (0046,0074). |
| 400604 | Central keratometry maximum radius of curvature | The shortest radius of curvature of the two most extreme orthogonal keratometry measurements in the central zone, as mm (for example central 3mm)<br>Note: This code is related to DICOM attribute Radius of Curvature (0046,0075) within the attribute Steep Keratometric Axis Sequence (0046,0074). |

**Commented [HS2]:** Bring in necessary attributes

| Code Value | Code Meaning | Definition |
|---|---|---|
| 400605 | Central keratometry maximum power axis | The meridian of the highest power radius of the two most extreme orthogonal keratometry measurements in the central zone, as degrees (for example central 3mm)<br><br>Note: This code is related to DICOM attribute Keratometric Axis (0046,0077) within the attribute Steep Keratometric Axis Sequence (0046,0074). |
| 400606 | Minimum corneal thickness | The thickness of the cornea at that location representing the minimum measurable thickness, as microns |
| 400700 | Endothelial cell density | The density of endothelial cells present on the innermost surface of the cornea as cells/mm2 |