

**ZEISS CIRRUS OCT**

Glaucoma essentials

[zeiss.com/cirrus](http://zeiss.com/cirrus)



Seeing beyond

# Elevating your glaucoma practice with ZEISS CIRRUS OCT

CIRRUS® OCT from ZEISS is part of your comprehensive glaucoma work-up designed to allow you to confidently assess, monitor, and manage glaucoma with clarity and precision. This guide highlights the essential CIRRUS tools that support efficient workflows and meaningful clinical insights.

With a single CIRRUS session, clinicians can capture a complete picture of the eye—from the posterior pole and anterior chamber to perfused retinal and choroidal vasculature with OCT angiography. The ZEISS CIRRUS OCT stands apart with:

- A full suite of analyses across the RNFL, ONH, and macular ganglion cell complex, including vascular information
- Advanced anterior chamber imaging and measurement tools, from corneal epithelium thickness mapping to deep-chamber visualization

While CIRRUS supports multiple models and generations, the CIRRUS 6000 introduces additional advantages for glaucoma specialists with its dual reference databases (RDB1 and RDB2).

For continuity of progression analysis, CIRRUS 6000 maintains RDB1—and elevates performance with the enhanced RDB2.

Purpose-built to leverage advanced imaging, RDB2 offers a richer, more representative foundation for glaucoma assessment:

- A more diverse, older dataset with 72% of subjects over age 50
- 870 subjects, more than triple that of previous database
- Three different disk sizes for more personalized assessment reducing misrepresentations



Note: This guide is intended to help provide basic information, it is not intended to replace your User Manual.

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# Glaucoma Management Scan Options

## ZEISS CIRRUS OCT

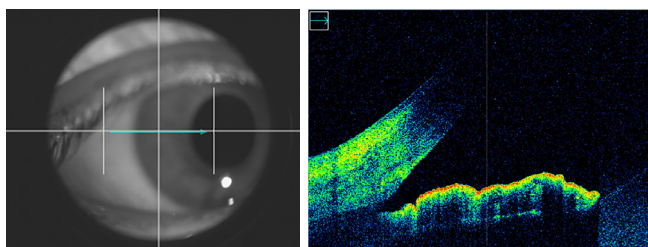
ZEISS CIRRUS OCT provides a comprehensive set of scan protocols for posterior pole and anterior segment for glaucoma management. With OCT angiography, clinicians can visualize perfused retinal, optic nerve and choroidal vasculature, adding another dimension to glaucoma evaluation.

### Posterior pole

CIRRUS cube scans include three anatomical sites: parapapillary RNFL, ONH, and macular ganglion cell complex. These scans are acquired sequentially during a single protocol and provide complementary information for evaluating glaucomatous structure and change over time.

To visualize, document, and analyze glaucomatous changes in the retina, clinicians can select from two cube scan types:

- Macular Cube (512 × 128)
- Optic Disc Cube (200 × 200)



HD Angle scans: Iris and iridocorneal angle B-scan

### Anterior segment

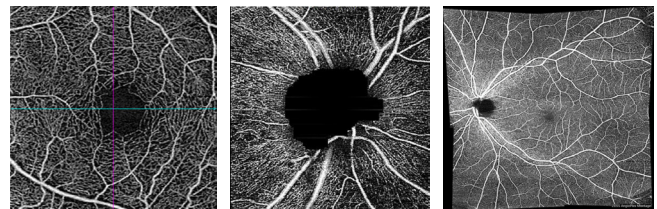
OCT imaging provides rapid, noninvasive, high-resolution axial visualization of the anterior chamber and iridocorneal angle—ideal for detecting, documenting, and monitoring narrow or suspicious angles.

To access the full range of anterior segment imaging capabilities and analyses, simply activate the CIRRUS Anterior Segment license and attach the appropriate external lens.

Available lenses include:

- **Anterior Chamber Lens** – for anterior chamber and wide angle-to-angle scans
- **Cornea Lens** – for HD cornea and pachymetry imaging

*Note: Anterior chamber features are licensed separately and may not be available in all markets. For information on feature availability, contact your local ZEISS representative.*



AngioPlex

AngioPlex ONH

AngioPlex Montage

### OCT Angiography

With AngioPlex® OCT Angiography from ZEISS, CIRRUS delivers high-quality, motion-corrected visualization of the retinal and choroidal vasculature—empowering clinicians to assess perfusion and vascular structure with remarkable clarity.

For screening and routine evaluations, CIRRUS offers flexible scan options tailored to your workflow:

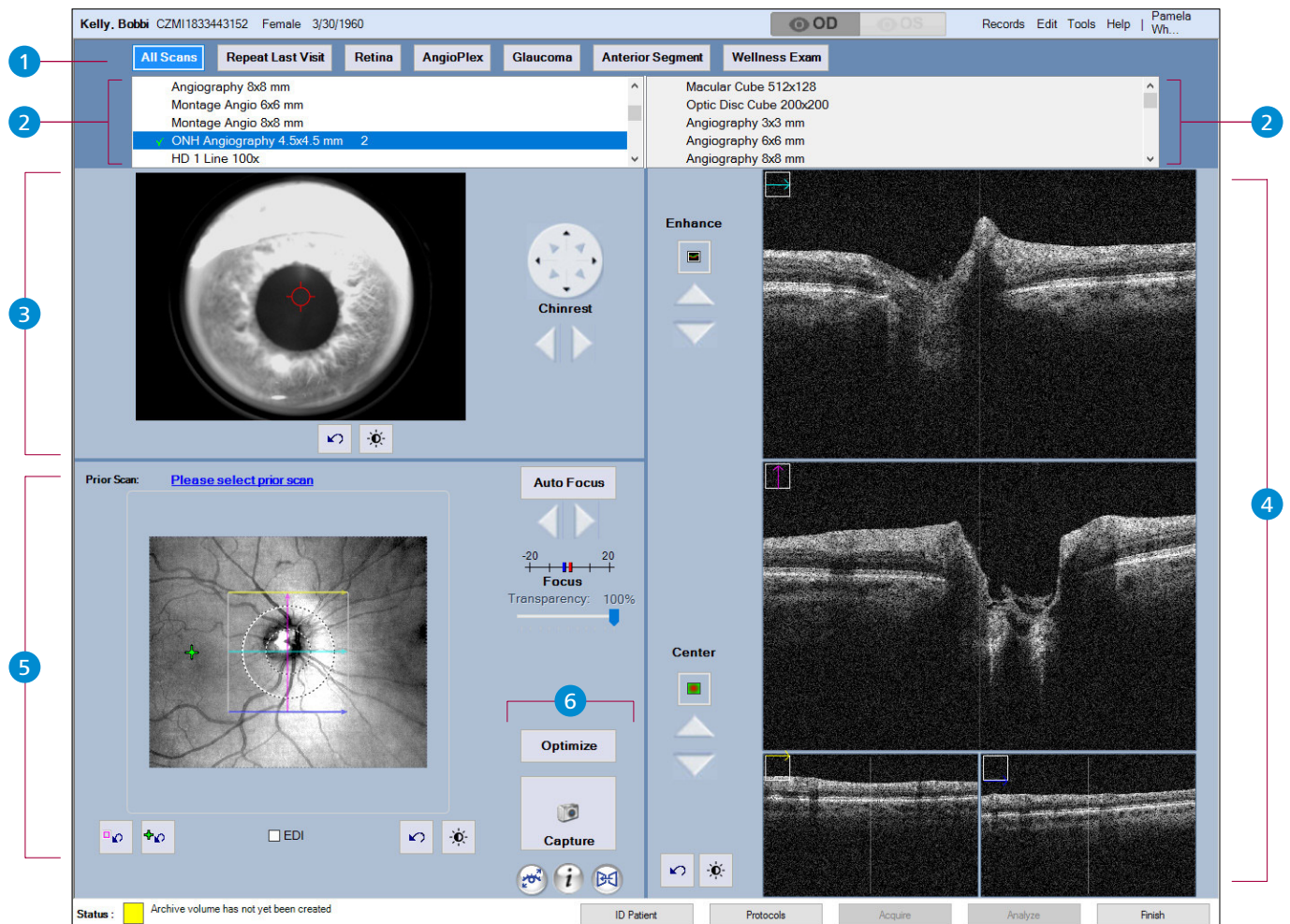
- CIRRUS 5000: Angio 8×8 single scan and Montage 8×8 for wider coverage
- CIRRUS 6000: High-speed 12×12 scan for expansive views and enhanced detail in a single acquisition

To support glaucoma evaluation around the optic nerve head, AngioPlex ONH scans capture a 4.5 × 4.5 mm cube of perfusion data precisely centered on the ONH—providing another valuable dimension to structural assessments.

*Note: OCT Angiography and AngioPlex ONH features described in this section are licensed separately and may not be available in all markets. Contact your local ZEISS representative for details and availability.*

# Posterior Segment Scans: Acquire Screen Overview

ZEISS CIRRUS OCT



## 1. Protocols

Selects a protocol

## 2. Scan selector

Selects scan type for OD and OS

## 3. Iris viewport

Displays the live image of the iris



## Pupil target

Indicates the pupil center alignment



## Brightness and contrast

Opens brightness and contrast adjustment controls



## Reset

Resets your adjustments of the iris image



## Chinrest controls

Circular controls adjust the patient chinrest up, down, right or left

Left arrow moves chinrest toward patient

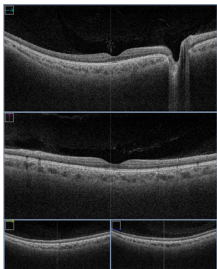
Right arrow moves chinrest toward device



## Posterior Segment Scans: Acquire Screen Overview (continued)

### 4. B-scans Viewport

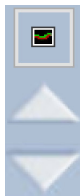
Displays the live B-scan images



### Enhance

Button automatically adjusts polarization of the live B-scan images

Arrows adjust polarization manually



### Center

Button automatically centers the live B-scan images

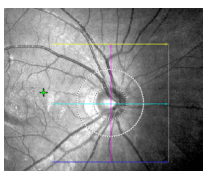
Arrows adjust centering manually



### 5. Scan presets

#### Fundus Viewport

Displays the live image and scan pattern



#### Fixation target

Displays the location of the fixation target



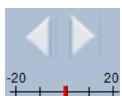
#### Auto Focus

Automatically focuses the live scan



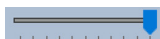
#### Manual focus

Focus slider or arrows adjust focus manually



#### Transparency

Controls the opacity of the overlay



#### Reset scan pattern

Returns the scan pattern to its default position



#### Reset fixation target

Returns the fixation target to the center



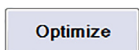
#### EDI

Inverts the OCT signal profile so the strong part of the signal is at the bottom of the B-scan



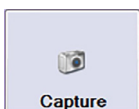
### 6. Optimize

Automatically centers and enhances the B-scan



#### Capture

Captures the scan



#### FastTrac

Indicates whether FastTrac® is on or off



#### Help

Displays tips for acquiring the best scan



#### Track to prior

Sets tracking to align and track the scan at the same location on the retina as the selected prior scan



*NOTE: Tracking to prior automatically enables FastTrac.*

# Posterior Segment Scans: Acquisition Workflow

## ZEISS CIRRUS OCT

The following posterior segment workflow guidelines apply to the acquisition of CIRRUS OCT posterior segment scans and angiography scans.

### 1. Select the patient

To begin, you must choose the appropriate patient record before acquiring or analyzing scans. Add a new patient or select an existing one as needed.

### 2. Enter Acquire mode

Select **Acquire** at the bottom of the screen to access scanning controls and image capture functions.

### 3. Select the scan

Choose a scan from **All Scans** or from a scan **Protocol**. For the anterior segment protocol, available scans depend on the external lens used. Relevant protocols for glaucoma diagnosis and management include glaucoma, anterior segment, and wellness.

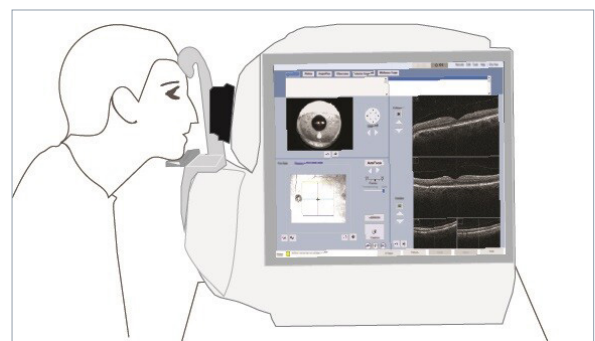
#### Scan options by protocol

Glaucoma	Anterior Segment	Wellness
Optic Disc Cube 200 × 200	HD Angle <sup>1</sup>	Macular Cube 512 × 128
ONH Angiography 4.5 × 4.5 mm	5-Line Raster <sup>1</sup>	Optic Disc Cube 200 × 200
Macular Cube 512 × 128	Anterior Segment Cube 512 × 128 <sup>1</sup>	
Macular Cube 200 × 200	HD Cornea <sup>2</sup>	
	Pachymetry <sup>2</sup>	
	Anterior Chamber <sup>3</sup>	
	Wide Angle-to-Angle <sup>3</sup>	

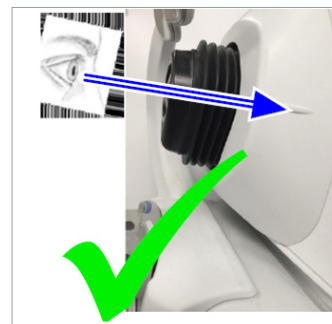
1. No external lens
2. Corneal lens
3. Anterior Chamber lens

### 4. Position the patient

- Explain the importance of steady fixation on the green target light inside the lens.
- Place the patient's chin appropriate cup: **left cup = right eye, right cup = left eye.**
- Ensure forehead contact with the headrest.

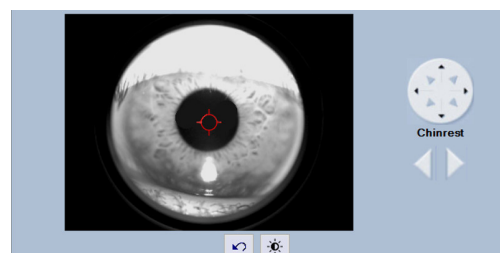


- Adjust the chinrest height to align the canthus marker with the patient's eye.



### 5. Center and focus the pupil in the Iris Viewport

- Adjust the patient's position to find the iris and pupil.
- Use the chinrest controls or click on the pupil in the Iris Viewport to sharpen and center the iris.
- Ensure the patient moves with the chinrest.

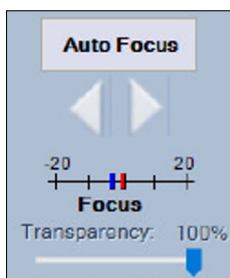


## Posterior Segment Scans: Acquisition Workflow (continued)

### 6. Confirm fundus image focus

Good fundus focus improves signal strength and enhances B-scan image quality and colors.

- **CIRRUS 5000 and CIRRUS 6000:** Manually sharpen focus of the fundus with the left/right **Focus arrows**, using the retina vessels for reference.
- **CIRRUS 500:** Select **Auto Focus**. Remind the patient to move with the chinrest, fixate on the target, and avoid blinking during the auto focus process.



### 7. Optimize the OCT scans

Click on the **Optimize** button to center and enhance the B-scan images.

- Use the lower two B-scans as guides for optimal scan positioning.
- Ensure B-scans are centered, not cut off, not too high or low, and not inverted.
- Repeat **Optimize** if needed for further improvement.

### 8. Capture the scan

**FastTrac** – Utilizes anatomical landmarks to ensure precise scan alignment and repeatability.

**FastTrac ON**



**FastTrac OFF**



**Track to Prior** – Select **ON** to enable consistent follow-up imaging using previous scan positioning. Select **OFF** if you want to move the scan to a different location.

**Track to prior ON**

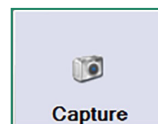


**Track to prior OFF**



**Before capturing:**

- Have the patient blink once or twice, then open eyes wide to minimize eyelash interference.
- Capture the scan when the border around the **Capture** button is green.



**If the border is red:**

- Recenter the B-scan using Center controls or Shift + mouse wheel.
- Adjust focus or run Auto Focus.
- Change prior scan or disable Track to Prior.
- Turn FastTrac off if needed.

### 9. Review before saving

On the Review screen:

- Confirm **Signal Strength  $\geq 6$**  ( $\geq 8$  is ideal).
- Ensure B-scans are centered with no missing data and image quality is good.
- If quality or position are poor, select **Try Again**.
- If quality and position are good, click **Save**.

The patient may remain positioned for additional scans of the same eye.

# Anterior Segment HD Scans: Acquisition Workflow

## ZEISS CIRRUS OCT





Anterior segment HD scan guidelines apply to Anterior Chamber, Wide Angle-to-Angle, HD Angle, HD Cornea, and Pachymetry.

### Key differences from posterior segment workflow

- No fundus image
- No FastTrac or Track to Prior
- No Optimize Button

### Anterior segment workflow

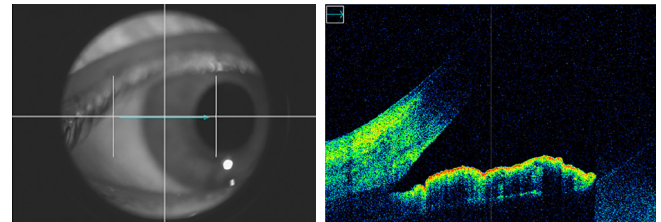
1. Attach the required external lens (if applicable). Scan types requiring lenses appear only once the correct lens is mounted.
2. Have the patient fixate on the center target (will be blurry with external lenses).
3. Align the scan according to the scan-specific guidelines using the directional chinrest arrows on the screen, keyboard arrows, or mouse wheel.
4. Have the patient open eyes wide just before capture to minimize eyelash interference.
5. **Capture**, review and **Save** if scan quality is acceptable.

Scans	Lens	Symbol	Label
Anterior Chamber Wide Angle-to-Angle			<b>ANTERIOR CHAMBER</b>
HD Cornea Pachymetry			<b>CORNEA</b>

### Scan-specific guidelines

#### HD Angle (no external lens)

- Center on the limbus to scan the angle.
- Adjust as needed to bring the angle into view.
- Angle should be centered in the lower quadrant of the B-scan.
- The fixation target disappears when correctly aligned; use external fixation if needed.

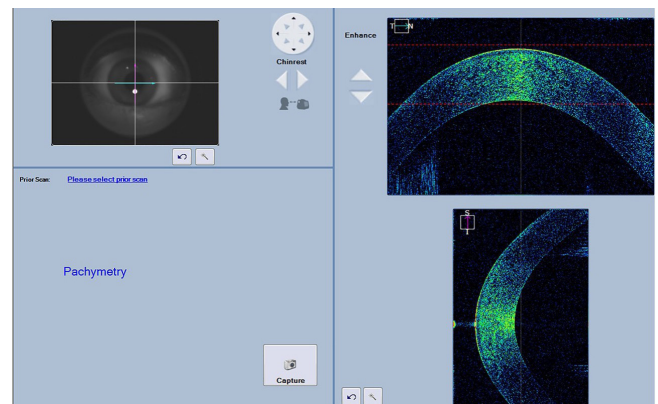


*Note: If the angle recess in the B-scan appears shadowed by the sclera, shift the scan slightly along the limbus or adjust the patient's fixation farther away from center.*

### Pachymetry and HD Cornea (corneal lens required)

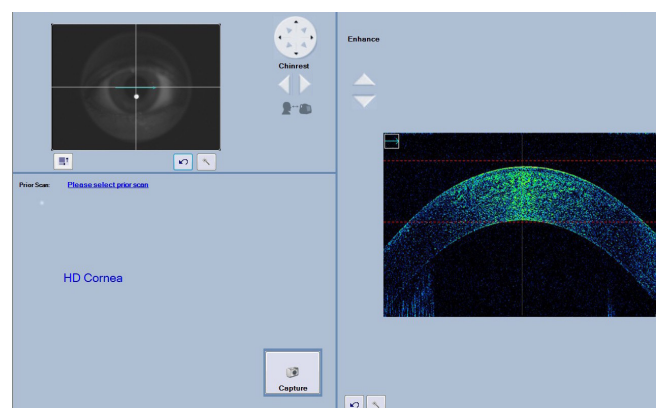
#### Pachymetry

- Center the iris in the iris viewport.
- The upper scan must fit between the red lines with a strong vertical reflection; adjust as needed.

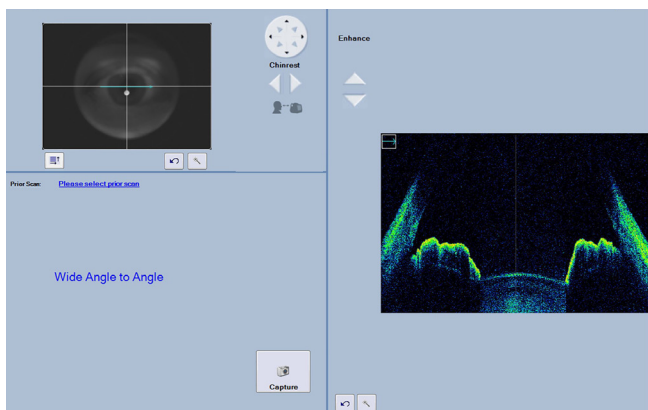


#### HD Cornea

- Center using the upper iris and B-scan viewports.



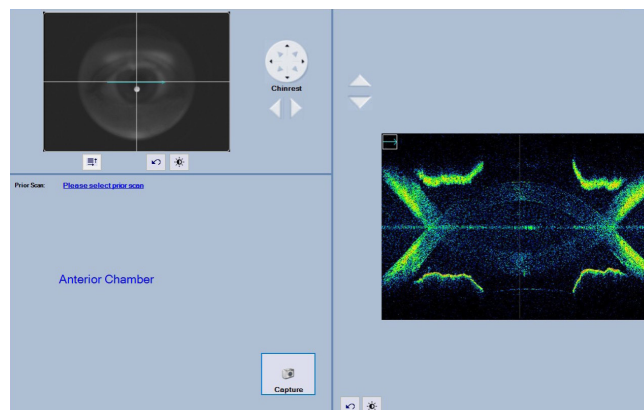
## Anterior Segment HD Scans: Acquisition Workflow (continued)



### Wide Angle-to-Angle (anterior chamber lens)

- Center the pupil in iris viewport.
- Adjust the B-scan using the chin rest arrows until both angles are in view. Keep angles near bottom of B scan viewport.
- When optimally placed, the scan line should pass through the pupil center in the iris viewport.

*Note: With wide angle to wide angle scans, the iris viewport image will be slightly out of focus even when correctly aligned.*



### Anterior Chamber (anterior chamber lens)

- Center the pupil in the iris viewport.
- Adjust the B-scan until the cornea and anterior chamber angles are aligned as in the image above. Note: strong vertical reflection will be visible when centered on corneal vertex.
- If the anterior chamber is significantly tilted, adjust the patient's fixation point laterally, left for the right eye, right for the left eye (i.e., opposite direction of tilt), until the scan is horizontal.

*Tip: Corneal images should not touch the iris/lens when properly aligned*

## Improving Signal on CIRRUS OCT

Measuring the amount of light passing through the iris to the retina is essential to capturing a good quality image. While signal strength greater than or equal to six is acceptable, greater than or equal to eight is ideal.

### To improve the signal:

- Ensure uniform fundus illumination and focus; avoid dark corners.
- Verify B-scans are not positioned too low.
- Prepare the patient thoroughly.
- Optimize alignment.
- Adjust for eye-specific challenges.\*

\*See, **Scanning Complex Eye Conditions** (p. 11)



# Scanning Complex Eye Conditions & Scan Troubleshooting

## ZEISS CIRRUS OCT

### Eye conditions and solution

Condition	Solutions
Small pupils	<ul style="list-style-type: none"> <li>▪ Dilate</li> <li>▪ Dim room lights</li> <li>▪ Reduce external illumination</li> <li>▪ Ask patient to wiggle toes/fingers during scan</li> </ul>
Cataract (or other opacities)	<ul style="list-style-type: none"> <li>▪ Dilate</li> <li>▪ Scan around edges of opacity</li> <li>▪ Find a region with improved red/orange signal</li> </ul>
High myopia (>8 D)	<ul style="list-style-type: none"> <li>▪ Use Manual Focus when using a CIRRUS 5000/6000</li> <li>▪ Enter spherical equivalent for pre-focus</li> <li>▪ Run Auto Focus when using a CIRRUS 500</li> </ul>
Poor fixation or central vision loss	<ul style="list-style-type: none"> <li>▪ Verbally guide fixation</li> <li>▪ Disable FastTrac if necessary to allow capturing*</li> </ul>
Tilted retina	<p>Seen more often with the Optic Disc Cube on myopic patients</p> <ul style="list-style-type: none"> <li>▪ Place scan target inside the pupil at the 3 o'clock or 9 o'clock position to flatten the B-scan</li> </ul>
Dry eyes	<ul style="list-style-type: none"> <li>▪ Encourage blinking before scanning</li> <li>▪ Use artificial tears if needed</li> </ul>
Deep optic nerve cup	<ul style="list-style-type: none"> <li>▪ There is no need to capture the bottom of the cup</li> <li>▪ Prioritize RNFL and cup-to-disc data</li> </ul>

*\*While disabling FastTrac may affect scan quality, it might be the most effective option for acquiring data for a challenging condition.*

### Troubleshooting

Issue	Solution
Fundus image not sharp	<ul style="list-style-type: none"> <li>▪ When using a CIRRUS 5000/6000, use the manual focus arrows</li> <li>▪ When using a CIRRUS 500, use auto-focus</li> </ul>
Red border prior to capture	<ul style="list-style-type: none"> <li>▪ Recenter using <b>Optimize</b> or the <b>Center</b> controls, or hold the Shift key and roll mouse wheel</li> <li>▪ Adjust focus manually or with <b>Auto Focus</b></li> <li>▪ Change/disable Track to Prior</li> <li>▪ Disable FastTrac</li> </ul>
Inverted OCT image	<ul style="list-style-type: none"> <li>▪ Use <b>Center Up/Down</b> controls until image flips and is centered</li> </ul>
Tilted B-scans	<ul style="list-style-type: none"> <li>▪ Reposition scan within pupil in iris viewport to the 3 o'clock or 9 o'clock position</li> </ul>
Signal degradation	<ul style="list-style-type: none"> <li>▪ Clean objective lens</li> </ul>
Tracking follow-up mismatch	<ul style="list-style-type: none"> <li>▪ Turn off Track to Prior and manually move the scan to the area of interest</li> </ul>

# RNFL and ONH Analysis

## ZEISS CIRRUS OCT

Based on the 6 x 6 mm data cube captured by the Optic Disc Cube 200 x 200 scan, this report\* shows assessment of RNFL and ONH for both eyes.

### 1. Nerve Fiber Layer (RNFL) thickness map

is a topographical display of RNFL. An hourglass shape of yellow and red colors is typical of normal eyes.

2. Key parameters, compared to reference data, are displayed in table format.

3. RNFL Deviation Map shows deviation from reference. OCT *En face* fundus image shows boundaries of the cup and disc and the RNFL calculation circle.

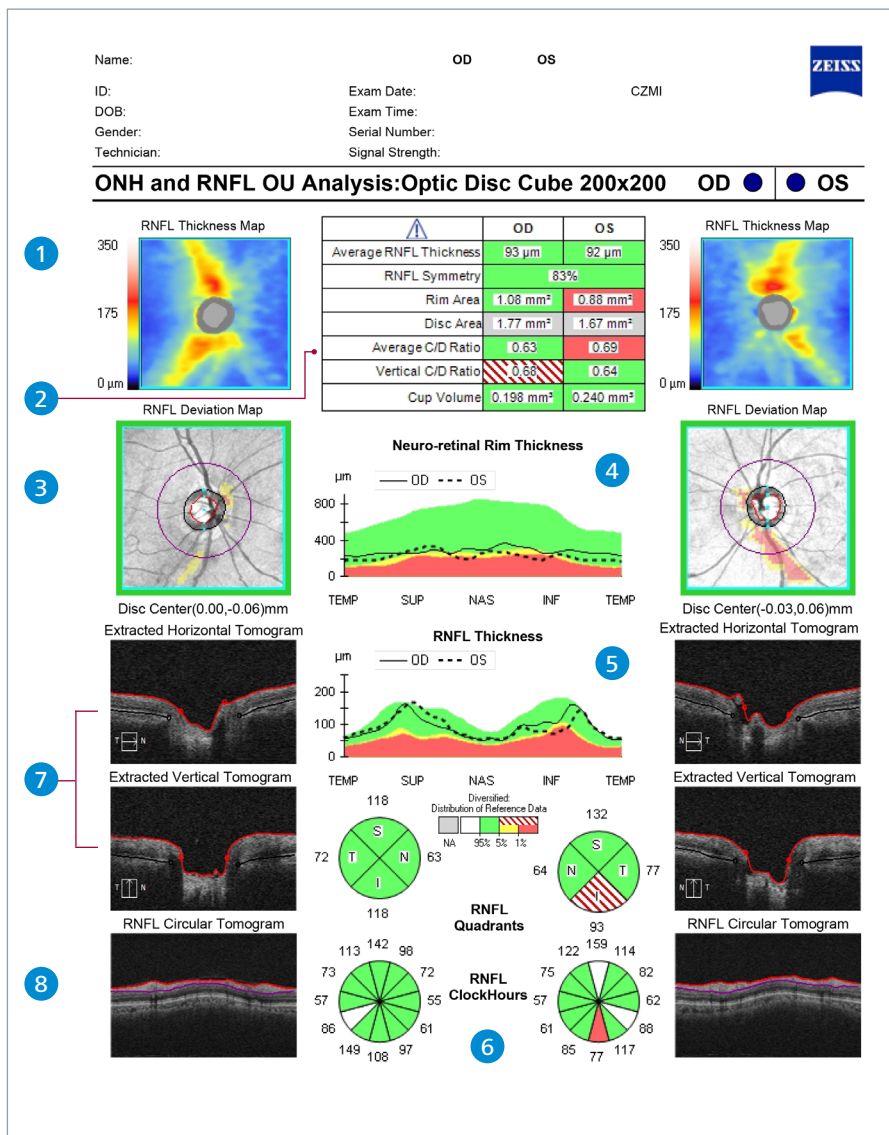
4. Neuro-retinal Rim Thickness profile is matched to reference data.

5. RNFL TSNIT graph displays patient's RNFL measurement along the calculation circle, compared to reference data.

6. RNFL Quadrant and Clock Hour average thickness is matched to reference data.

7. Horizontal and vertical B-scans are extracted from the data cube through the center of the disc. RPE layer and disc boundaries are shown in black. ILM and cup boundaries are shown in red.

8. RNFL calculation circle is automatically centered on the optic disc and extracted from the data cube. Boundaries of the RNFL layer segmentation is illustrated.



\*The report shown is from a CIRRUS 6000.

## RNFL and ONH Analysis (continued)

Key parameters, compared to reference data, are displayed in table and chart formats.

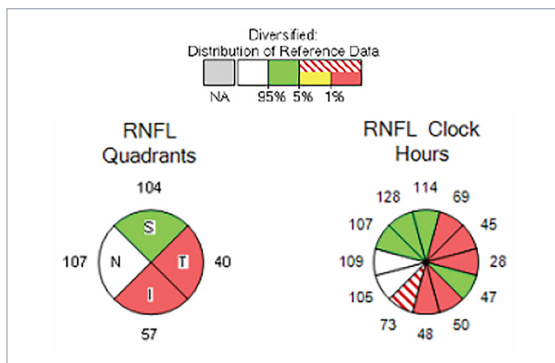
For CIRRUS 5000 data reference comparison for ONH parameters is based on patient’s age and disc size and for RNFL is based on patient’s age. CIRRUS 6000 ONH and RNFL are based on patient’s age and disc size. For a particular age and disc size, the patient is expected to have rim volume, C/D ratio, etc. within certain ranges. Those parameters will be shaded red, yellow, green and white based on how they compare to normal ranges. Consequently, disc area values are not compared to normative data, and therefore shaded gray on the summary table. When the disc area is outside normal limits, normative data comparison is not applied. When there is no normative data available for comparison, the parameters are shaded gray instead of the green yellow, red shown in this example. The reference database is not available for patients under 18 years of age.

The Disc Area values of patients in the CIRRUS ethnically diverse reference database 1 (see User Manual for details on the study) fell within these ranges: one third of patients had Disc Area values less than 1.58 mm<sup>2</sup>, one third of patients had Disc Area values between 1.58 and 1.88 mm<sup>2</sup>, and one third of patients had Disc Area values larger than 1.88 mm<sup>2</sup>.

### Key parameters compared to reference data

⚠	OD	OS
Average RNFL Thickness	82 μm	77 μm
RNFL Symmetry	39%	
Rim Area	0.71 mm <sup>2</sup>	1.95 mm <sup>2</sup>
Disc Area	1.52 mm <sup>2</sup>	2.21 mm <sup>2</sup>
Average C/D Ratio	0.74	0.35
Vertical C/D Ratio	0.73	0.47
Cup Volume	0.391 mm <sup>3</sup>	0.027 mm <sup>3</sup>

### RNFL Quadrant and Clock Hours matched to reference data



The Disc Area values of patients in the CIRRUS ethnically diverse reference database 2 (see User Manual for details on the study – CIRRUS 6000 data only) fell within these ranges: one third of patients had Disc Area values less than 1.57 mm<sup>2</sup>, one third of patients had Disc Area values between 1.57 and 1.88 mm<sup>2</sup>, and one third of patients had Disc Area values larger than 1.88 mm<sup>2</sup>.

In the table of values, Rim Area, Average C/D Ratio, Vertical C/D Ratio and Cup Volume for RDB 1 have a gray background color when the Disc Area is less than 1.3 mm<sup>2</sup> or greater than 2.5 mm<sup>2</sup>. For RDB 2 the average C/D Ratio will have a gray background when the ratio is below 0.25. The Vertical C/D Ratio will also have a gray background when it is less than 0.25. For CIRRUS 6000, the model used to fit the reference data is not applicable for small cup to disc ratios.

*Note: Gray indicates the database has an insufficient number of subjects with the disc areas of these particular sizes to reference.*

### The values below are based on a 69 year old patient (RDB 1).

Parameter	Normal Range*
Average RNFL Thickness	75.0 - 107.2
RNFL Symmetry	76% - 95%
Rim Area	1.03 - 1.69
Average C/D Ratio	0.64 - 0.21
Vertical C/D Ratio	0.62 - 0.21
Cup Volume	0.01 - 0.035

Parameter	Normal Range*
Temporal Quadrant	45.1 - 82.2
Superior Quadrant	88.9 - 136.7
Nasal Quadrant	50.0 - 86.2
Inferior Quadrant	89.4 - 138.3


Clock Hour	Normal Range*
9	36.4 - 67.4
10	52.7 - 100.5
11	87.2 - 154.6
12	70.7 - 155.7
1	72.6 - 133.9
2	52.4 - 109.7
3	41.7 - 70.4
4	44.8 - 89.0
5	61.9 - 125
6	85.7 - 163.2
7	84.8 - 159.4
8	42.2 - 90.2

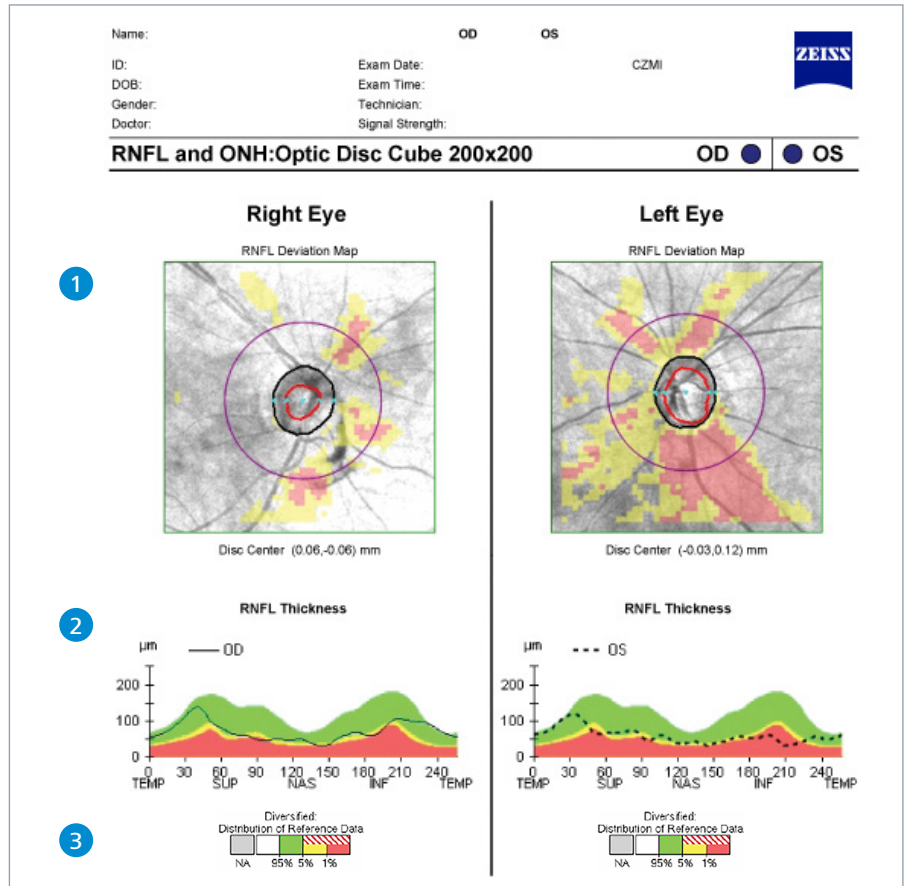
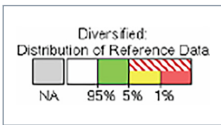
\* Normal range is in micrometers. See User Manual for more information on reference data.

# RNFL and ONH Analysis (continued)

1. RNFL Deviation Map facilitates discussion with patient.
2. RNFL peripapillary thickness profile is shown for each eye.

**Distribution of Normals:** The gray color shown in the legend represents "Not applicable." Values will be shown in gray when reference data is not applicable because the database has insufficient data to match with the disc area.

3.  RDB 2 introduces confidence interval overlapping shading, where this color coding indicates, "The thinnest 5% of measurements fall within overlapping 95% Confidence Intervals of the 1% and 5% reference limits or below."



The Distribution of Normals color scheme is used for both the RNFL and the Optic Nerve Head analysis parameters. The table clarifies how the color scheme is used for each of the parameters referencing RDB 1 for example.

### RDB 1

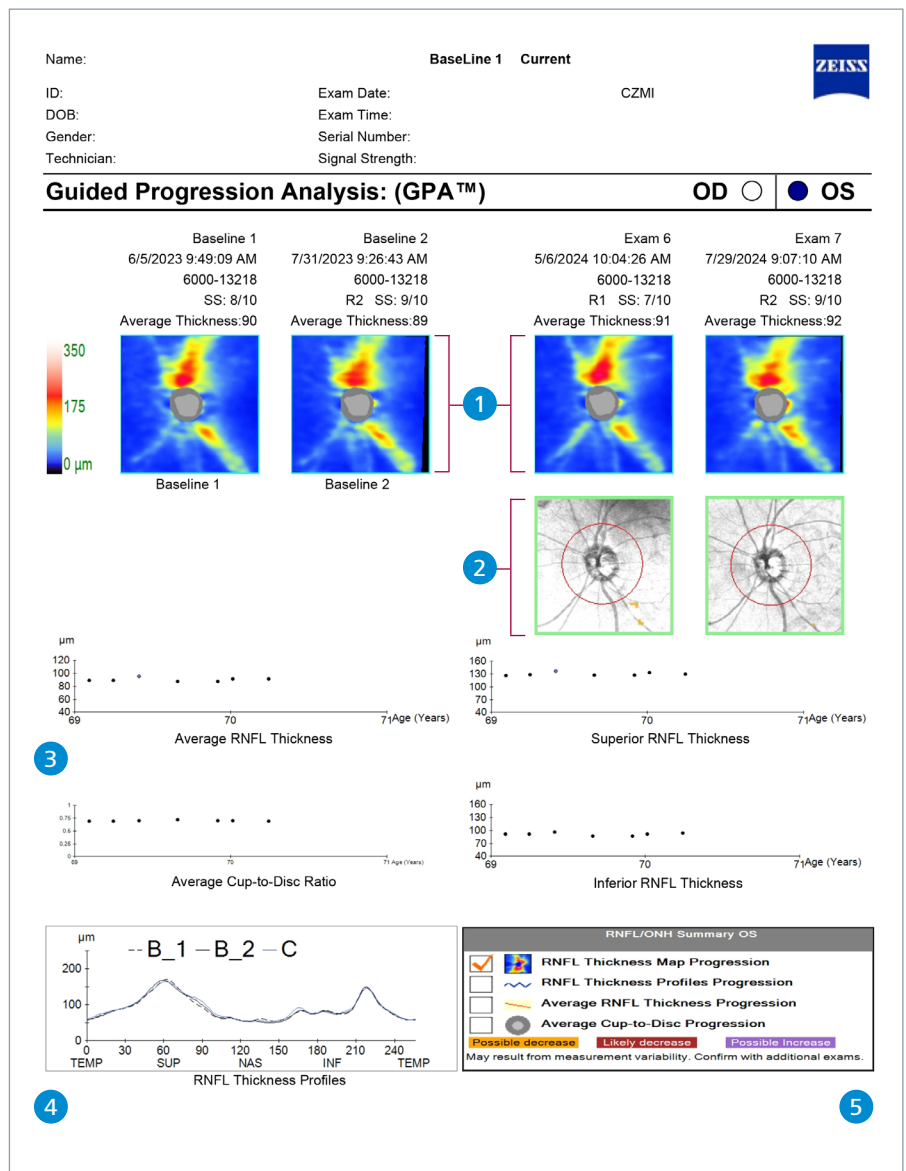
Measurement	Matched to Normal Based On	Gray	White	Green	Yellow	Red
<b>RNFL</b>						
Average RNFL Thickness, RNFL Symmetry, RNFL Clock Hours, RNFL Quadrants, RNFL Thickness (graph)	Age	Gray shading does not apply to RNFL measurements	The thickest 5% of measurements fall in the white area (white > 95%).	90% of measurements fall in the green area (5% < green < 95%).	The thinnest 5% of measurements fall in the yellow area or below (1% < yellow < 5%, suspect).	The thinnest 1% of measurements in red are considered outside normal limits (red < 1%, outside normal limits).
<b>Optic Nerve Head</b>						
Rim Area and Neuroretinal Rim Thickness (graph)	Disc Area and Age	ONH Normative Database is not applicable if: 1) The disc area is larger than 2.5 mm <sup>2</sup> or smaller than 1.33 mm <sup>2</sup> , or 2) The Average or Vertical C/D Ratio is below 0.25, or 3) The ONH Normative Database license has not been activated.	The largest 5% of measurements fall in the white area (white > 95%).	90% of measurements fall in the green area (5% < green < 95%).	The smallest 5% of measurements fall in the yellow area or below (1% < yellow < 5%, suspect).	The smallest 1% of measurements in red are considered outside normal limits (red < 1%, outside normal limits).
Average C/D Ratio, Vertical C/D Ratio, Cup Volume		The smallest 5% of measurements fall in the white area (white > 95%).	90% of measurements fall in the green area (5% < green < 95%).	The largest 5% of measurements fall in the yellow area or below (1% < yellow < 5%, suspect).	The largest 1% of measurements in red are considered outside normal limits (red < 1%, outside normal limits).	

# ONH/RNFL Guided Progression Analysis (GPA)

## ZEISS CIRRUS OCT

With **Guided Progression Analysis™ (GPA™)**, CIRRUS can perform event analysis and trend analysis of RNFL thickness and ONH parameters (e.g., Average Cup-to-Disc ratio). Event analysis assesses change from baseline compared to expected variability. If change is outside the range of expected variability, it is identified as progression. Trend analysis looks at the rate of change over time, using linear regression to determine rate of change.

- 1. RNFL Thickness Maps** provide a color-coded display of RNFL for two baseline exams and two most recent exams.
- 2. RNFL Thickness Change Maps** demonstrate change in RNFL thickness. Up to 8 exams are automatically registered to baseline for precise point-to-point comparison. Areas of possible decrease are color coded yellow when first noted, then red when the change is sustained over consecutive visits.
- 3. RNFL Thickness (Average, Superior, and Inferior) and Average Cup-to-Disc Ratio** values are plotted for each exam. In this example, the graph series would indicate yellow for possible decrease starting with the 4<sup>th</sup> point (progressing to red if a likely decrease) if more than four visits are available or the two visits displayed are 2 years apart. Rate of change is shown in text.
- 4. RNFL Thickness Profiles:** TSNIT values from exams are plotted. Areas of statistically significant change are color-coded orange when first noted and maroon when the change is sustained over consecutive visits.
- 5. RNFL/ONH Summary** summarizes GPA analyses and indicates with a check mark if there is possible or likely loss of RNFL:
  - RNFL Thickness Map Progression (best for focal change)
  - RNFL Thickness Profiles Progression (best for broader focal change)
  - Average RNFL Thickness Progression
  - Average Cup-to-Disc Progression



# ONH/RNFL Guided Progression Analysis (continued)

Printout includes an optional second page with RNFL and ONH Summary Parameters, including Rim Area, Disc Area, Average and Vertical Cup-to-Disc Ratio and Cup Volume. Each cell of the table can be color coded if change is detected.

1. **RNFL Thickness Maps** provide a color-coded display of RNFL for each exam, up to 8 including baseline.
2. **RNFL Thickness Change Maps** demonstrate change in RNFL thickness for up to 8 exams including baseline.
3. **Table of values** for each exam, up to 8 including baseline. For each exam there is information on exam date/time, registration method and signal strength. Values shown for RNFL thickness, Rim Area, Disc Area, Average and Vertical Cup-to-Disc Ratio and Cup Volume. Each cell of the table is color-coded if change is detected.
4. **Information** on abbreviations for registration methods and color coding.

Name: **BaseLine 1** **Current**

ID:
Exam Date: CZMI

DOB:
Exam Time:

Gender:
Serial Number:

Technician:
Signal Strength:

---

**Guided Progression Analysis: (GPA™)**
OD 
OS

Baseline1
Baseline2
Exam 3
Exam 4
Exam 5
Exam 6
Exam 7
Exam 8

1

2

**RNFL and ONH Summary Parameters**

3

	Exam Date/Time	Serial Number	Registration Method	SS	Avg RNFL Thickness (µm)	Inf Quadrant RNFL (µm)	Sup Quadrant RNFL (µm)	Rim Area (mm²)	Average Cup-to-Disc Ratio	Vertical Cup-to-Disc Ratio	Cup Volume (mm³)	
Baseline 1:	1	6/5/2023 9:49:09 AM	6000-13218		8/10	90	92	127	0.88	0.70	0.64	0.241
Baseline 2:	2	7/31/2023 9:26:43 AM	6000-13218	R2	9/10	89	92	130	0.90	0.70	0.63	0.250
	3	9/29/2023 9:15:17 AM	6000-13218	R1	8/10	96	97	137	0.91	0.71	0.62	0.251
	4	12/29/2023 9:05:55 AM	6000-13218	R2	8/10	88	87	128	0.85	0.73	0.66	0.272
	5	4/1/2024 9:12:12 AM	6000-13218	R1	7/10	88	87	128	0.90	0.71	0.64	0.257
	6	5/6/2024 10:04:26 AM	6000-13218	R1	7/10	91	92	134	0.88	0.71	0.65	0.254
Current:	7	7/29/2024 9:07:10 AM	6000-13218	R2	9/10	92	94	131	0.88	0.69	0.64	0.240

4

**Registration Methods**  
 R2 - Registration based on translation and rotation of OCT fundus  
 R1 - Registration based only on translation of disc center

Likely Decrease

Possible Decrease

Possible Increase

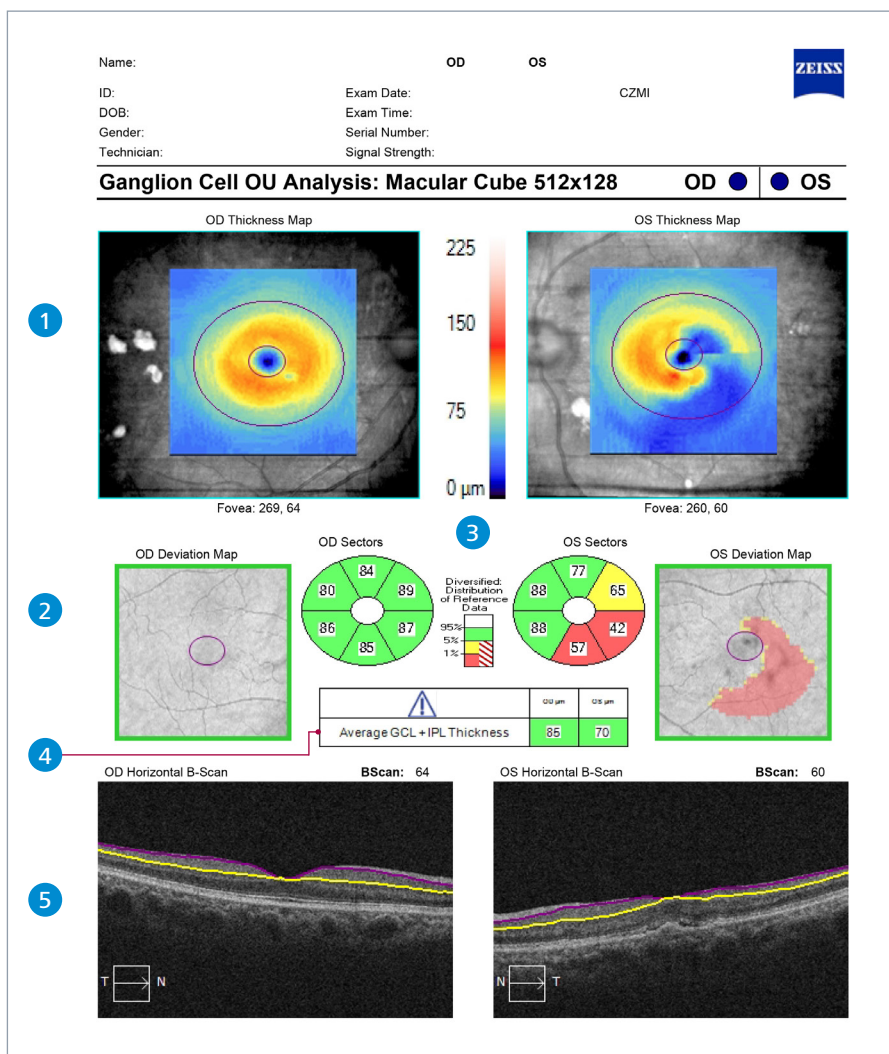
Compared to baseline, decrease detected beyond test repeatability/reproducibility. For Average RNFL, Superior RNFL, Inferior RNFL, Rim Area the values have decreased. For Cup-to-Disc Ratios and Cup Volume values have increased.  
  
 Compared to baseline, increase detected beyond test repeatability/reproducibility. For Average RNFL, Superior RNFL, Inferior RNFL, Rim Area values have increased. For Cup-to-Disc Ratios and Cup Volume values have decreased.

# Ganglion Cell Analysis

## ZEISS CIRRUS OCT

Based on the Macular Cube 512 x 128 or 200 x 200 scan, this analysis provides quantitative and qualitative evaluation of the ganglion cell layer (GCL) plus Inner Plexiform Layer (IPL).

1. **Maps** for GCL + IPL thickness are shown on fundus image. Also shown is the elliptical measurement annulus centered about the fovea.
2. **Deviation Maps** show deviations from normal for GCL + IPL thickness.
3. **Sector maps** divide the elliptical annulus of the Thickness Map into six regions. Values are compared to reference data.
4. **Thickness table** shows average thickness within the elliptical annulus. Values are compared to reference data.
5. **Horizontal B-scans**.



Parameter	Normal Range
Average Thickness	72.9 - 92.5
Temporal-Superior Thickness	72.7 - 92.1
Superior Thickness	73.3 - 94.7
Nasal-Superior Thickness	73.4 - 94.8
Nasal-Inferior Thickness	70.9 - 92.9
Inferior Thickness	69.3 - 90.4
Temporal-Inferior Thickness	72.0 - 91.6

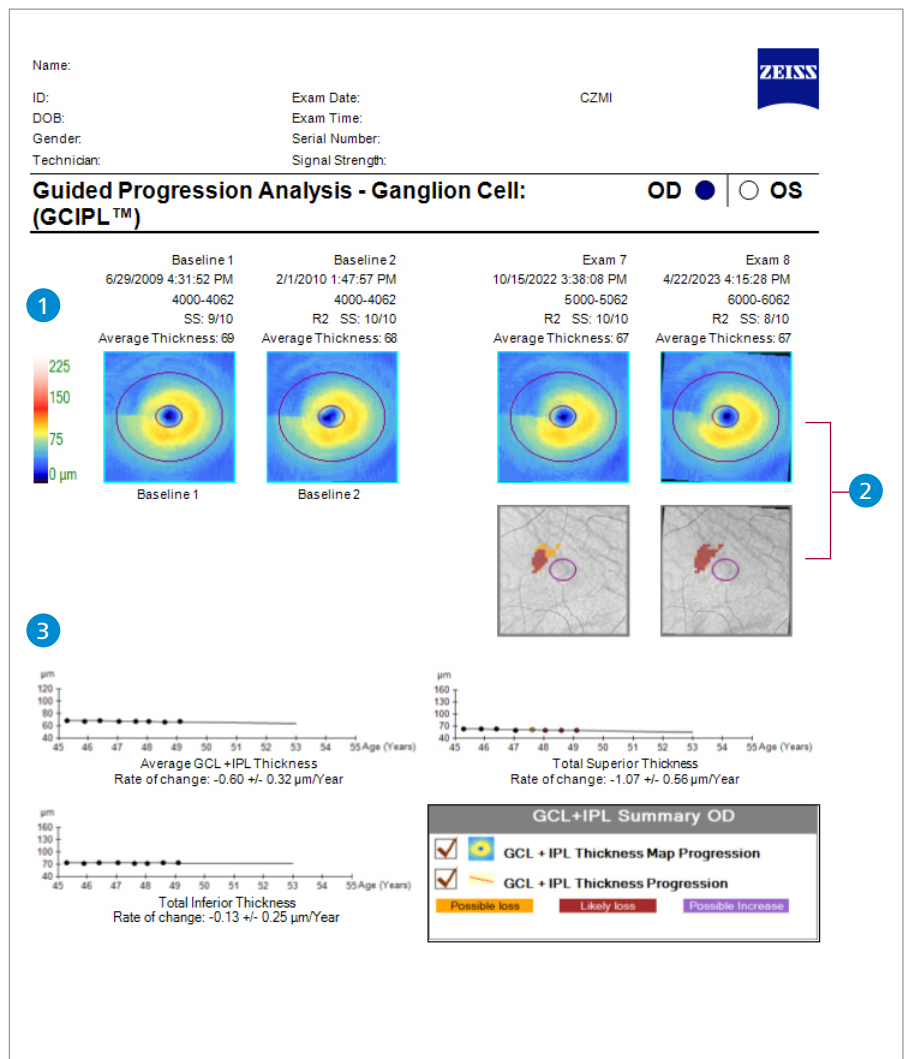
*These values are an example of normal range for a particular age group. Not specific to this patient.*

# GCA Guided Progression Analysis (GPA)

## ZEISS CIRRUS OCT

With **Guided Progression Analysis™ (GPA™)**, CIRRUS can perform event analysis and trend analysis of ganglion cell layer thickness. Event analysis assesses change from baseline compared to expected variability. If change is outside the range of expected variability, it is identified as progression. Trend analysis looks at the rate of change over time, using linear regression to determine rate of change.

- 1. Ganglion Cell Layer plus Inner Plexiform Layer (GCL + IPL) Thickness Maps** provide a color-coded display of GCL + IPL thickness for the two baseline exams.
- The top two images display the GCL + IPL thickness maps for the two most recent exams. Below the thickness maps are the progression maps where areas of change are color-coded orange when first noted and then maroon when the change is sustained over consecutive visits.
- 3. Average GCL +IPL Thickness, Total Superior Thickness, and Total Inferior Thickness** values are plotted for each exam. An orange marker denotes change when it is first noted. A maroon marker denotes change sustained over consecutive visits. Rate of change is shown in text.



# GCA Guided Progression Analysis (continued)

The GCA GPA report includes an optional second page with a table of values, including Average Thickness, Total Superior Thickness, and Total Inferior Thickness. Each cell of the table is color-coded if change is detected.

- 1. Ganglion Cell Layer plus Inner Plexiform Layer (GCL + IPL) Thickness Maps** provide a color-coded display of GCL + IPL thickness for up to 8 exams (including baseline)
- Up to 6 exams are automatically registered to baseline for precise point-to-point comparison. Areas of possible decrease are color-coded orange when first noted and then maroon when the change is sustained over consecutive visits.
- This table includes numerical values for up to 8 exams (including baseline). For each exam there is information on exam date/time, registration method, and signal strength. Average Thickness, Total Superior Thickness, and Total Inferior Thickness values are shown. Each cell of the table is color-coded if change is detected.\*

*\*Note: scans with poor signal strength or obvious artifact should be repeated or excluded from progression analysis to support more reliable clinical decisions.*


Name: \_\_\_\_\_

ID: \_\_\_\_\_ Exam Date: \_\_\_\_\_ EyeClinic

DOB: \_\_\_\_\_ Exam Time: \_\_\_\_\_

Gender: \_\_\_\_\_ Serial Number: \_\_\_\_\_

Technician: \_\_\_\_\_ Signal Strength: \_\_\_\_\_



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**Guided Progression Analysis - Ganglion Cell: (GCIPL™)**

OD  OS

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1

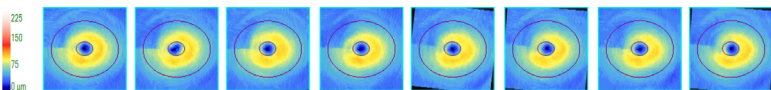
Baseline 1 Baseline 2 Exam 3 Exam 4 Exam 5 Exam 6 Exam 7 Exam 8

225

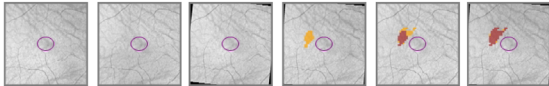
150

75

0 μm



2



3

GCL + IPL Summary Parameters

	Exam Date/Time	Serial Number	Registration Method	SS	Average Thickness:	Total Superior Thickness (μm)	Total Inferior Thickness (μm)
Baseline 1:	1 6/29/2009 4:31:52 PM	4000-4062		9/10	69	64	74
Baseline 2:	2 2/1/2010 1:47:57 PM	4000-4062	R2	10/10	68	63	73
	3 8/3/2010 5:04:07 PM	4000-4062	R2	9/10	69	64	74
	4 4/1/2011 5:16:46 PM	4000-4062	R2	10/10	68	61	74
	5 10/19/2011 5:06:07 PM	4000-4062	R2	10/10	68	62	73
	6 4/2/2012 3:49:06 PM	4000-4062	R2	9/10	67	61	73
	7 10/15/2022 3:38:08 PM	5000-5062	R2	10/10	67	60	74
Current:	8 4/22/2023 4:15:28 PM	6000-6062	R2	8/10	67	61	74

Registration Methods  
R2 - Registration based on translation and rotation of OCT fundus  
R1 - Registration based only on translation of fovea center

Likely Loss

Possible Loss

Possible Increase

Compared to baseline, statistically significant loss of tissue detected. For Average GCL + IPL, Total superior thickness, Total inferior thickness, the values have decreased.

Compared to baseline, statistically significant increase detected. For Average GCL + IPL, Total superior thickness, Total inferior thickness, values have increased.

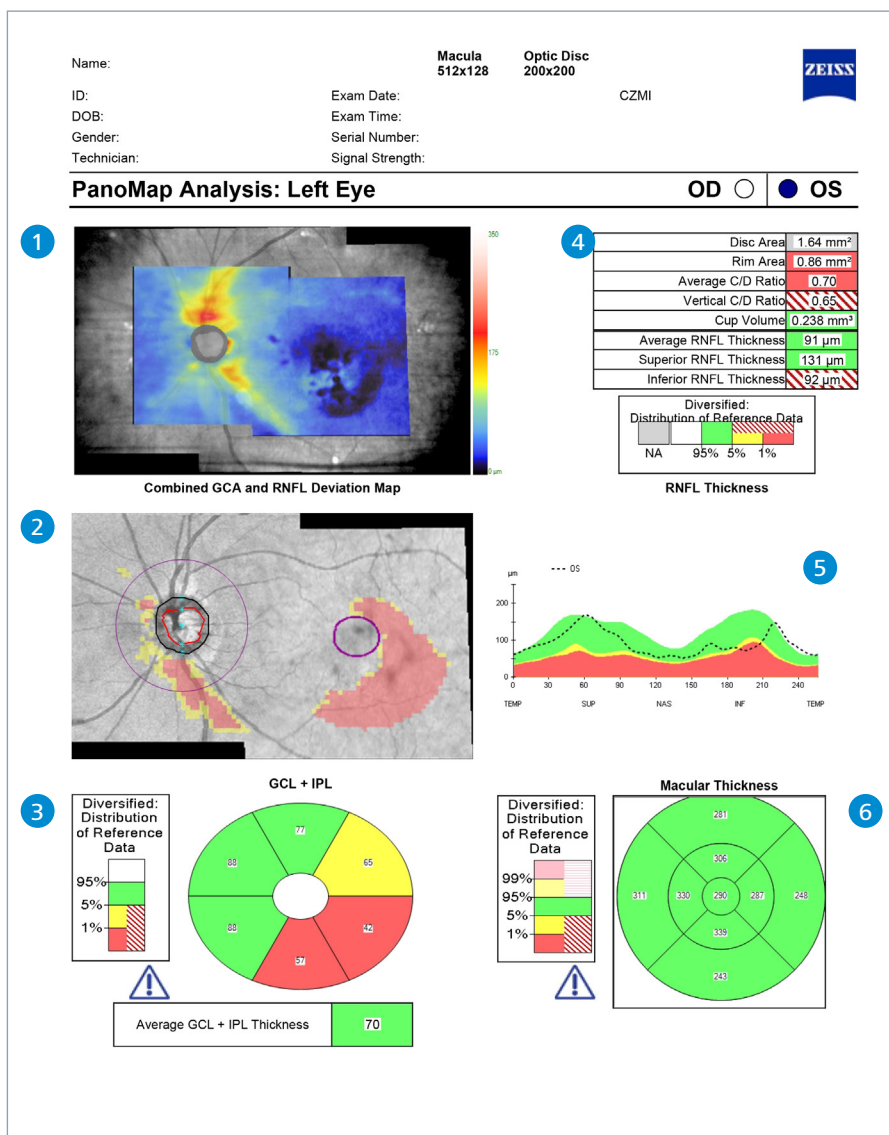
19

# PanoMap Analysis

## ZEISS CIRRUS OCT

The **PanoMap™ Analysis** combines information from the Macular Cube and Optic Disc Cube scans, providing an integrated widefield perspective for comprehensive analysis.

1. The macular and optic disc LSO fundus images are registered and combined. The system automatically finds and processes data from the most recent macular cube and optic disc cube scans acquired on the same day.
2. The RNFL and GCA deviation maps are registered and combined.
3. A sector grid is displayed for GCL + IPL thickness, color coded to correspond with reference data.
4. This table includes RNFL and optic disc parameters with normative data comparison.
5. RNFL thickness graph with normative data comparison.
6. ETDRS grid for macular thickness, color-coded to correspond with reference data.



# ONH Angiography Analysis\* with AngioPlex Metrix

## ZEISS CIRRUS OCT

Optic Nerve Head (ONH) Angiography with AngioPlex® Metrix is a powerful quantitative tool for evaluating optic disc perfusion and can be used together with RNFL, GCA, disc appearance and visual fields etc. to evaluate glaucoma suspects and glaucoma patients. The CIRRUS OCT system captures a 4.5 × 4.5 mm OCT angiography cube focused on the radial peripapillary capillaries (RPC)—the microvasculature that supplies the peripapillary retinal nerve fiber layer (RNFL).

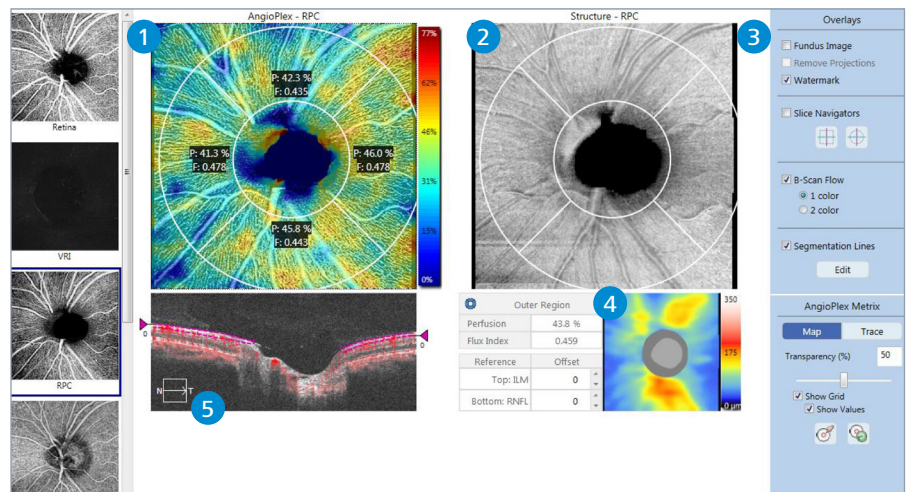
### AngioPlex Metrix calculates two key metrics:

- **Perfusion (P):** Percentage of an area containing perfused vasculature
- **Flux Index (F):** Flow-intensity-weighted perfusion, reflecting average capillary flow signal in perfused pixels

Together, P and F provide objective measures of disc perfusion that may help detect and monitor glaucomatous change when combined with RNFL structural analysis and visual field testing.

### AngioPlex for ONH Analysis Screen (Single Visit)

1. AngioPlex ONH with map and metrics
2. Structural en face
3. Overlay options
4. RNFL thickness map
5. B-scan with blood flow overlay:
  - Red/orange = blood flow
  - Blue = no flow



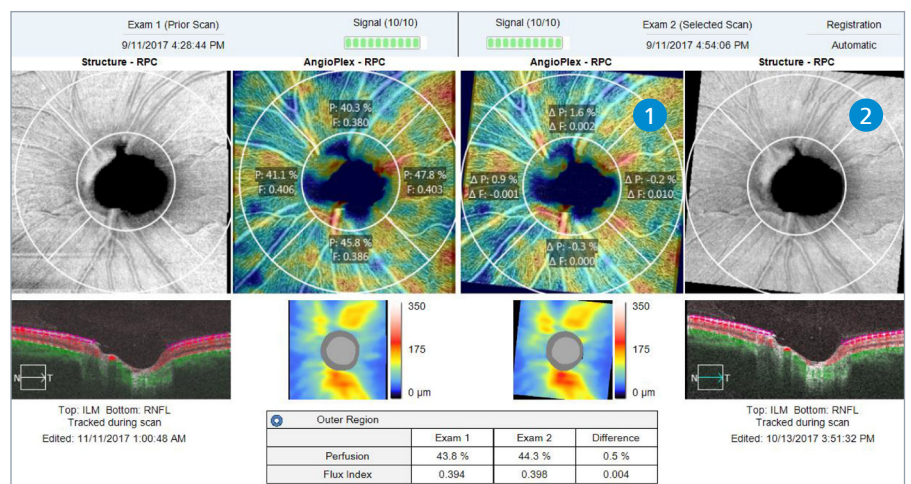
Correlate perfusion pattern with anatomical structure.

### AngioPlex Change Analysis for ONH (two visits)

1. Value difference in AngioPlex Metrix
2. Automatic registration of two visits

#### Change Analysis

Change Analysis compares two visits side-by-side to quantify perfusion and RNFL progression. Example: Superior P 40.3%. F 0.380 on first visit (Exam 1) with Superior:  $\Delta P = +1.6\%$ ,  $\Delta F = +0.002$  shown on right side (Exam 2) demonstrating minimal change between visits.



\*May not be available in all markets

# ONH Angiography Analysis with AngioPlex Metrix (continued)

## AngioPlex Metrix for ONH: Normal vs. Glaucoma vs. Advanced Cases

1. **Normal** shows a Healthy optic disc with excellent vascular perfusion and structural integrity across all sectors.

2. **Glaucoma** inferior quadrant shows substantial loss vs. preserved superior quadrant

P 40.3%, F 0.334 [FOCAL LOSS] and Flux pattern:

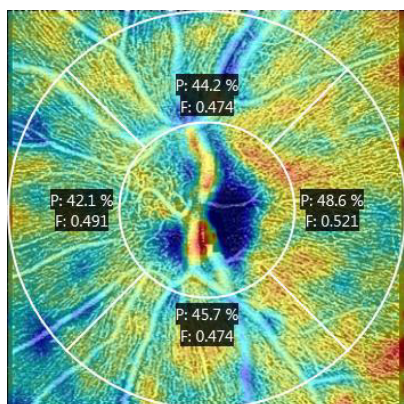
- Inferior F 0.334 (shows severe reduction vs. normal 0.47–0.52).
- Focal perfusion loss in inferior sector matches focal RNFL thinning in the same sector, suggesting early-to-moderate glaucoma with focal sectoral damage.
- The focal-on-focal concordance (perfusion loss + RNFL thinning in same sector) confirms true glaucomatous change, not artifact.

3. **Advanced Glaucoma** illustrates global perfusion loss; no longer focal but diffuse.

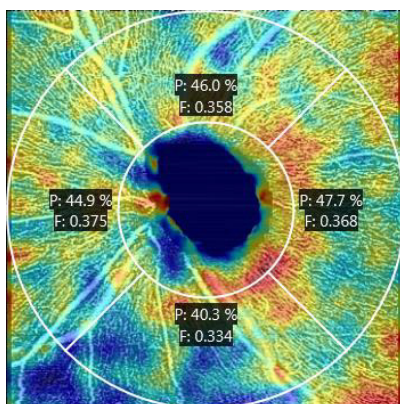
All quadrants below normal:

- P <40% (vs. normal 40–50%) and F values severely reduced: F <0.33 (vs. normal 0.35–0.50).
- Extensive thinning throughout inferior sector; RNFL nearly absent in areas.
- Advanced glaucoma with extensive capillary dropout and irreversible structural damage.
- Global perfusion and structural loss indicate end-stage disease with poor prognosis for functional preservation.

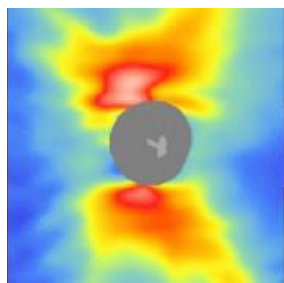
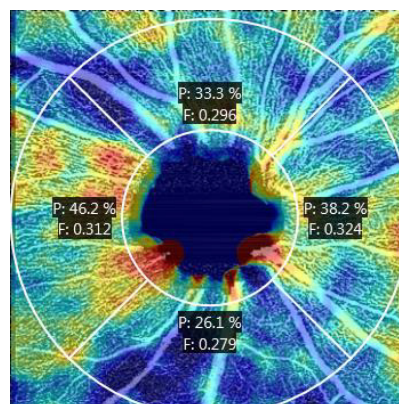
1 Normal



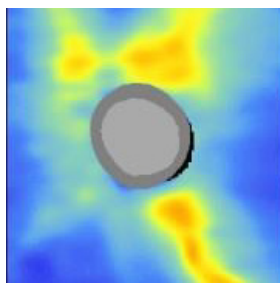
2 Glaucoma



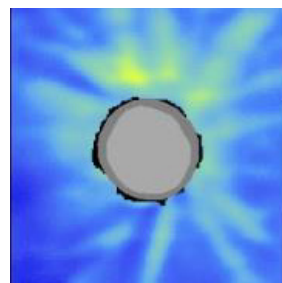
3 Advanced Cases



**Inferior**  
P: 46.6%  
F: 0.476



**Inferior**  
P: 42.0%  
F: 0.338



**Inferior**  
P: 26.1%  
F: 0.279

# Anterior Chamber Analysis

## ZEISS CIRRUS OCT

This scan provides an overview of the entire anterior chamber, allowing assessment and documentation of the cornea, iridocorneal angles, and anterior chamber depth. This expansive 15.5 mm wide view of the entire anterior chamber helps identify patients at risk for angle closure glaucoma.

1. Location of the scan line is shown on the **iris image**. The length and angle of the scan are indicated. A table indicating the Chamber Area Measurement and the Value (mm<sup>2</sup>) is also displayed.
2. **Anterior Chamber scan** is acquired using a full axial field of view that displays an image composed of both the true image data and an inverted mirror image.
3. **B-scan of the anterior chamber.** Note that the mirror artifact data intersects the true data at two places in the cornea. These areas appear as distinctive bars on the image.

Name: \_\_\_\_\_ OS

ID: \_\_\_\_\_ Exam Date: \_\_\_\_\_ CZMI

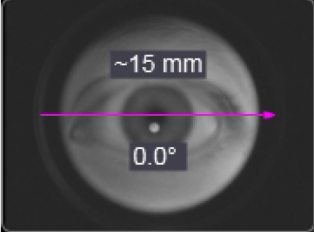
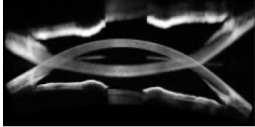
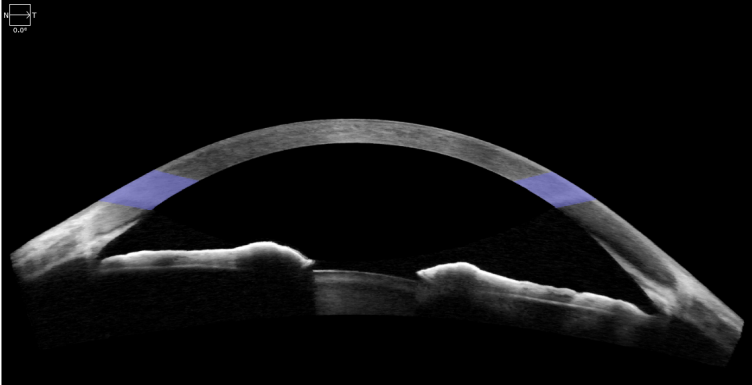
DOB: \_\_\_\_\_ Exam Time: \_\_\_\_\_

Gender: \_\_\_\_\_ Serial Number: \_\_\_\_\_

Technician: \_\_\_\_\_ Signal Strength: \_\_\_\_\_

**Anterior Chamber Analysis : Anterior Chamber** OD  OS

Chamber Measurement	Value
Area	19.77 mm <sup>2</sup>

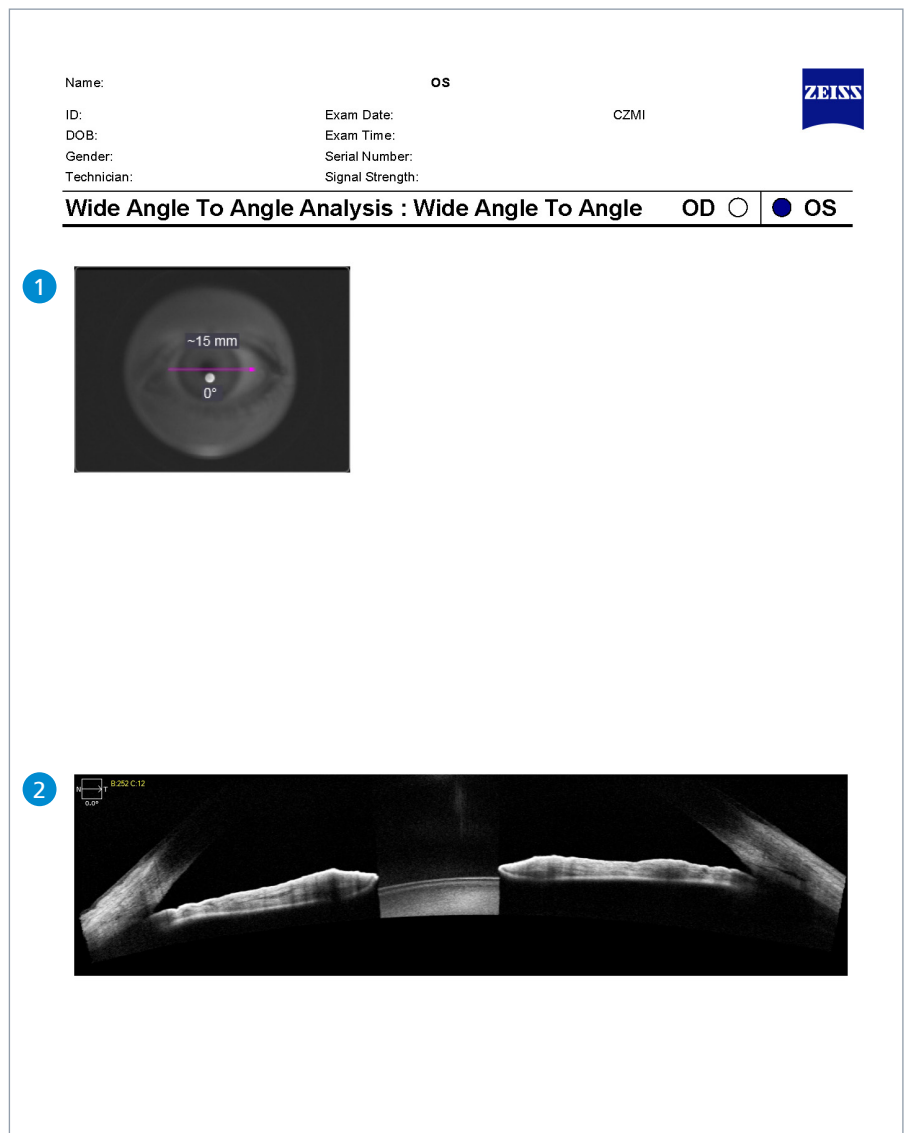
- 1 
- 2 
- 3 

# Wide Angle-to-Angle Analysis

## ZEISS CIRRUS OCT

The Wide Angle-to-Angle scan captures both iridocorneal angles in one scan. Compared to the Anterior Chamber scan, this scan provides higher resolution of the iridocorneal angles and iris configuration for glaucoma evaluation.

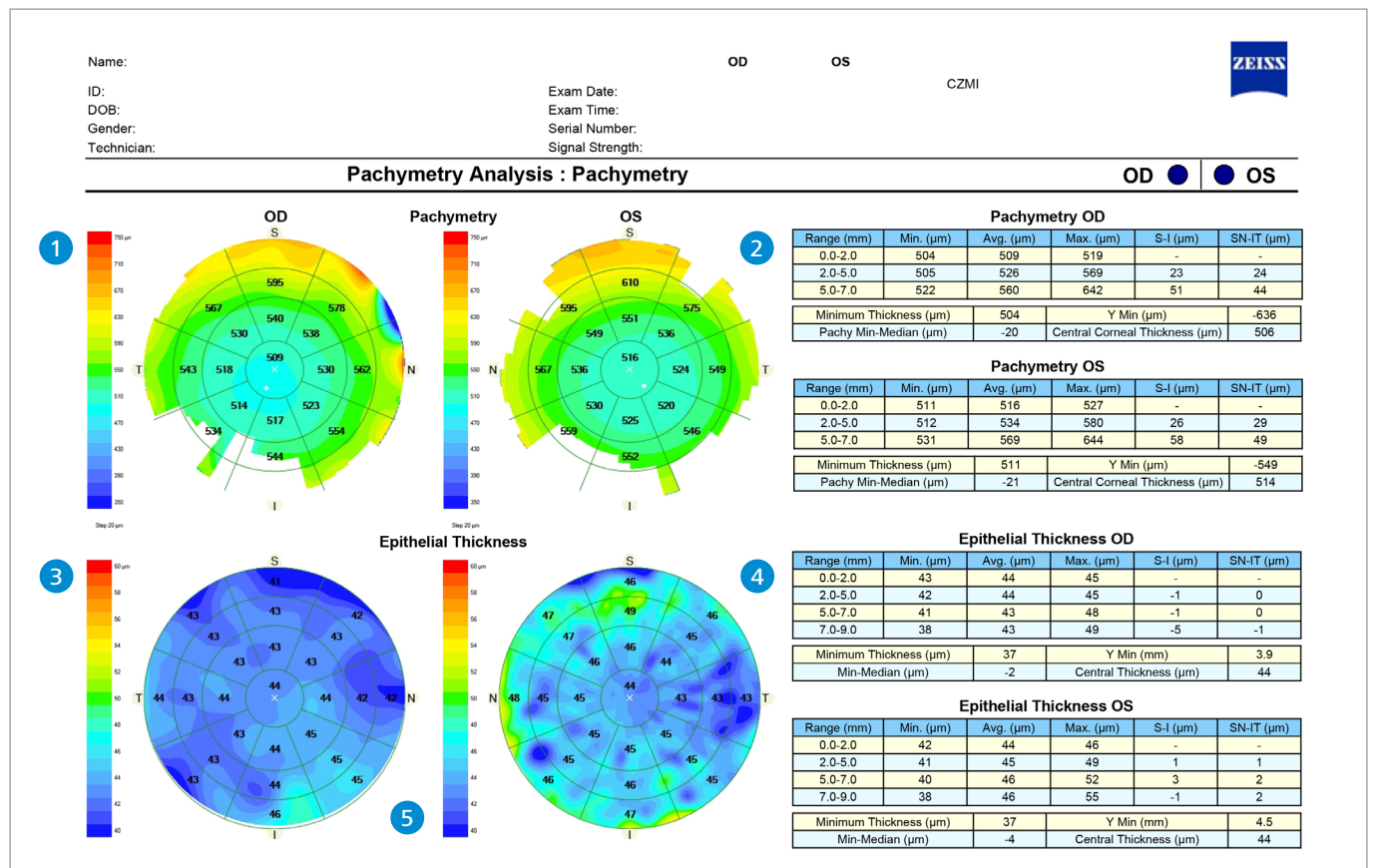
1. Location of the scan line is shown on the **iris image**. The length and angle of the scan are indicated.
2. **High-resolution B-scan** of the iridocorneal angles and iris.



# Pachymetry and Epithelial Thickness Map Report

## ZEISS CIRRUS OCT

The Pachymetry scan uses 24 radial scan lines to generate a color-coded map of the cornea. Pachymetry measurements as well as epithelial thickness measurements are available as part of this analysis.



1. **Pachymetry Map** displays corneal thickness measurements for different zones. The central ring has a diameter of 2 mm, the second ring a diameter of 5 mm, and the outer ring a diameter of 7 mm. The "X" shows the location of the vertex. The white dot shows the location of minimum corneal thickness.
2. **Pachymetry data tables** show the values of each zone, and also include measurements such as S-I (which is calculated by subtracting the inferior value from the superior value).
3. **Epithelial thickness map** shows a grid centered on the corneal vertex (the intersection of the visual axis with the corneal surface). X indicates the vertex. The grid ring diameters are: central ring diameter is 2 mm, inner ring 5 mm, third ring 7 mm and the outer ring 9 mm. The thickness measurements for each sector displays inside the sector. NOTE: Towards the periphery of the cornea, the data may have a lower signal and the boundaries of the surfaces may be difficult to detect. If the algorithm has low confidence in a region, that region does not appear on the map.
4. **Epithelial thickness data tables** provide details of the epithelial thickness within annular ranges. Such as: S-I = average value in the Superior (S) sector - average value in the Inferior (I) sector and SN-IT = average value in the Superior Nasal (SN) sector - average value in the Inferior Temporal (IT) sector.
5. **Color coding options** can be adjusted within analysis. On this report, the standard (default) color coding shows a constant thickness for red at 750 μm and blue at 350 μm.

# HD Cornea and HD Angle

## ZEISS CIRRUS OCT

The HD Cornea scan generates a single high-definition image which can be used for the assessment and documentation of the cornea. The HD Angle scan generates a single speckle-reduced raster scan which is used for the assessment and documentation of the anterior chamber angle.

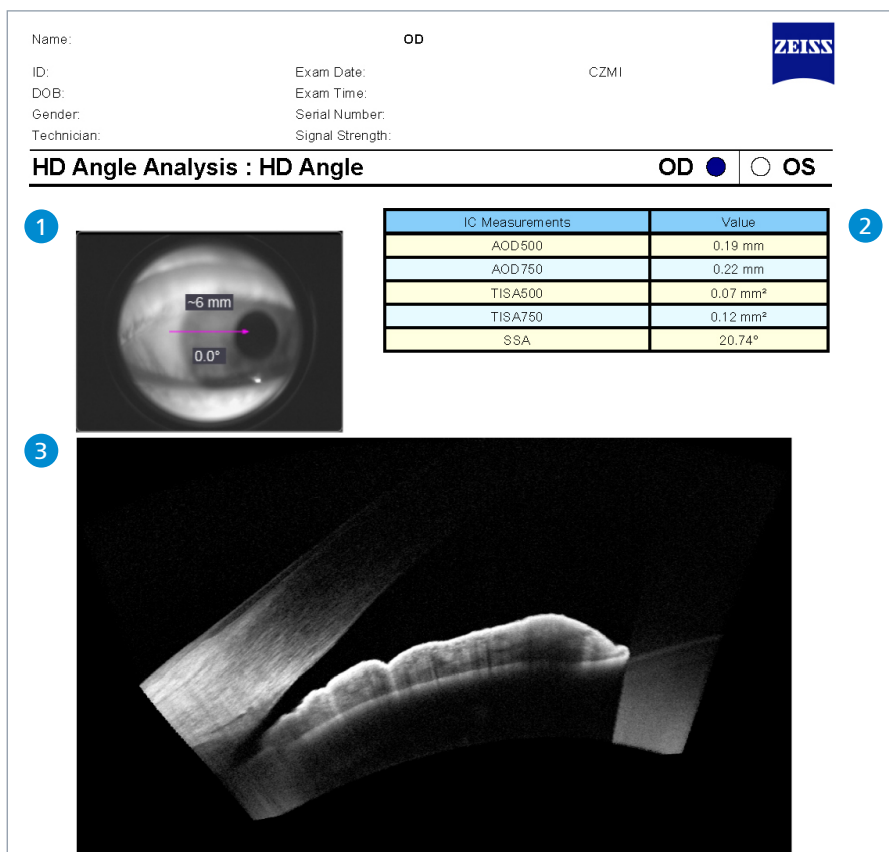
### HD Cornea

1. The Scan angle is adjustable. Parameters for the scan are indicated in the image. Location of scan line is shown on the iris image.
2. The B-scan is composed of **20 line scans**. The scan is 9.0 mm in length when oriented horizontally, and has a depth of 2.0 mm.



### HD Angle

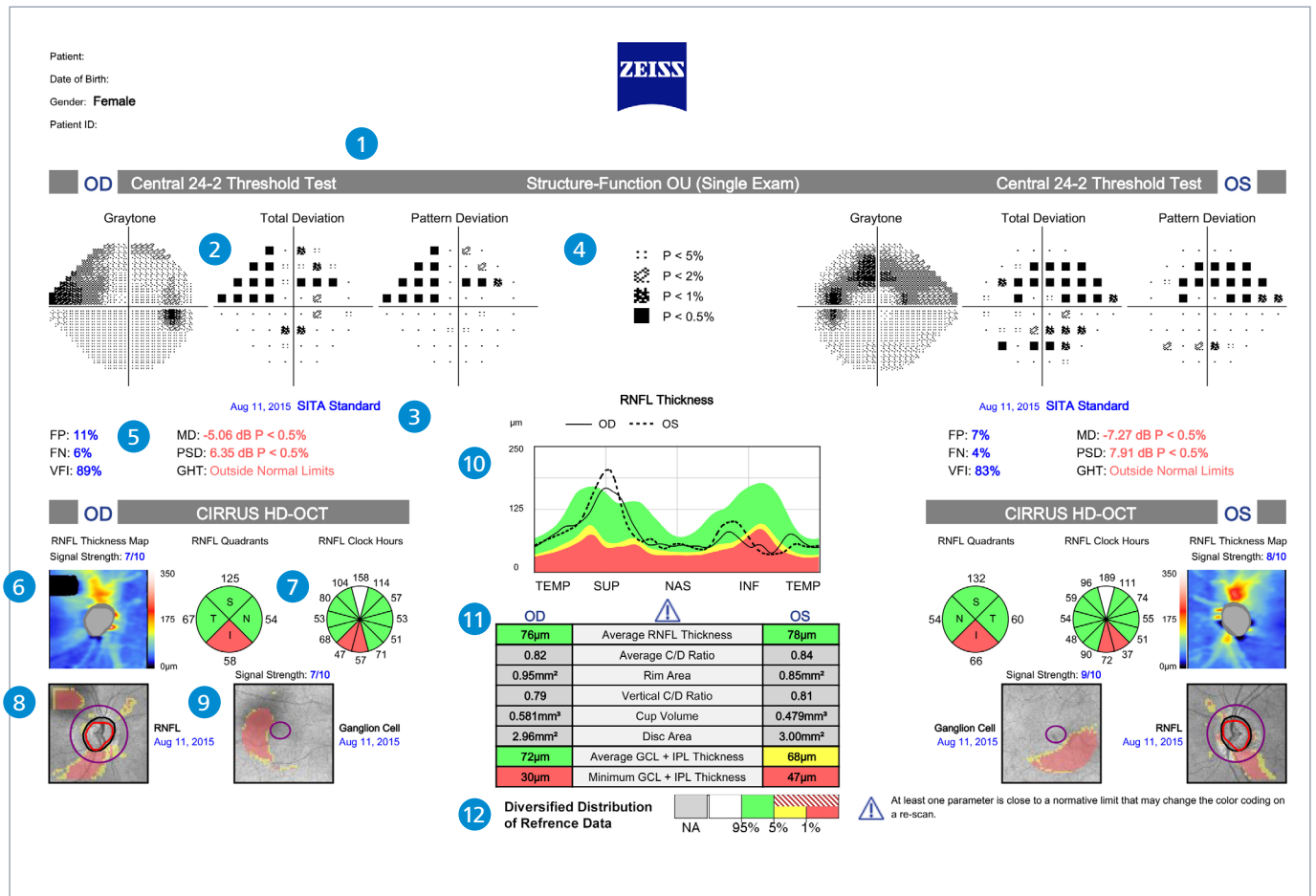
1. The Scan angle is adjustable. Parameters for the scan are indicated in the image. The location of the scan line is shown on the iris image.
2. Iridocorneal (IC) Angle Tool measurements include the angle opening distance (AOD) at 500  $\mu\text{m}$  and 750  $\mu\text{m}$ , trabecular iris space area (TISA) at 500  $\mu\text{m}$  and 750  $\mu\text{m}$ , and the scleral spur angle (SSA). These values are generated from the dimensions of the IC angle tool.
3. The speckle-reduced raster scan is composed of **20 B-scans**. The scan is 6.0 mm in length, and has a depth of 2.9 mm.



# HFA-CIRRUS Structure-Function Report

## ZEISS CIRRUS OCT

Available exclusively with the ZEISS Glaucoma Workplace, the Structure-Function report is generated automatically from CIRRUS OCT and HFA™ data. It provides a summary of structural and functional exams on a single page. Depending on the type of exam data available, different Structure-Function reports can be generated.



### HFA Visual Field Section

1. HFA Test Pattern
2. HFA Grayscale and Deviation Plots
3. HFA Test Strategy
4. Probability Legend
5. HFA Reliability and Global Indices

### CIRRUS OCT Section

6. RNFL Thickness Map
7. RNFL Quadrants and Clock Hours
8. RNFL Deviation Map
9. Ganglion Cell Deviation Map
10. RNFL Thickness Profile
11. RNFL and Optic Disk Parameters
12. Key to Distribution of Reference Data

CE 0297



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