# 6 reasons why you don’t need Swept Source OCT!

optovue

# 6 Reasons...

- Very high cost (when actually available)
- Lower resolution in tissue
- Choroid scanning & measurement already available in Avanti
- Higher speeds still don’t correct for motion artifacts
- Avanti Widefield SD-OCT is FDA cleared now!
- Already demonstrated longer acquisition and processing times for OCTA than AngioVue

AngioVue is not FDA cleared for sale in the US

# The Cost

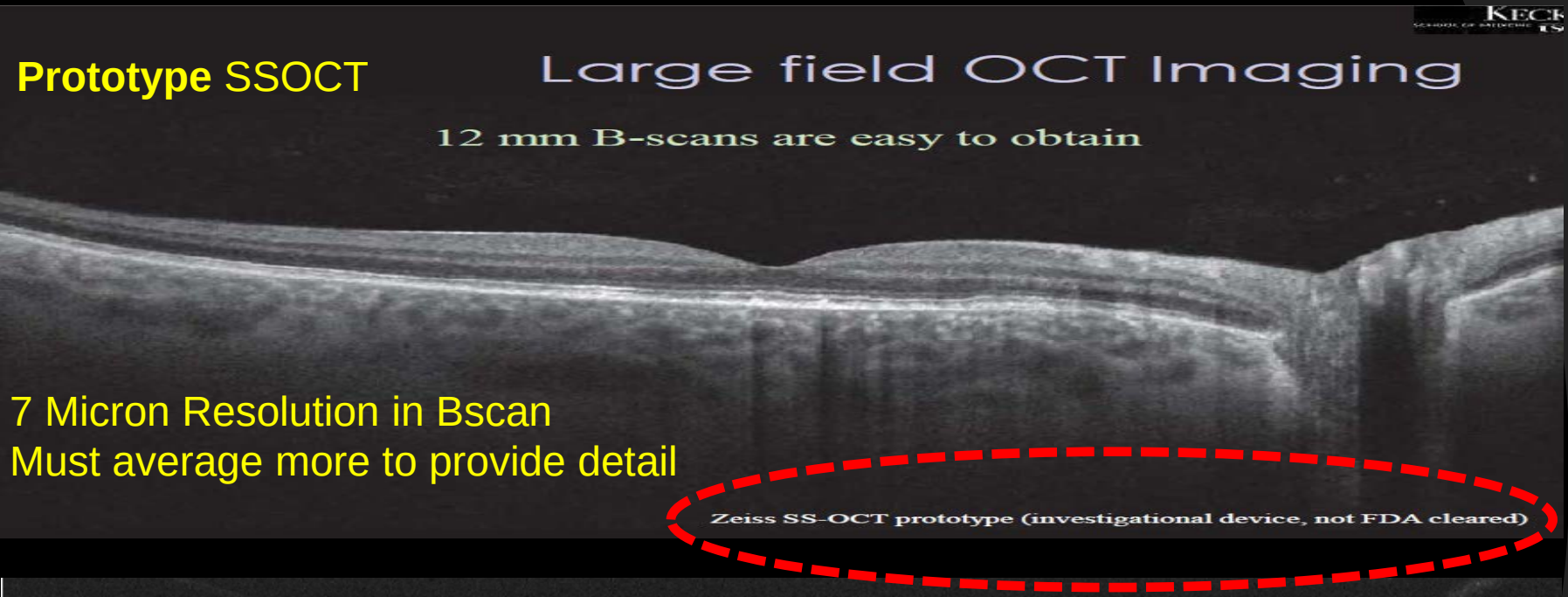
- Estimated cost range $120-$140,000 for SS-OCT
- OCT Angiography will add an additional cost:
- Final cost for SS-OCT with OCTA could be……. $150,000

- Known cost range $60-$65,000 for SD-OCT
- Estimated $25-35K for SDOCT..

* Is SS-OCT worth the extra cost?  Lets see….

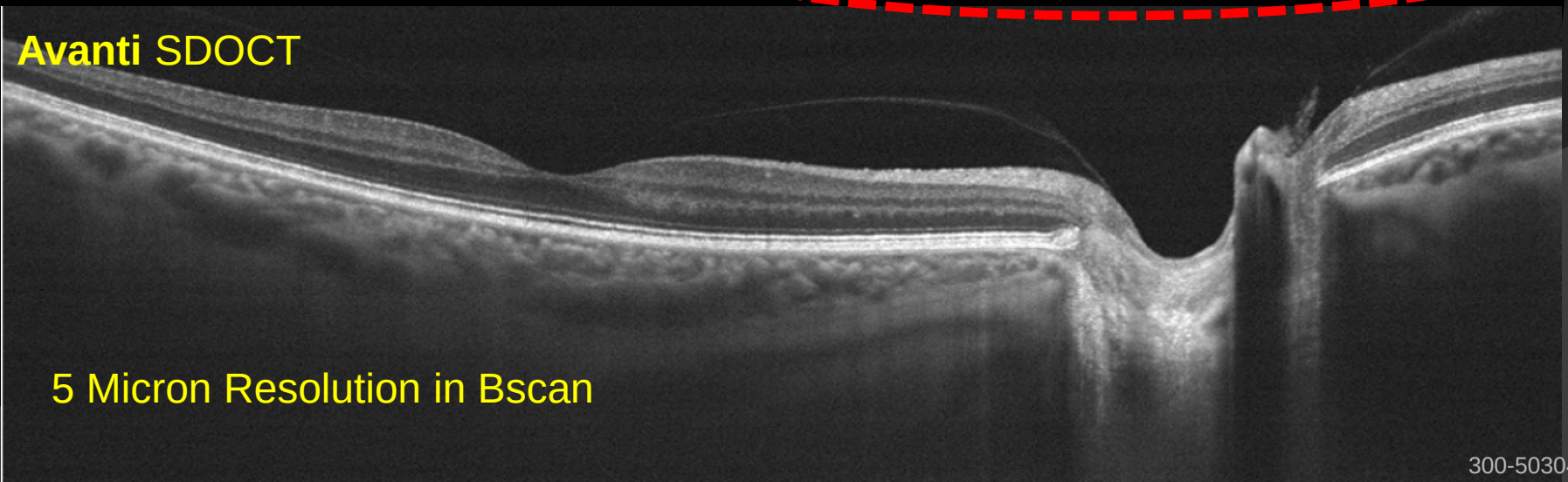
# Less resolution in tissue

**Prototype** SSOCT



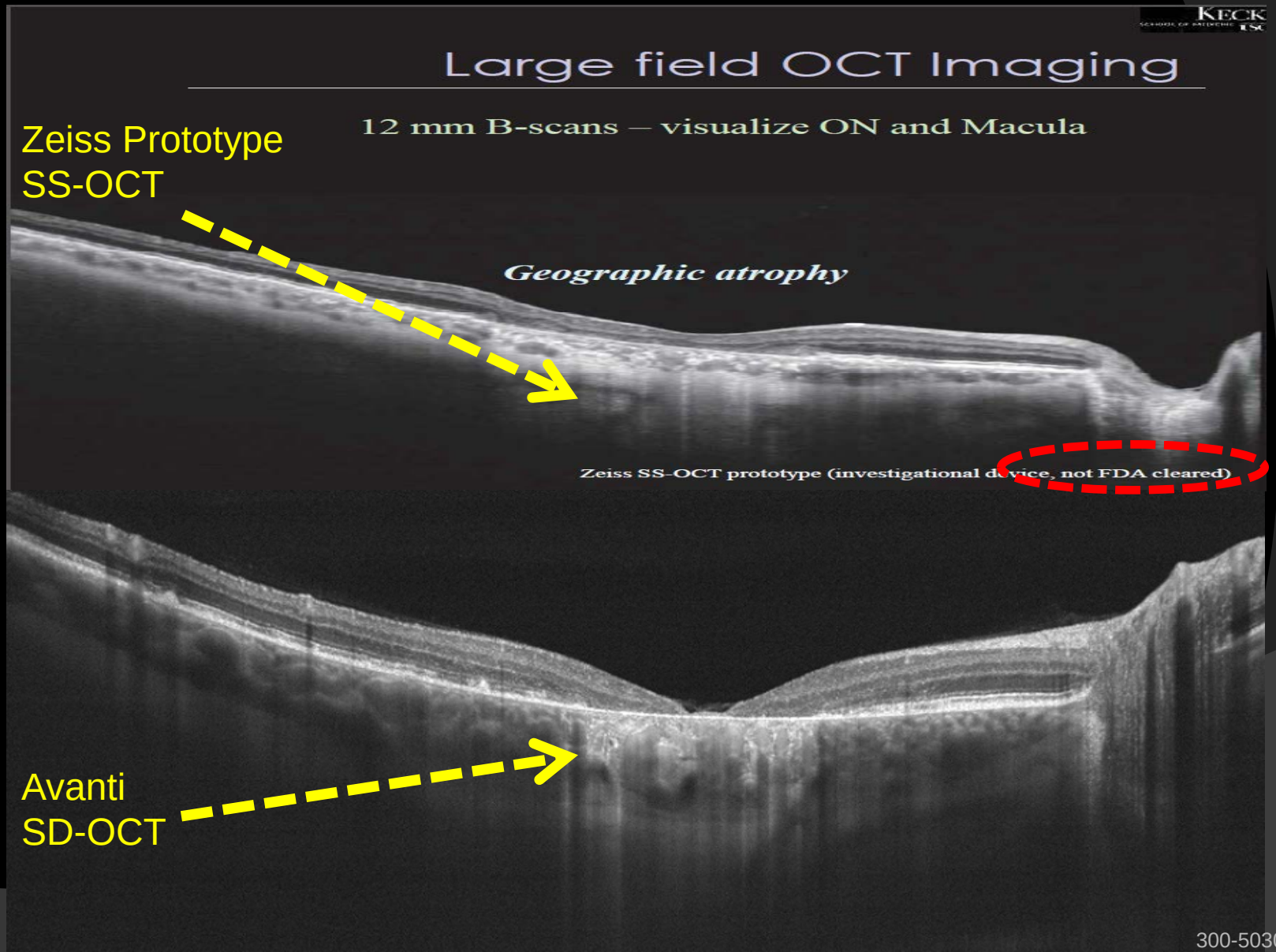

7 Micron Resolution in Bscan
Must average more to provide detail

**Avanti** SDOCT

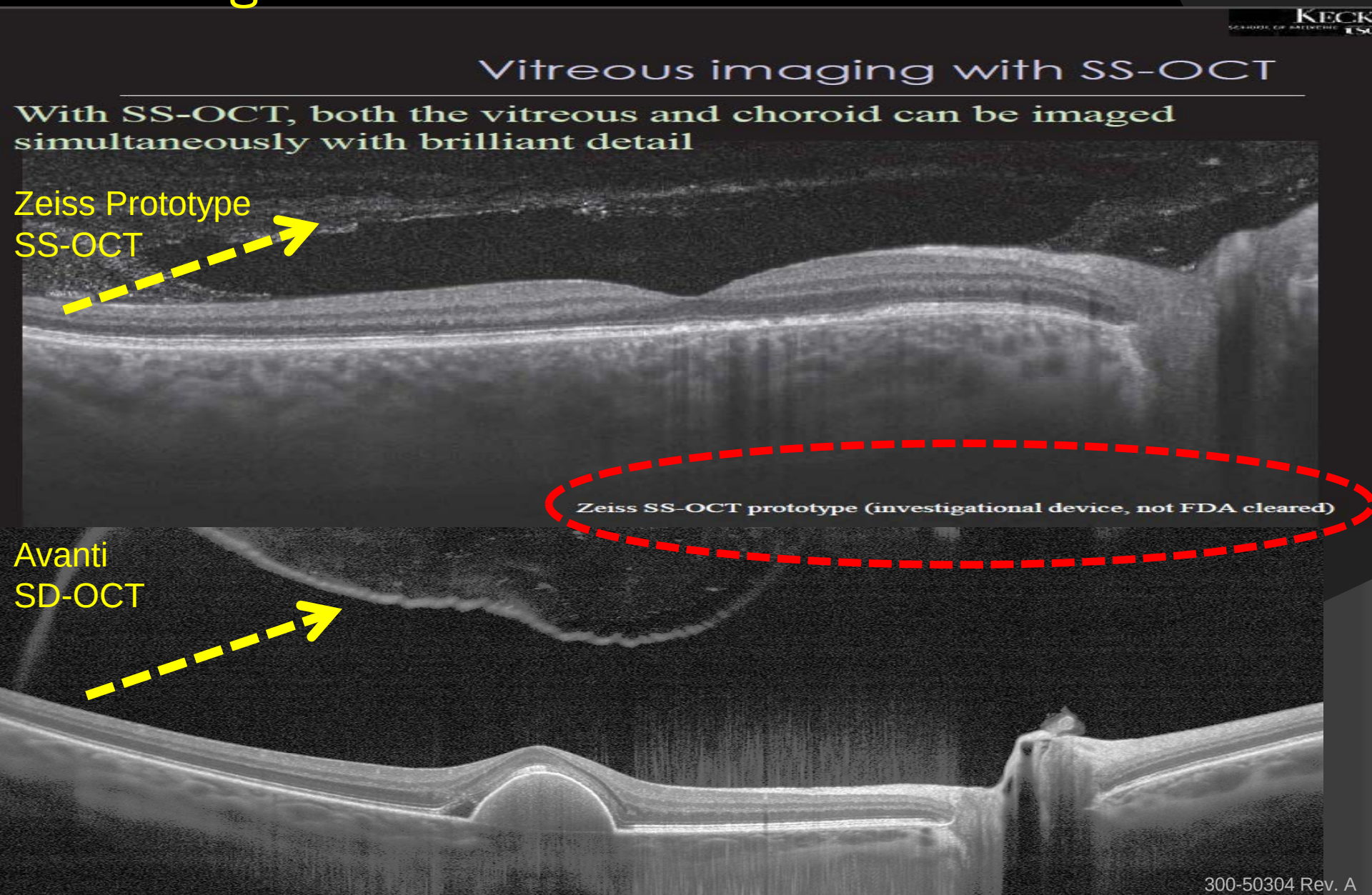


5 Micron Resolution in Bscan

# Avanti already shows good detail in choroid



# Swept Source VS SD-OCT (Avanti already gives great detail in the vitreous & choroid



# SS-OCT speed alone will not correct for eye motion artifacts. Only Optovue has MCT to minimize the effect of movement

Zeiss SSOCT Prototype

**Avanti/AngioVue SD-OCT with MCT**

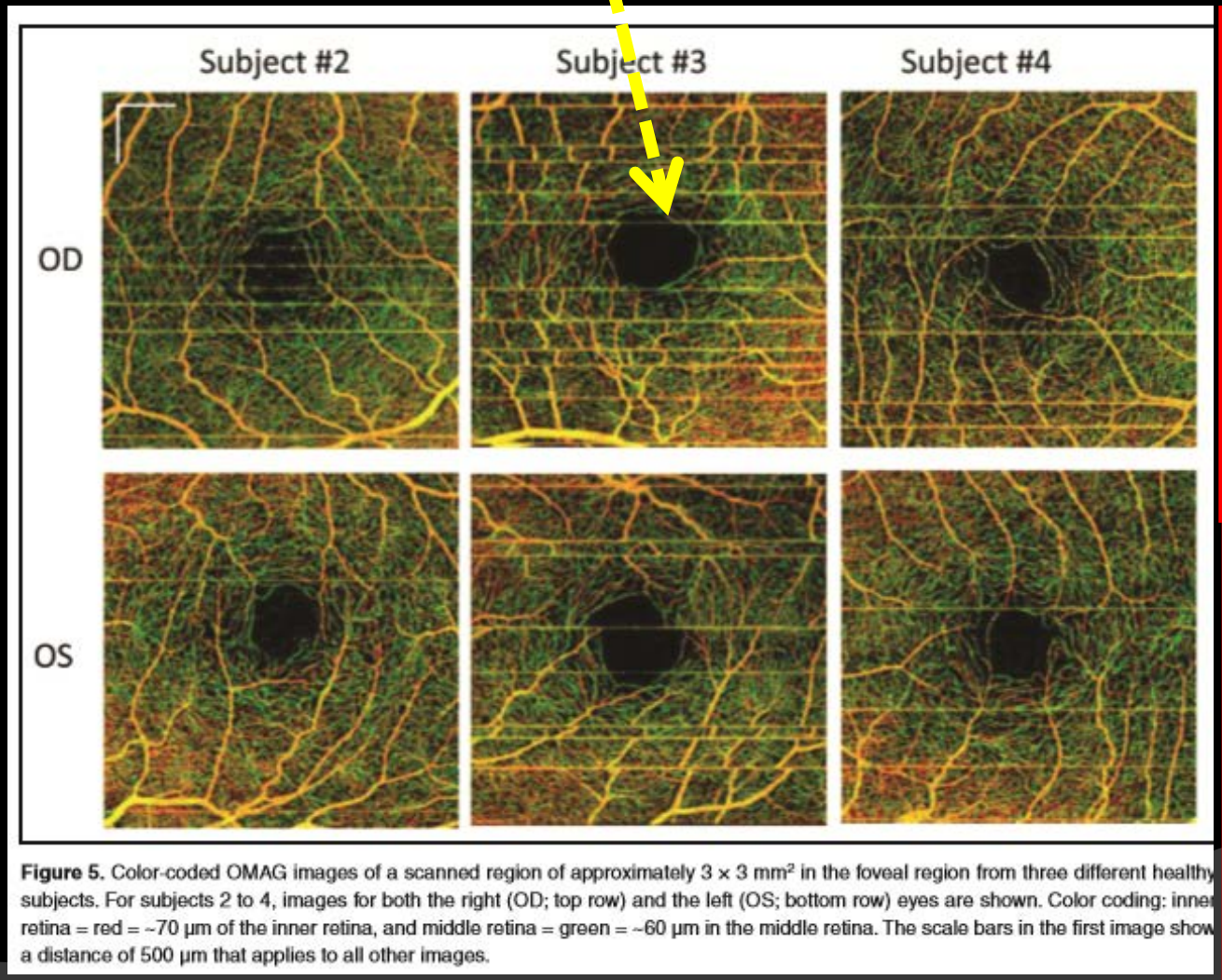
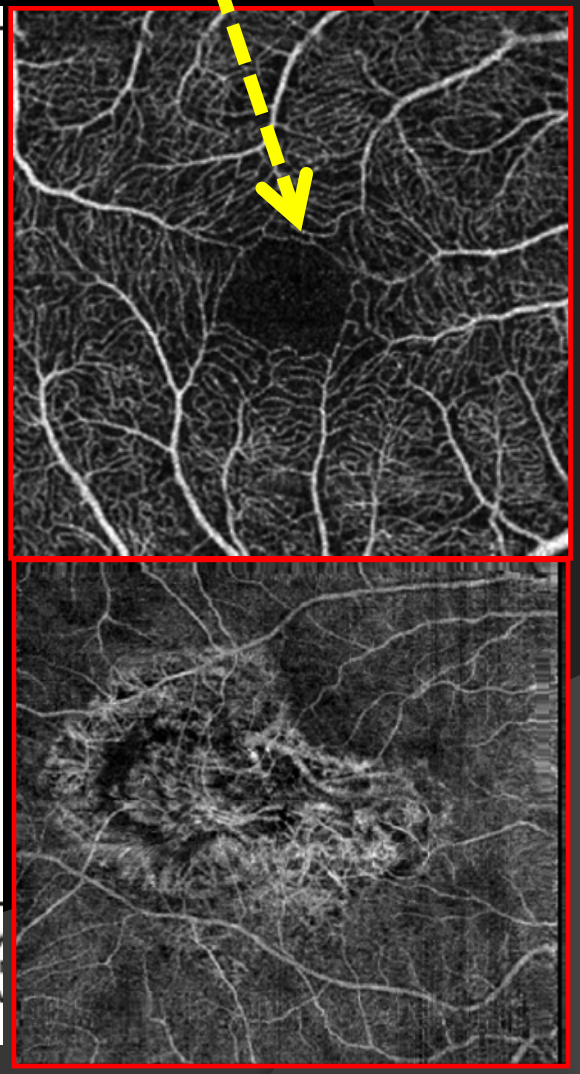
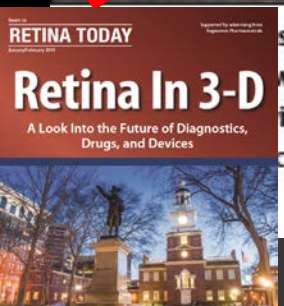



**Figure 5.** Color-coded OMAG images of a scanned region of approximately 3 × 3 mm² in the foveal region from three different healthy subjects. For subjects 2 to 4, images for both the right (OD; top row) and the left (OS; bottom row) eyes are shown. Color coding: inner retina = red = ~70 µm of the inner retina, and middle retina = green = ~60 µm in the middle retina. The scale bars in the first image show a distance of 500 µm that applies to all other images.

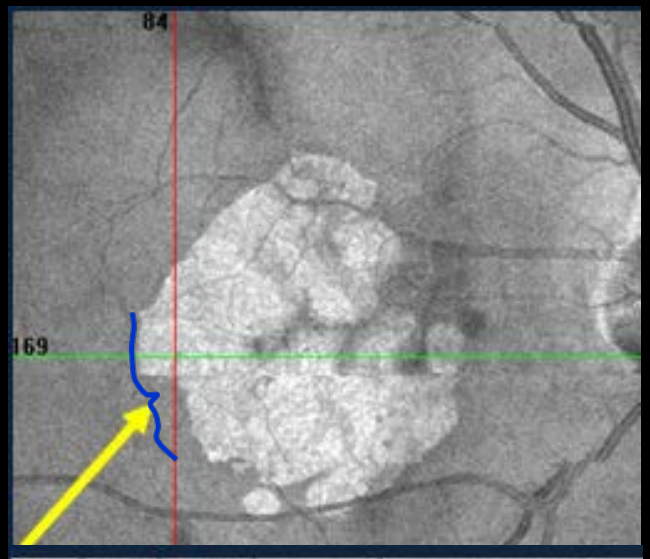


AngioVue is not FDA cleared for sale in the US

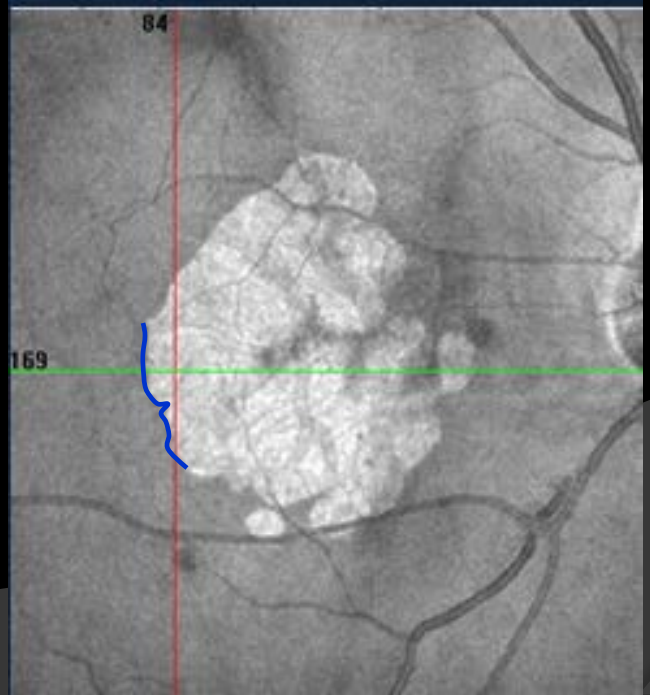
# SS-OCT speed alone still will not correct for eye motion artifacts – SS-OCT still needs MCT to minimize the effects of movement




ssels within a pigment epithelial detach-
with neovascular AMD revealed by en face
ith a prototype SS-OCT devi e (Carl Zeiss
leared).




No MCT

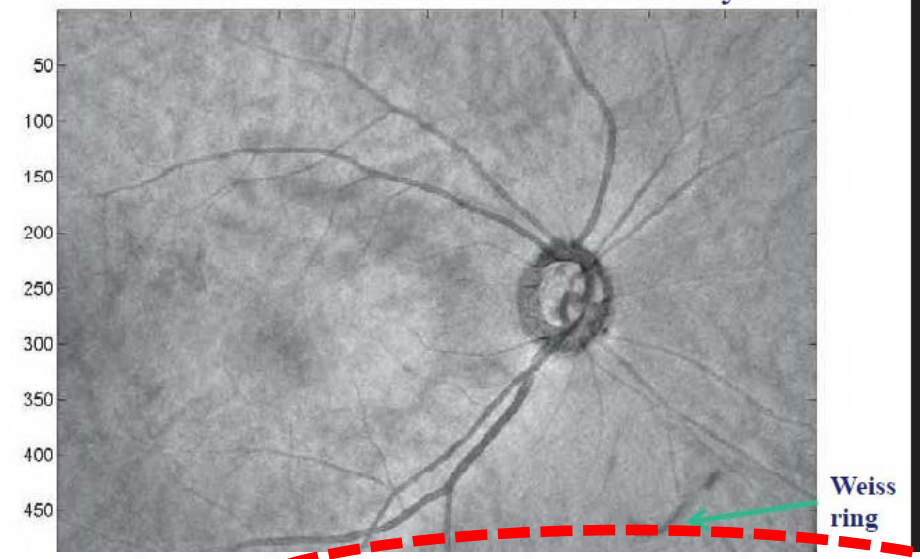



MCT

# Our **Wide Field OCT** is FDA cleared NOW!

## Large field OCT imaging

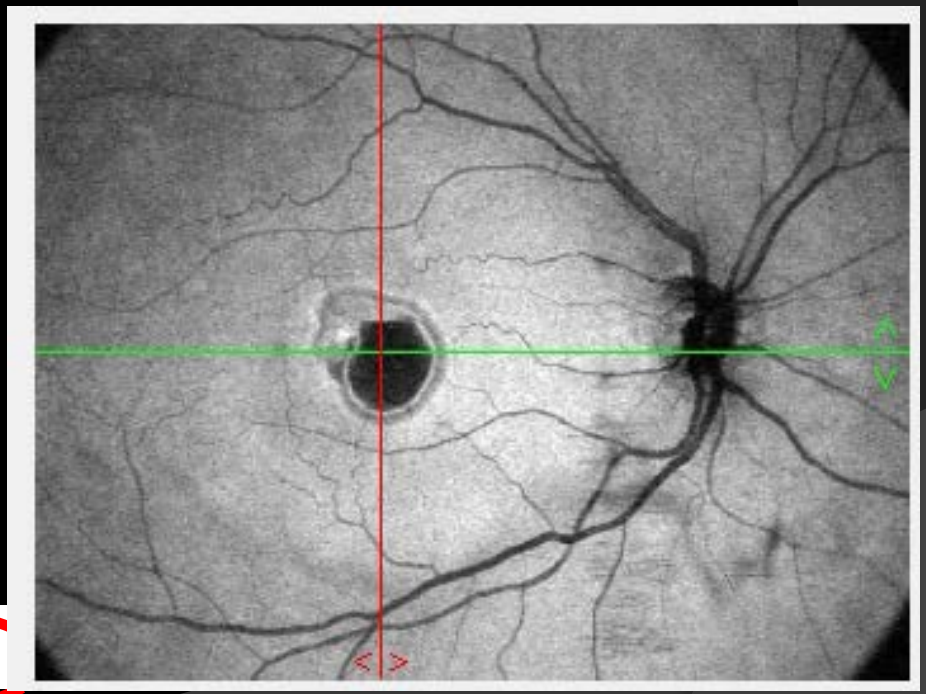
12 x 9 mm volume scans are also easy




Zeiss SS-OCT prototype (investigational device, not FDA cleared)

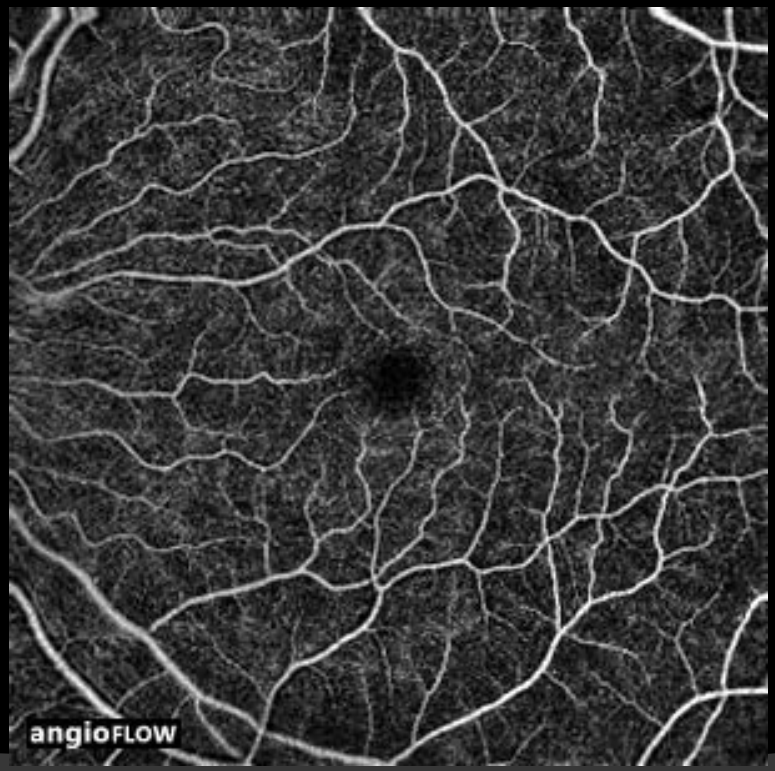
Zeiss SS-OCT prototype (investigational device, not FDA cleared)

Avanti - FDA Approved for sale now

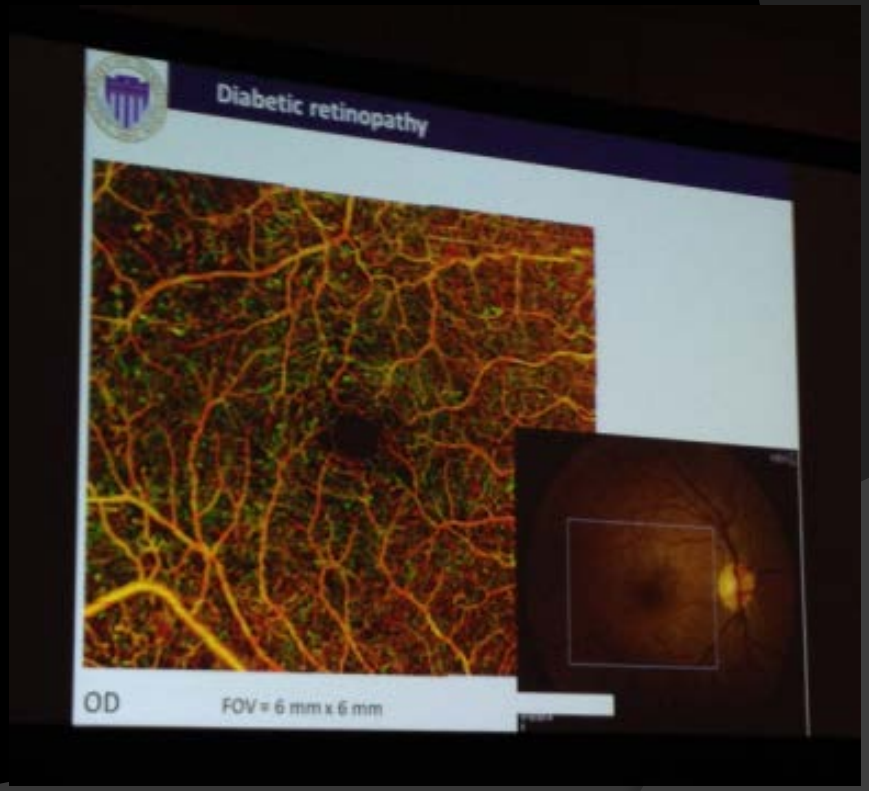


# Longer processing times

Avanti/AngioVue 8X8
Available now internationally
No montage needed
10 second processing time



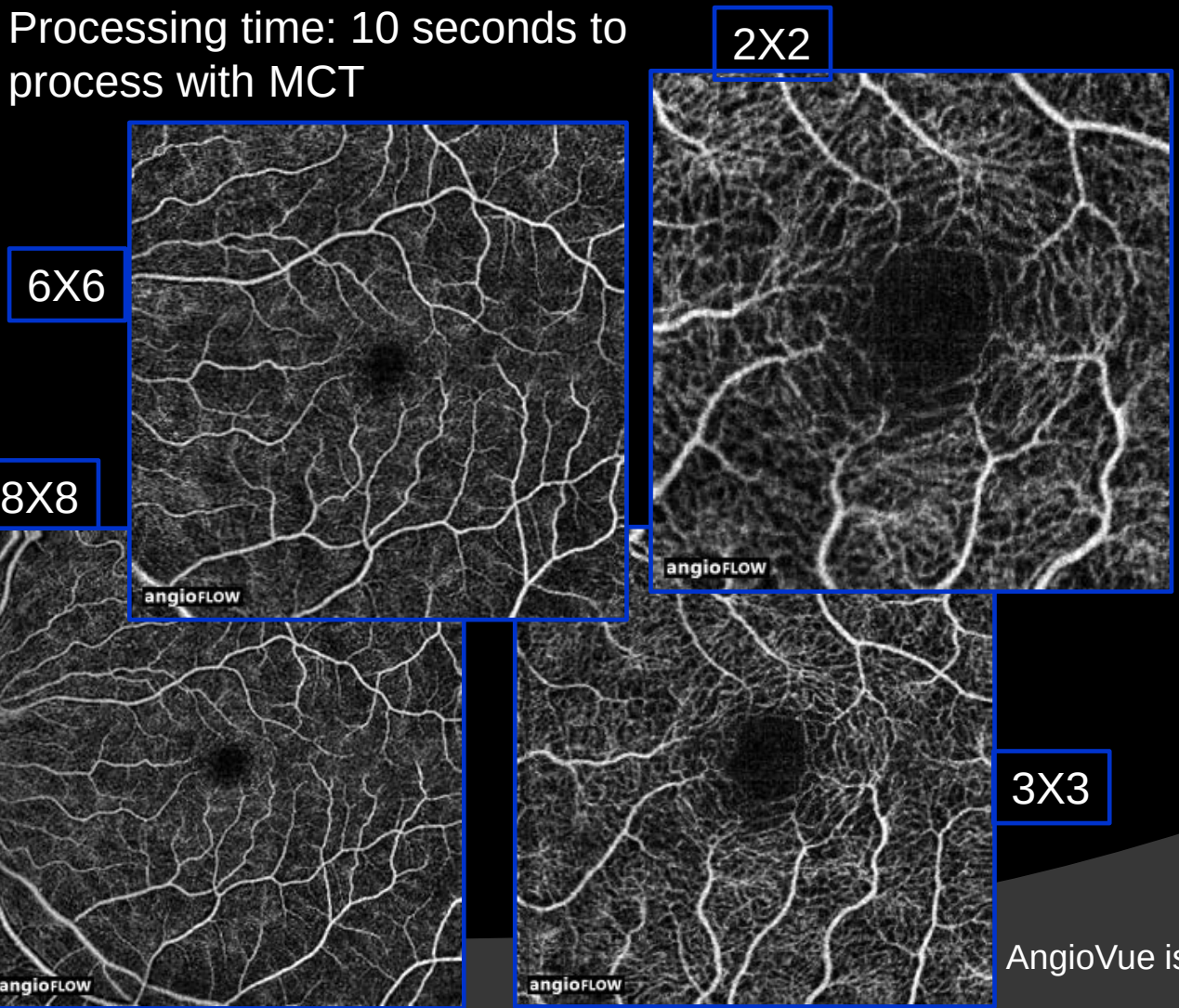

Zeiss prototype 6X6
Not commercially available
Image created using montage
2 minutes estimated processing



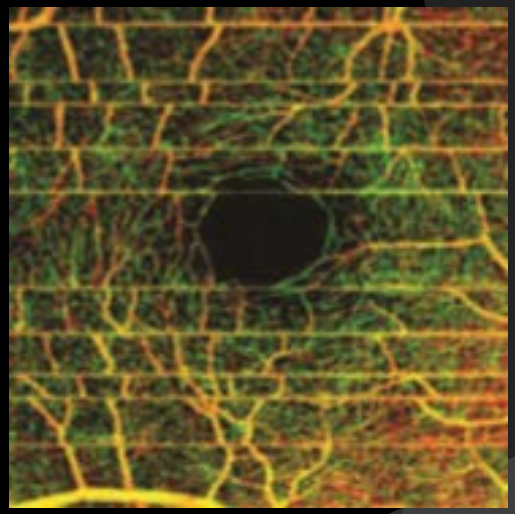

AngioVue is not FDA cleared for sale in the US

# Longer Acquisition & Processing Times

Total capture time: 3 seconds/cube
304 A scans X 304 B scans per cube
Processing time: 10 seconds to process with MCT




Total capture time: 4.5 seconds
300 A scans X 300 B scans cube
Processing time: Estimated Several Minutes



3X3 only one size from Zeiss

AngioVue is not FDA cleared for sale in the US

# Key Conclusions...

- The increased speed alone from SS-OCT is still not enough to remove eye movement.
  - MCT is also needed and ***only*** available from Optovue.

- The Avanti is FDA cleared & produces wide field enface images now.

- Avanti already provides excellent vitreous & choroidal detail

- No economic or clinical reason for SS-OCT
  - Higher cost of SS-OCT is simply not justified.
  - No additional clinical information is provided by SS-OCT.
  - Acquisition and processing times are longer for OCTA
    - *Not viable in the clinical environment on real patients*.

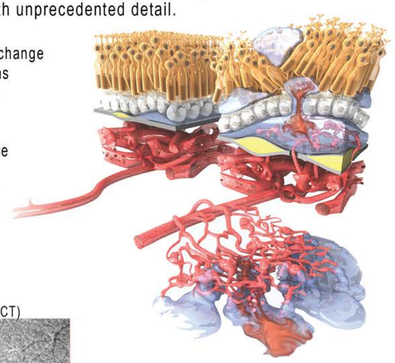
AngioVue is not FDA cleared for sale in the US

# OCT-ANGIOGRAPHY (OCTA)

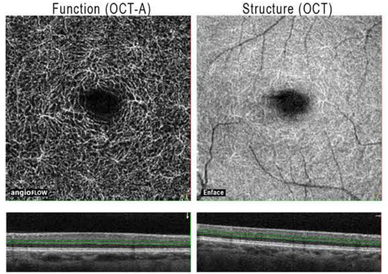
With **OCT Angiography**, clinicians have a new way of visualizing the presence of ocular blood flow in the vessels. OCTA enables clinicians to assess perfusion in the retina and the effect of ocular disease with unprecedented detail.

**CONVENTIONAL OCT** can visualize structural change such as the presence of drusen, fluid, elevations or disruptions in retinal layers. It is not able to visualize changes in the microvasculature.

**OCT-ANGIOGRAPHY** can visualize the presence of ocular flow in the vessels. therefore, it may help the clinician identify changes in the micro-vasculare such as choroidal neovascularization associated with wet AMD*



Function (OCT-A) Structure (OCT)



## FUNCTION & STRUCTURE IN A SINGLE POWERFUL SYSTEM

The AngioVue dual-modality imaging feature allows the user to capture both functional and structural information with a single scan. A powerful advanced OCT system and OCT-Angiography in one device.

## THE UNIQUE COMBINATION OF ADVANCED AND PATENTED TECHNOLOGIES

Five essential technologies (including three covered by Patents) are combined to create AngioVue and provide high contrast, detailed enface images of selected layers within the retina, in just a few seconds


*Jia Y, Bailey S, Wilson D, et al., Quantitative OCT angiography of CNV in age-related macular degeneration. Ophthalmology 2014; 121:1435



# AngioVue

***Non-invasive*** **Enhanced Microvascular Imaging**

## OCTA SPECIFICATIONS

AngioVue image size: 304 x 304 pixels
Total acquisition time (per group): less than 3 seconds

AngioVue scan sizes (Retina):
- 3 mm x 3 mm
- 6 mm x 6 mm
- 8 mm x 8 mm

AngioVue Scan size (Optic Disc):
- 3 mm x 3 mm
- 4.5 mm x 4.5 mm

## SYSTEM SPECIFICATIONS

OCT Camera: 70,000 A-SCAN/SECOND
Optical Resolution: (in tissue)
- Axial Resolution: 5 microns
- Transverse: 15 microns

Image Sampling Rate:
- Digital: 3 microns

Scan Range:
- A-scan Depth: ~3mm
- Transverse: 2mm to 12mm

Scan Beam Wavelength:
- λ=840nm

Exposure Power at pupil: 750mW maximum
Patient Interface:
- Working Distance: 22mm
- Motorized Focus Range: -15D to +20D

Computer:
- CPU: i7, 3.22 GHz, Windows 7 64bit
- RAM: 16 GB
- Hard Disk: 2 TB
- Back-up Hard Disk: 2 TB

## THE ANGIOVUE PLATFORM UPGRADE

Convert your existing Avanti Widefield OCT to the AngioVue Dual-Modality Imaging System platform. AngioVue integrates non-invasive enhanced microvascular imaging - Optovue's proprietary OCTA-based technology platform - with your existing Optovue high-speed, wide field, en face OCT technology platform

## OPTOVUE INNOVATIONS

Retina ► 2-Phase Noise Reduction, Choroid Measurement, Widefield Enface, OCT-Angiography
Glaucoma ► Ganglion Cell Complex Analysis, Focal Loss Volume, Global Loss Volume, OCT-Angiography
Cataract/Refractive ► Total Cornea Power, Epithelium Mapping

optovue
THE OCT COMPANY

International use only. AngioVue is not available for sale in the USA

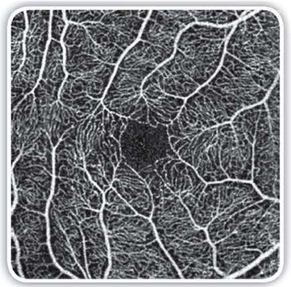
Optovue, Incorporated | 2800 Bayview Drive, Fremont, CA 94538 USA | PH: +1 510.623.8868 | FX: +1 510.623.8668

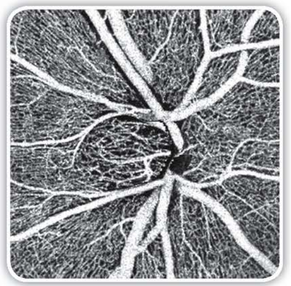
Part No. 300-50394 Rev. B

optovue
THE OCT COMPANY

# AngioVue™

**Enhanced Microvascular Imaging**





International use only. AngioVue is not available for sale in the USA

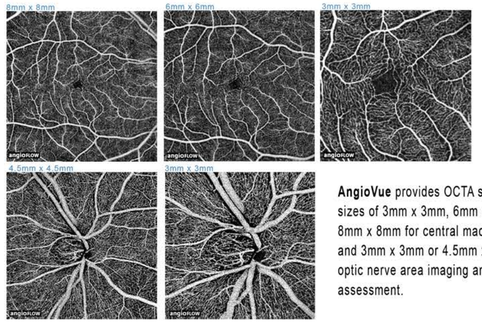
# System

## ANGIOVUE: DUAL-MODALITY OCT SYSTEM

The **AngioVue Enhanced Microvascular Imaging** systems is the only commercially available OCTA system capable of imaging both structure (OCT), and function (OCTA) in a fast, simple and repeatable non-invasive procedure.

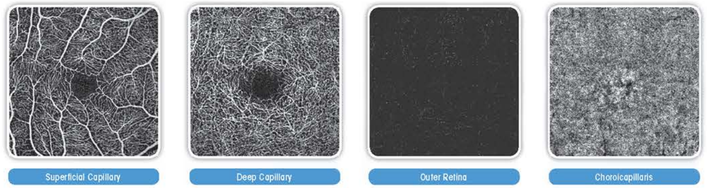
AngioVue images and displays different layers within the retina without requiring a contrast dye injection, unlike fluorescein angiography (FA). In only a few seconds, Oct-angiography with AngioVue allows visualization and assessment of microvasculature within the retina in automatically segmented layers of interest.

AngioVue OCTA scanning can be repeated safely as often as needed to provide the clinical information desired, without the obscuring effects of pooling and staining common in FA or other contrast imaging modalities.




**AngioVue** provides OCTA scan pattern sizes of 3mm x 3mm, 6mm x 6mm and 8mm x 8mm for central macula imaging, and 3mm x 3mm or 4.5mm x 4.5mm for optic nerve area imaging and enface assessment.

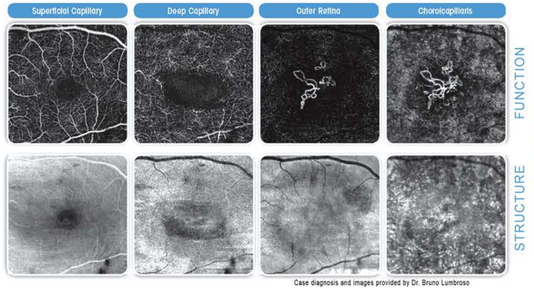
## VISUALIZE PRESENCE OF MICROVASCULAR FLOW WITHIN VIRTUAL DISSECTED LAYERS




Segmentation is automatically generated, to isolate the layers of interest and present enface.



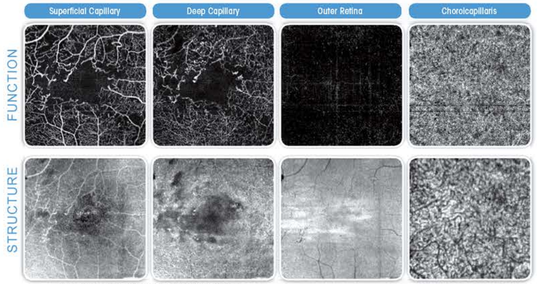
# Clinical



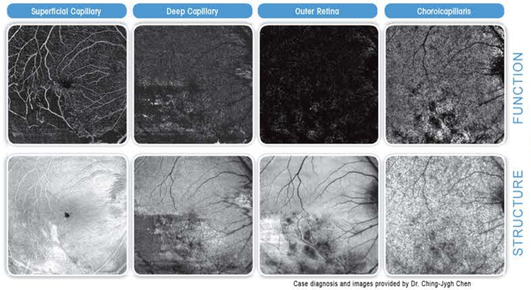

ANGIOVUE IMAGES DEPICTING CHOROIDAL NEOVASCULARIZATION

Case diagnosis and images provided by Dr. Bruno Lumbroso

ANGIOVUE IMAGES DEPICTING DIABETIC RETINOPATHY




Case diagnosis and images provided by Dr. Ching-Jygh Chen

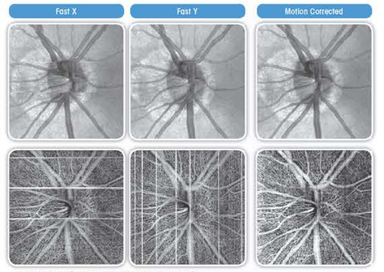



ANGIOVUE IMAGES DEPICTING RETINAL VEIN OCCLUSION

Case diagnosis and images provided by Dr. Ching-Jygh Chen



# Technology



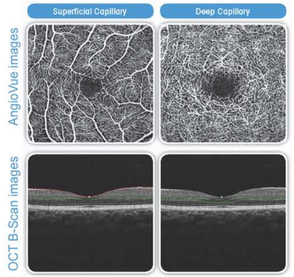

*Motion Correction Technology was originally developed at MIT

## MOTION CORRECTION TECHNOLOGY (MCT*)

- MCT is used to remove motion artifacts such as saccades
- Working closely with MIT, Optovue developed significant improvements in MCT - available only in the AngioVue Imaging system

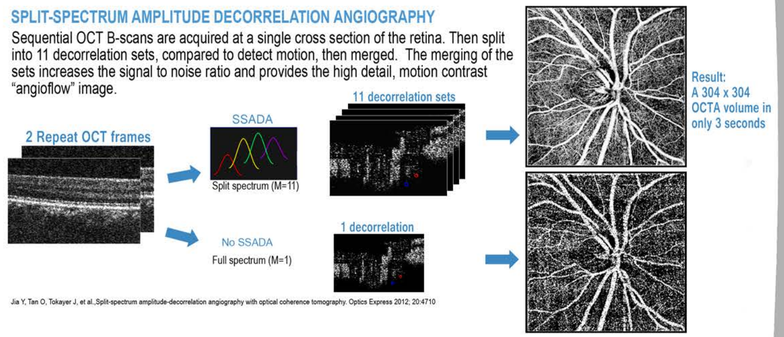
## EN FACE 3D VISUALIZATION

- Enables visualization of the anatomical aspects of the vessels, including the superficial capillary, deep capillary, outer retina, and choroidal capillary.
- The AngioVue data set is 3-dimensional and depth resolved
- Enface viewing of the 3D data allows for selected layers of the retina to be assessed for small changes in structure and function




## SPLIT-SPECTRUM AMPLITUDE DECORRELATION ANGIOGRAPHY

Sequential OCT B-scans are acquired at a single cross section of the retina. Then split into 11 decorrelation sets, compared to detect motion, then merged. The merging of the sets increases the signal to noise ratio and provides the high detail, motion contrast "angioflow" image.




Jia Y, Tan O, Tokayer J, et al.,Split-spectrum amplitude-decorrelation angiography with optical coherence tomography. Optics Express 2012; 20:4710

# AVANTI™ RTVUE XR

optovue
DEFINING THE OCT REVOLUTION

**SPECIFICATIONS**

OCT Camera : **70,000 A-SCAN/SECOND**
Optical Resolution: (in tissue)
- Axial Resolution: 5µm
- Transverse: 15µm

Image Sampling Rate:
- Axial Resolution: 3µm Digital

Scan Range:
- A-Scan Depth: ~3mm
- Transverse: 2mm to 12mm

Scan Beam Wavelength:
- λ=840nm

Exposure Power at pupil: 750µW maximum
Patient Interface:
- Working Distance: 22mm
- Motorized Focus Range: -15D to +20D

Computer:
- CPU: i7, 3.2 GHz, Windows 7® 64 bit
- RAM: 16 GB
- Hard Disk: 2 TB
- Back-up Hard Disk: 2 TB


## Widefield Enface OCT

## Optovue Innovations

Cataract Surgeon ► Total Cornea Power (TCP®)
corneal Epithelium Thickness Mapping (ETM™)*
Glaucoma Specialist ► The Original Ganglion Cell Complex (GCC®) Analysis
Retina Specialist ► Widefield Enface Analysis

P/N 300-49576 Rev B

optovue
DEFINING THE OCT REVOLUTION

Optovue, Incorporated | 2800 Bayview drive, Fremont, CA 94538 USA | PH: +1 510.623.8868 | FX: +1 510.623.8668

*Pending FDA Clearance

For documentation and monitoring of ocular disease

## Optovue Technology and "Firsts" in OCT

The founders and development team of Optovue have been developing devices based on OCT technology since 1993. Four OCT Time-Domain based systems and two Spectral (Fourier)-Domain systems later, we launched the Avanti (XR Avanti) SD-OCT platform in 2013.

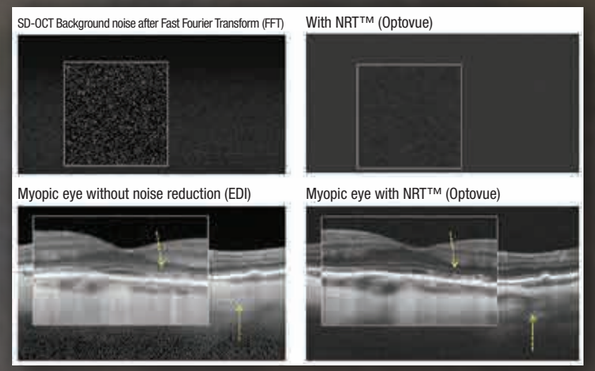
The Avanti embodies many of the "Firsts" in SD-OCT development that Optovue has introduced to eye care, including the first FDA Cleared SD-OCT, 2-phase Noise Reduction, Mode switching to image the inner retina or the deep choroid, Choroid imaging and measurement, Anterior Segment imaging and measurement, GCC with FLV and GLV, Enface Analysis of 3D data, Pachymetry Mapping, Total Cornea Power measurement and more (See "18 TRUTHS" book).

The Avanti SD-OCT allows eye care practitioners at all levels to offer the most current technology, and stay ahead of clinical challenges with confidence. The forward thinking development encompassed in the Avanti also provides clinicians with the basis to move to the next level in clinical OCT utility... functional OCT.

### **Avanti:** The New Standard in OCT Imaging

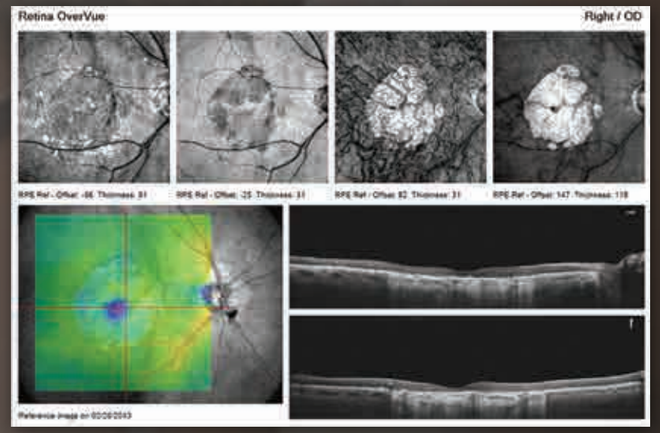
- 70,000 A-scans/second
- Widefield 3D OCT Imaging (12mm x 9mm)
- 320x320 3D cube
- 28µm B-scan spacing
- SMART™ motion correction processing
- 3mm scanning window depth
- Enhanced HD Vitreous & Choroidal imaging
- SharpVue™ processing
- V$^{TRAC}$ Real-time tracking
- Deep Choroidal Imaging (DCI)
- Fovea Location Recognition (FLR)
- TREND analysis for Nerve Fiber & Central Macula
- Pachymetry map of cornea (6mm)
- Total Cornea Power (TCP)
- Epithelium Thickness Map* (ETM™) of cornea (6mm)

*ETM™ (Epithelium Thickness map is pending FDA 510(k) Clearance.

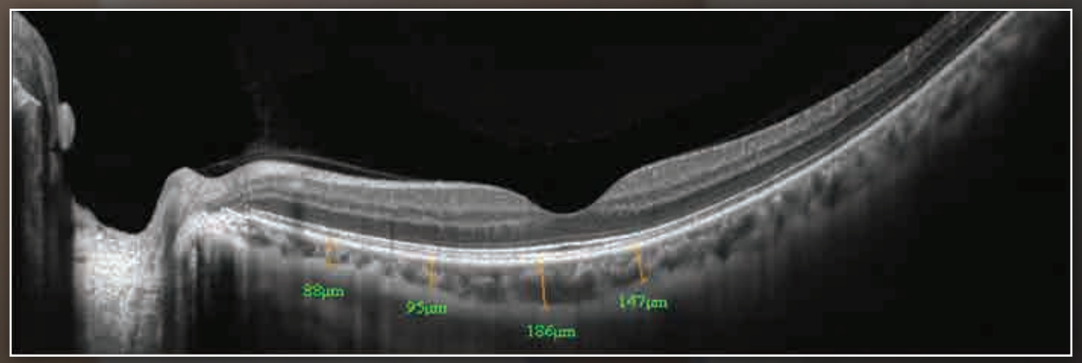



**2-Phase Noise Reduction** available since 2006 in the RTVue FD-OCT system, reduces signal noise both during the scan acquisition and post processing of the data captured. This allows for higher contrast in both the choroid and vitreous for optimum visualization of structures.

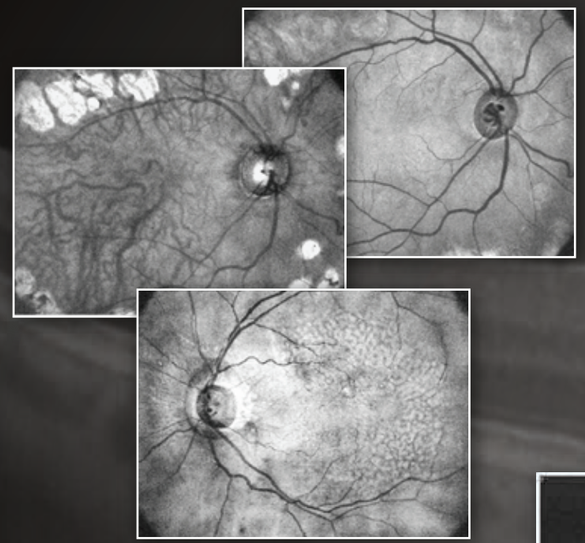
**Motion Correction Technology** applies proprietary algorithms to 3D data, to reduce or remove artifacts caused by eye motion during scanning. 3D scans in OCT systems are the most time consuming and so the most prone to motion artifacts. SMART™ MCT in Avanti allows a 3D cube of 320x320 (104 million data points) over a 12mm x 9mm area of the retina with little or no motion artifacts in most patients.




**SharpVue** technology provides high detailed B-scans up to 12mm using Avanti's 70,000 scans per second, exclusive 2-Phase Noise Reduction, V$^{TRAC}$ real-time Tracking, 5µm tissue resolution (3 digital*) and DCI (Deep Choroidal Imaging).

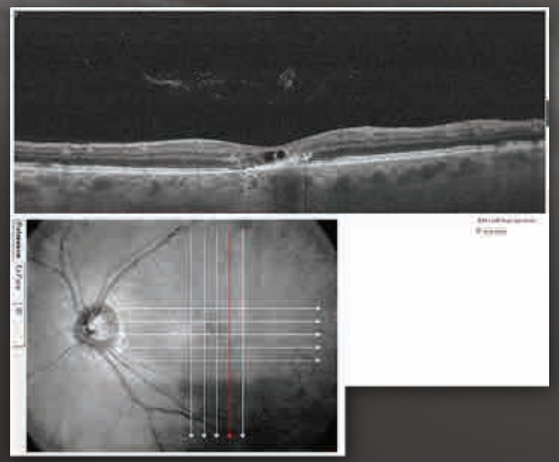


For documentation and monitoring of ocular disease

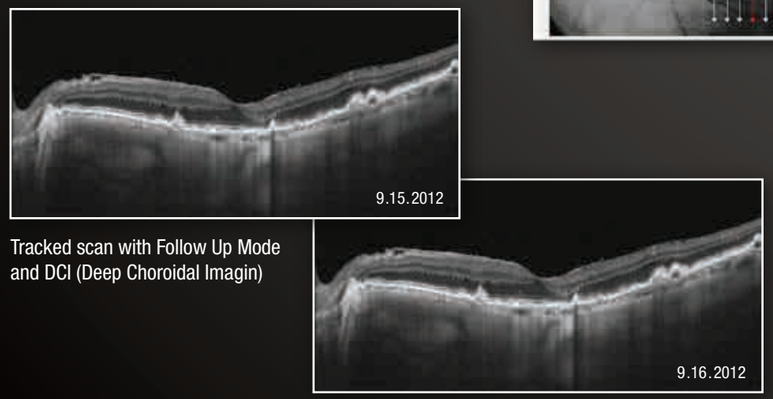


**Widefield 3D with SMART™** Motion Correction Technology processing reduces the incidence of motion artifacts common in a volume scanning. Correct alignment of data improves the likelihood of accurate and repeatable analysis.

**Enface** viewing of 3D data allows for thin slices of the retina to be assessed for small micro-structural changes.



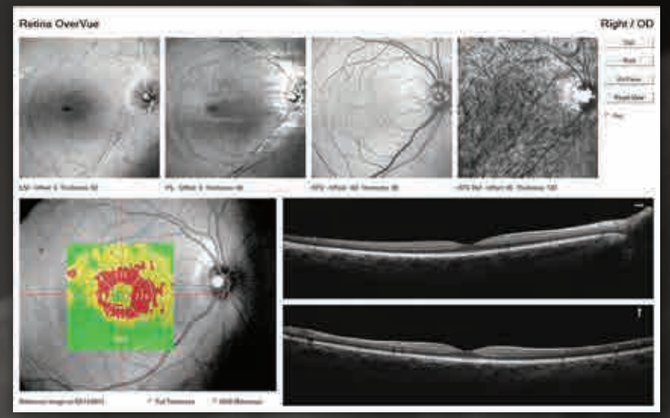
**Widefield Enface Reference**
A specifically segmented enface view of the 320x320 (28 micron spacing) OCT fundus image, provides the high detailed fundus enface reference view for all scan types for orientation and physiological correlation.



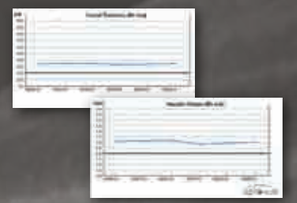

Tracked scan with Follow Up Mode and DCI (Deep Choroidal Imagin)

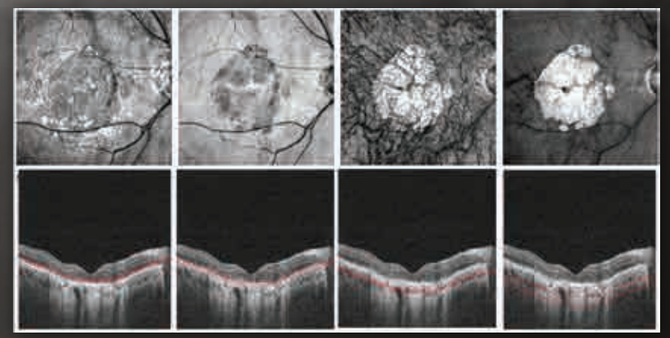
**Real-Time Tracking**
Avanti's V[TRAC] active eye-tracking provides the detail and clarity you need to assess the retina, monitor your patients and track disease progression.

**Retina OverVue Report**
This summary report brings the NDB linked Retina Map, Widefield reference scan and high resolution cross line scan in one, easy-to-read report.

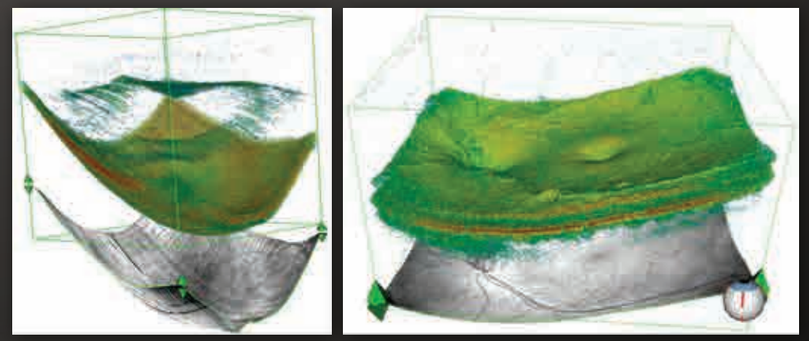



**Retina Trend Analysis**
The new Retina Map Change Analysis report provides a Trend analysis of both the Foveal Thickness and Macula Volume over the course of the patient visit history.

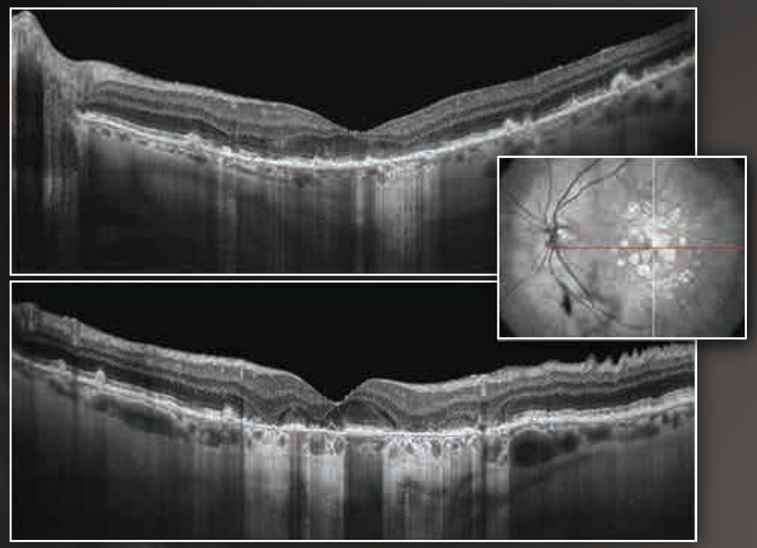




**Multi-layered Enface Report**
Presents a user defined sampling of segmented slices, in high contrast 2D enface summed images. User selectable default for assessment of retina surface neuro-sensory, retina pigment epithelium and choroid.

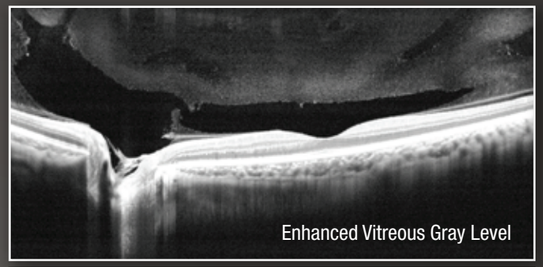


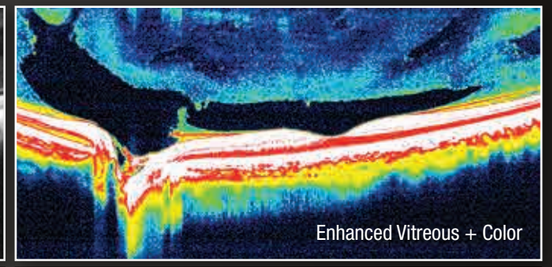
**3mm scan depth** in a 12mm x 9mm volume scan provides visualization of structures from deep choroid well into the vitreous. An asset when documenting long axial length or high myopic eyes.

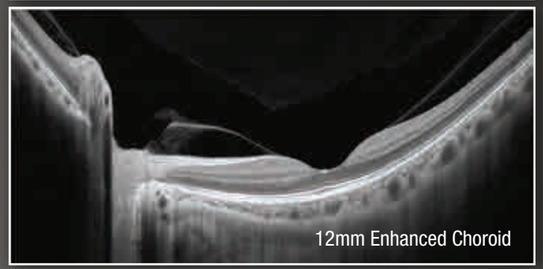


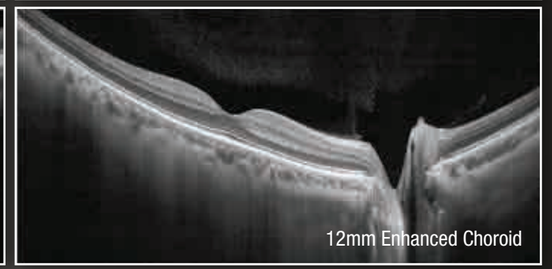
Drusen & Geographic Atrophy

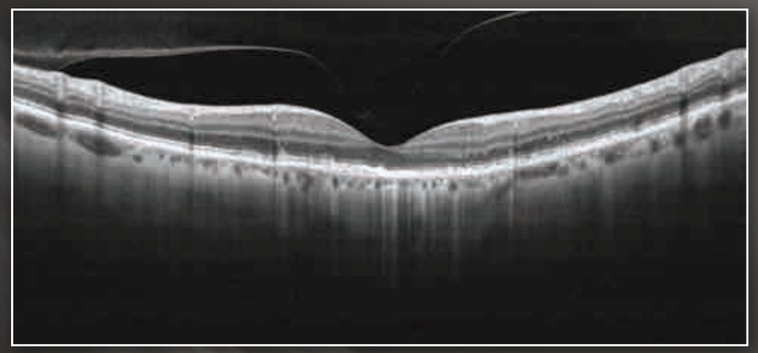
**Enhanced HD** Line Scan provides a high density 12mm scan and presentation option for enhanced vitreous or choroid viewing.



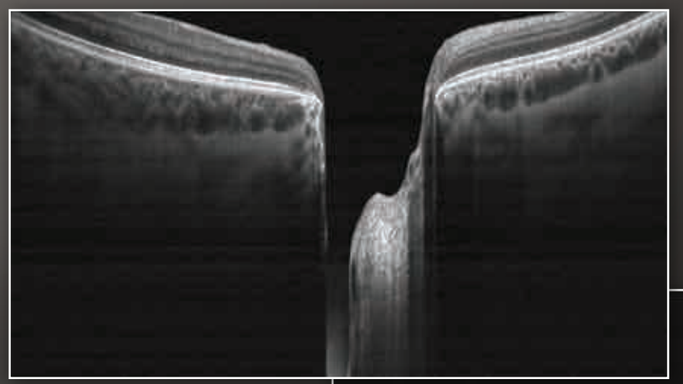



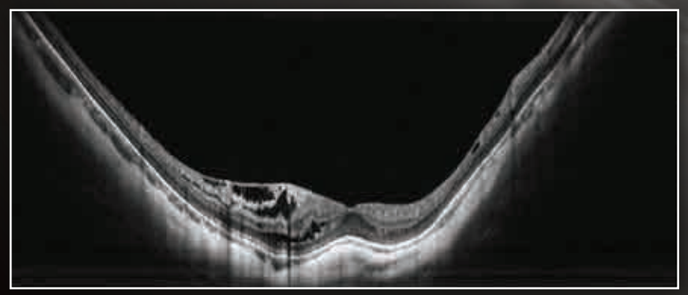



Drusen with VMT



3mm Scan Depth



High Myopia

DCI (Deep Choroid Imaging)

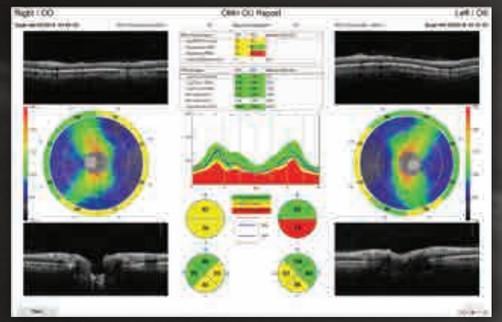
*All images used by permission of authors.

# GLAUCOMA

# **Avanti:** The New Standard In OCT Imaging

## For documentation and monitoring of ocular disease

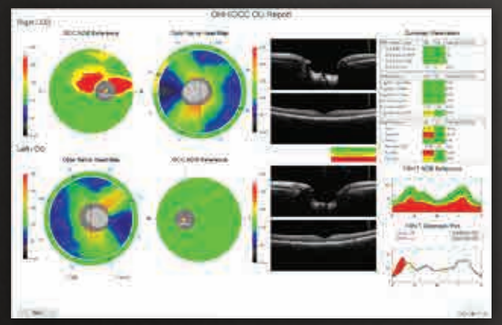
Comprehensive analysis tools for the assessment of changes over time in retinal nerve fiber, optic disc parameters and ganglion cell complex structures.



### Retinal Nerve Fiber (RNFL) and Optic Disc

Optovue's robust proprietary algorithms allows confident assessment of the optic nerve head and Retinal Nerve Fiber. Comparison to a large normative database is provided for the RNFL sampling and optic disc parameters.

**Normative Database (NDB)** comparison reference provided for **Retinal Nerve Fiber Layer**, **Optic Disc** and **GCC** (Ganglion Cell Complex), including **FLV** (Focal Loss Volume) and **GLV** (Global Loss Volume).

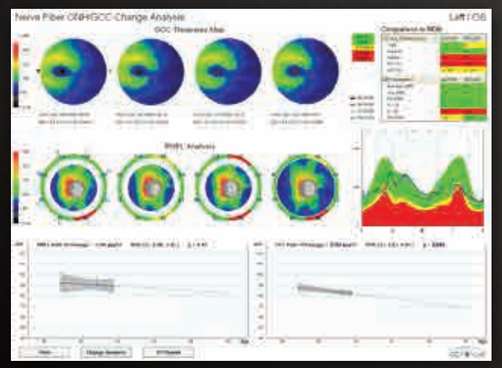


### Ganglion Cell Complex (GCC)

GCC Analysis was introduced to eye care by Optovue in 2007. Seven years of clinical studies have shown Optovue to be the leader in developing and expanding the clinical utility of OCT technology.

### Focal Loss Volume (FLV) & Global Loss Volume (GLV)

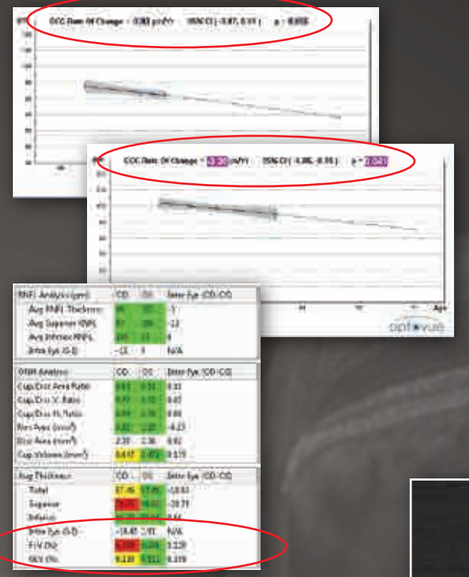
are exclusive and proprietary analysis that increase the specificity and sensitivity of the GCC analysis.



### Combined RNFL / GCC Change Report + TREND

The nerve fiber change summary report with the new TREND analysis provides the most comprehensive presentation of data to simplify your evaluation process.

Proprietary algorithms determine the optic disc margin and vessel patterns to ensure reliable RNFL and optic disc change over time assessment.



### TREND Analysis

providing assessment of rate of change for Retinal Nerve Fiber and Ganglion Cell Complex structure.

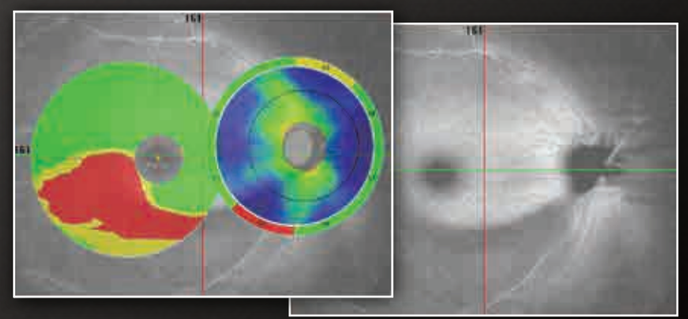
- No highlighting of p-value indicates that there is no statistically significant change over time.
- **Light purple** with black numbers indicates that the change over time is borderline statistically significant.
- **Dark purple** with white numbers indicates that change over time is statistically significant.

### NDB Comparison

summary table provides a quick reference to metrics flagged as borderline or outside normal limits.

### Optic Disc Structure Analysis

High detail structural examination of the optic disc with Cross line B-scans



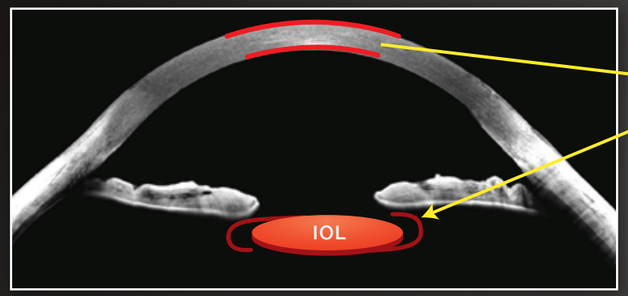
### Widefield Enface Mapping

Convenient and quicker assessment of orientation with RNFL and GCC results mapped to widefield enface.

*Individual result mapping only currently available

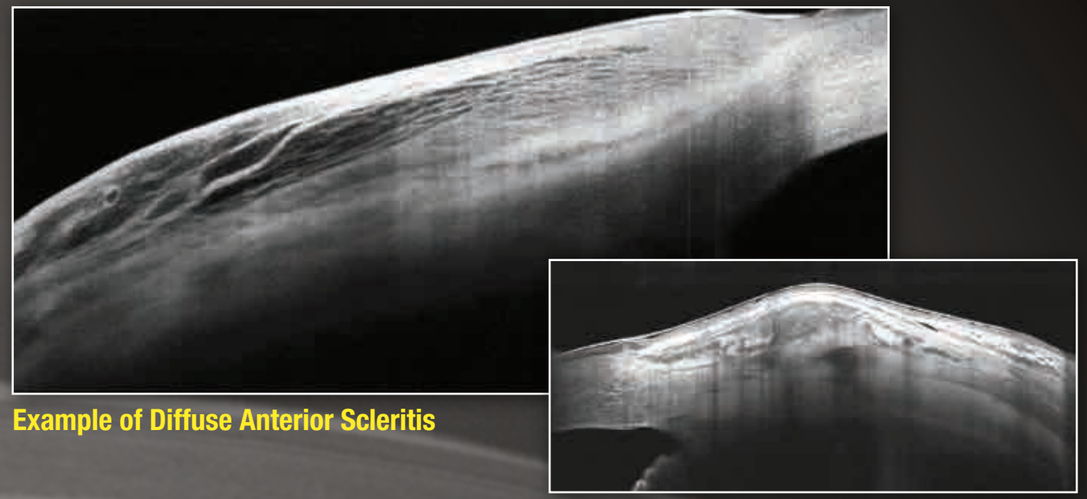
For documentation and monitoring of ocular disease

## TCP®: Total Cornea Power



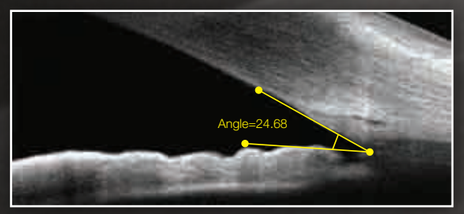

TCP®: Total Cornea Power enhances post-refractive IOL calculations for greater confidence in surgical outcomes.

The Cornea Power Upgrade allows evaluation of patients with prior refractive procedures. Standard topography only calculates the front curvature and then extrapolates posterior curvature. Using the Cornea Power Upgrade option, both the anterior and posterior curvatures are measured directly to obtain cornea powers.

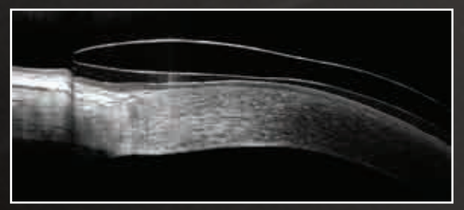


Example of Diffuse Anterior Scleritis

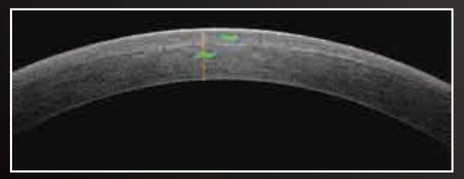
## Cornea B-scans




Angle Visualization and Measurement



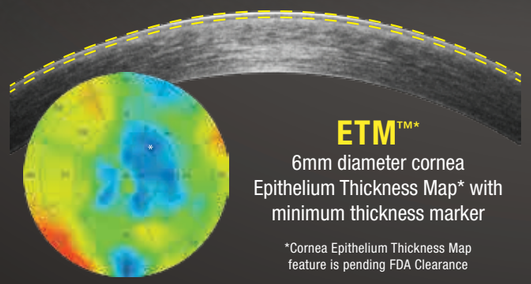
Contact Lens Imaging



**8mm Cornea** B-scan with post refractive measurement

## Pachymetry

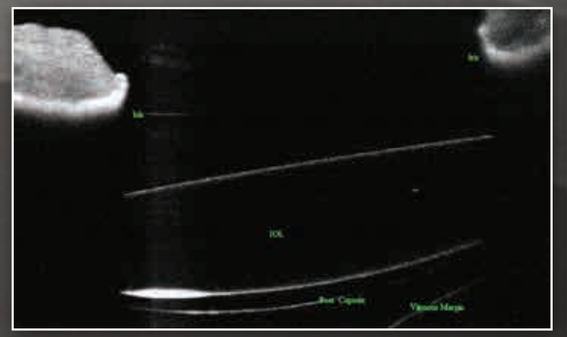

**Pachymetry** - Full 6mm diameter corneal thickness mapping with minimum thickness indicator



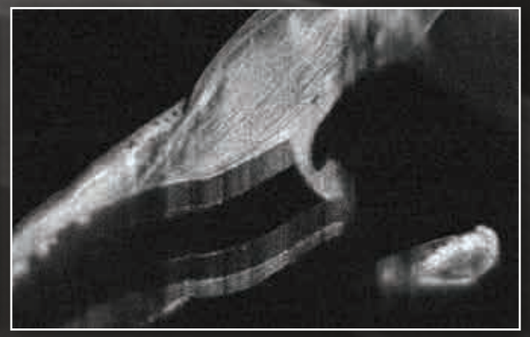
**ETM™***

6mm diameter cornea Epithelium Thickness Map* with minimum thickness marker

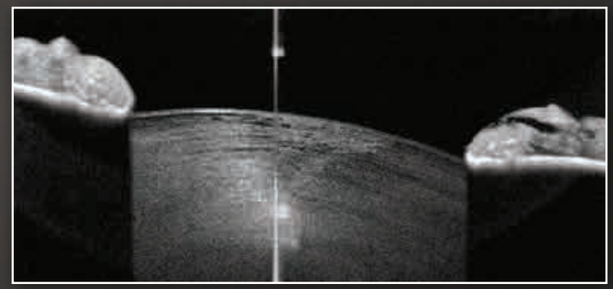
*Cornea Epithelium Thickness Map feature is pending FDA Clearance



IOL Implant



Tube Shunt



Crystalline Lens

Cornea Transplant

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# iScan™ OCT

## Simplicity in Operation

Elevating eye health care
with the **touch of a button.**

optovue

# Introducing iScan™

## OCT Made Easy

1. Enter the patient's information
2. Properly position the patient
3. Touch to start


## iScan vocally guides the patient through the entire exam.*

*Operator can assist by using the touchscreen controls or assume full control in a non-compliant patient.

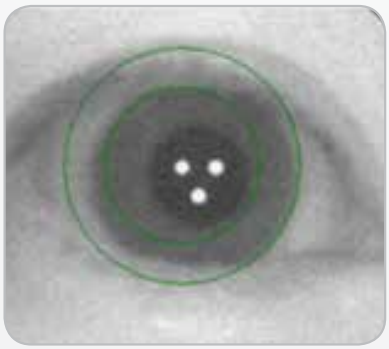
# Why iScan?

## Software-Assisted Platform

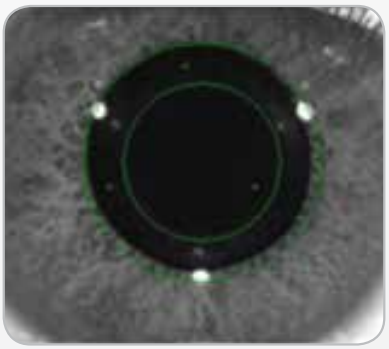
iScan's innovative software-assisted platform makes it ideal for practices with limited staff resources. Operating iScan is simple, requires minimal training and delivers consistent scan acquisition.

- Detects the eye to be scanned
- Aligns the camera over the pupil
- Optimizes the scan signal strength

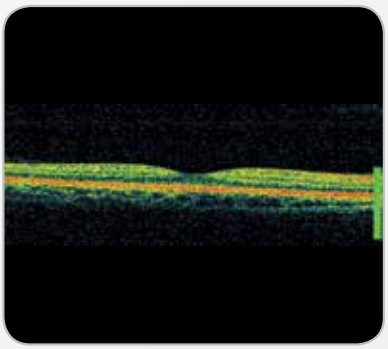
After completing scan acquisition, iScan evaluates each scan to ensure quality data has been captured.



**Eye Detection**



**Camera Alignment**



**Signal Strength Optimization**


## Truly Portable

iScan weighs in at only 43 pounds, making it easy to move the instrument from room to room or practice to practice. Setting up the system is as easy plugging in the power cord and unlocking the system.

## Compact Design

iScan's space-saving footprint makes it ideal for small spaces and the tabletop design offers the flexibility to place it in any room in the practice.

***Retinal thickness map*** *uncovers thinning and thickening*

***GCC map*** *uncovers GCC thinning*


***FLV & GLV**** *are valuable data points to aid in the prediction of visual field conversion in glaucoma suspects*

# iWellness Scan

## Expanding Eye Health Care…

- Elevate your comprehensive eye exam with detailed information on the health of the retina
- Streamline the exam process by quickly confirming normal or more efficiently diagnosing pathology
- Improve patient education with personalized eye health information presented in one simple report

## New Revenue Stream

- Create a new revenue stream that is not reliant on third-party payers
- Grow the number of medical patients you see with one fast and simple scan
- Differentiate your practice and retain patients by delivering care that protects eye health

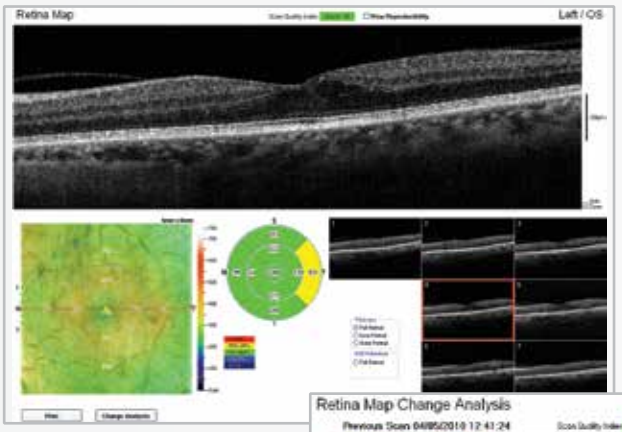
## Quick & Easy

- The iWellness scan takes just moments to complete
- Single report displays retinal thickness and GCC thickness with normative comparison and symmetry analysis

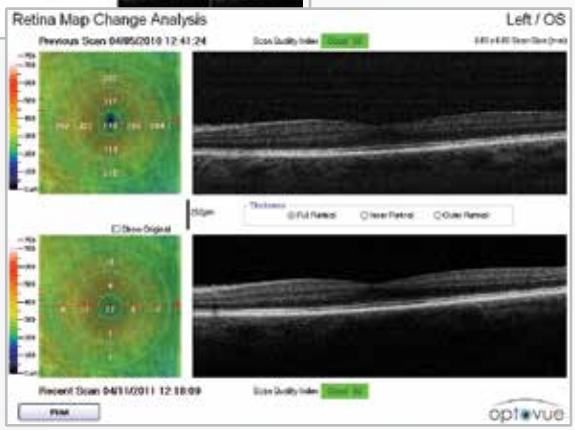
# iScan Essential

## Retina Map

The retina map is an effective diagnostic tool for assessing retinal swelling and thinning as well as evaluating the integrity of the macular area.




*Retina Map*

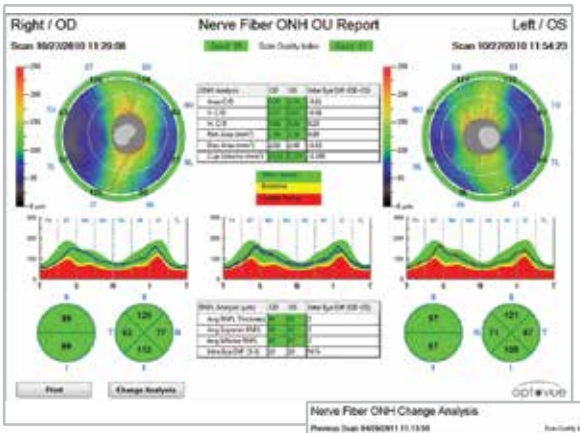



*Retina Map with Change Analysis*

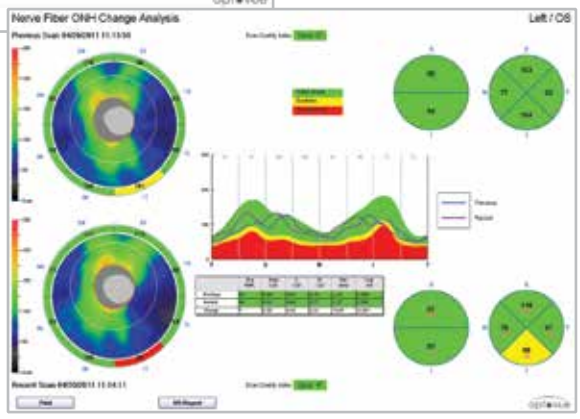
## Optic Nerve Head Scan

The optic nerve head analysis provides a detailed view of the nerve head with a study of the thickness of the retinal nerve fiber and cup/disc parameters.

An OU report allows symmetry analysis.




*RNFL/ONH Report*

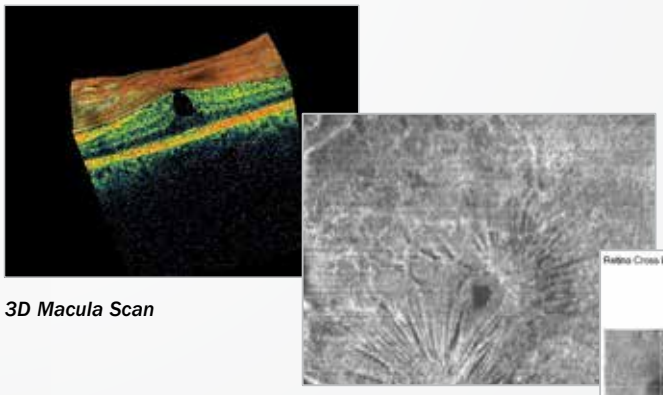



*RNFL/ONH Report with Change Analysis*

# iScan Comprehensive

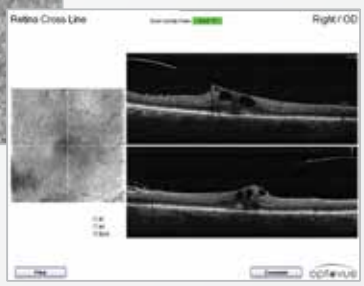
## Retina

- 3D retina scan with en face analysis enables virtual dissection of the retina by displaying three different reference planes: ILM, IPL and RPE.
- HD crossline scan

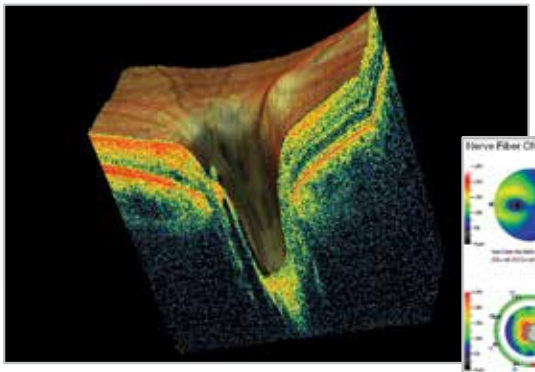


*3D Macula Scan*

*En Face View of Inner Limiting Membrane*



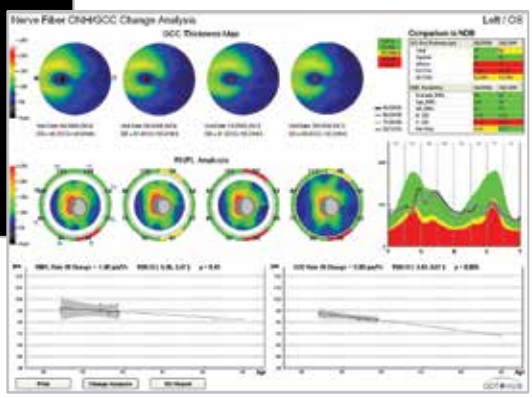

*HD Crossline Scan*



*3D Optic Disc Scan*

## Optic Nerve

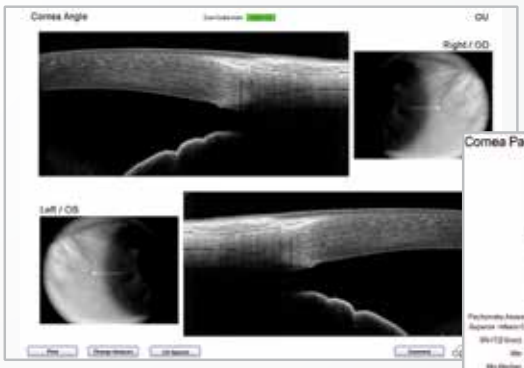
- 3D disc scan shows the optic nerve in cross section and gives a representation of the relative thickness of the selected slices
- GCC analysis aids in identification of ganglion cell loss, which can preceed RNFL loss.



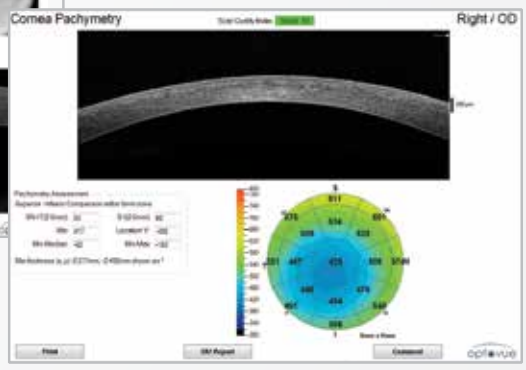

*ONH/GCC Report with Change Analysis*

## Cornea

- Pachymetry
- Angle measurement




*OU Angle Report*




*Pachymetry Map*

## iScan Enhances Your Practice

iScan demonstrates your practice's commitment to eye health by offering your patients the most comprehensive eye health care available with cutting-edge technology. And **iScan** with **iWellness** gives your practice a new revenue stream to grow your bottom line.

# Optovue is committed to your success with OCT

- **All iScan owners receive support from an iWellness Practice Consultant** who provides **one-on-one implementation** support to set your practice on the path to success
- **Exclusive education programs** delivers valuable resources on getting the most from your OCT
- Optovue's Lifelong Customer Care program offers options for protecting your investment and includes five years' unlimited phone support.

*"Patients really like being able to see that everything is normal, or if there is a problem, being able to actually see it and be involved in their own care."*

**Amy Peterson, O.D.**
Saxonburg Family Eye Care

Optovue, Incorporated:
2800 Bayview Drive, Fremont, CA 94538
PH: +1 510.623.8868 | FX: +1 510.623.8668

300-50059 Rev B

# iFusion™

## SD-OCT & Digital Fundus Photography

## The Complete Retinal Imaging Solution

optovue

# iFusion™ THE COMPLETE RETINAL IMAGING SOLUTION

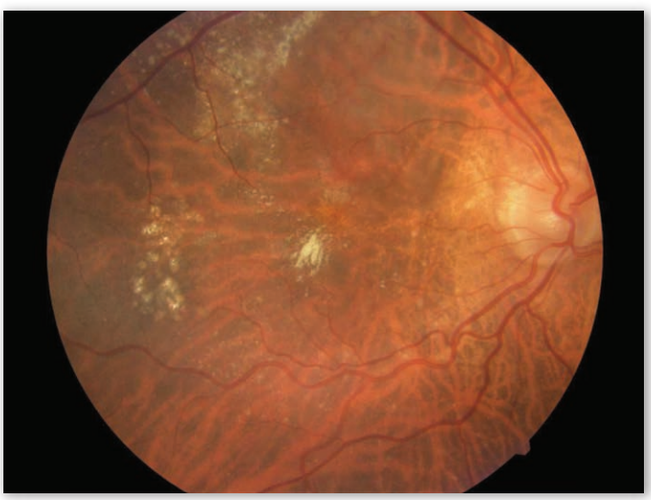
iFusion combines the best of Spectral-Domain OCT and Fundus imaging by adding the powerful OCT capabilities of iVue® and high quality imaging from iCam® on a single, integrated, versatile platform that will add value to your practice.

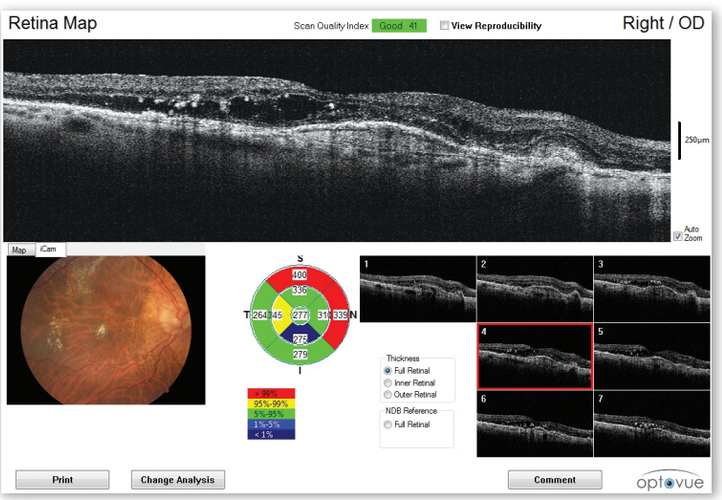
## SAVE TIME & SPACE FOR PRACTICE EFFICIENCY

iFusion enhances your practice efficiency by streamlining your workflow in evaluating the patient with OCT and fundus imaging at one compact instrument.


## UPGRADE OPTIONS FOR MORE FLEXIBILITY

As your technology needs change, iFusion's modularity provides you various upgrade pathways to choose from so that you can offer the latest in OCT and fundus imaging to your patients.






High Quality Imaging | Affordable | Easy Integration

# The Fusing of OCT & Fundus Photography


*For illustrative purposes only

# iFusion™

## SD-OCT & Digital Fundus Photography

### iVue® SD-OCT

**SPECIFICATIONS**

iVue Scanner:
- OCT Image: 26,000 A-scan/second
- Frame Rate: 256 to 1024 A-scan/Frame
- Depth Resolution (in tissue) : 5.0 µm

Scan Range:
- Depth: 2 or 2.3mm
- Transverse: 2mm to 12mm

Scan Beam Wavelength: λ=840±10nm

Exposure Power at pupil: 700µW to 750µW

External Image (Live IR)
- FOV: 13mm x 9mm

Patient Interface:
- Working Distance: 21.2mm for retina, 16.6 for cornea
- Motorized Focus Range: -15D to +10D

### iCam™ Non-Mydriatic Fundus Camera

**SPECIFICATIONS**

Field Angle: 45˚

Image: 5.2 Million Pixels

Pupil Diameter: ≥4mm

Illumination During Alignment to Patient's Eye: NIR LED

Flash for Retina Image Capture:
- White LED located inside the instrument at the end of the illumination optical train, synchronized to flash with the capture function

Cornea Image:
- Illumination from 3 external white LED sources in steady state mode

Total Focus Diopter Adjustment Range: -35D to +30D

Z-ranging (Working Distance): ~25mm

Fixation: 6 Internal & 1 Adjustable External

Focus Adjustment: Manual

### All-In-One Computer

**SPECIFICATIONS**

21.5" Display

Windows 7®

i5 Intel® Processor

4GB Memory

500GB Storage

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Optovue, Incorporated | 2800 Bayview drive, Fremont, CA 94538 USA | PH: +1 510.623.8868 | FX: +1 510.623.8668
Optovue, Europe GmbH | Gerhart-Hauptmann-Str. 38, 69221 Dossenheim, Germany | PH: +49 6221 5860 661 | FX: +49 6221 5860 664

P/N 300-48246 Rev B

AVANTI™ RTVUE XR

# Glaucoma Module

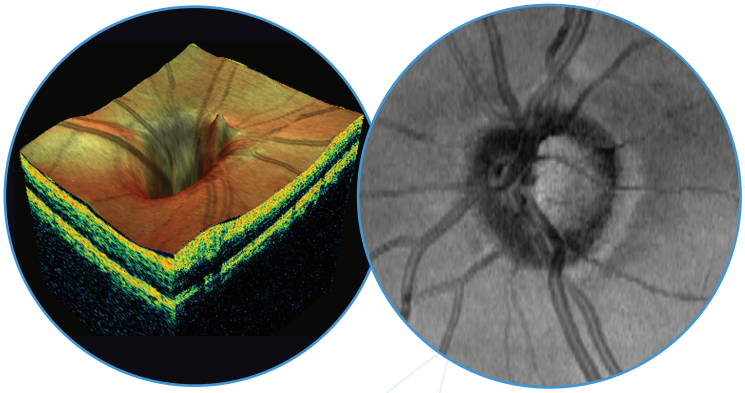
**The Avanti Glaucoma Module** is a comprehensive offering that includes new metrics and advanced methods of monitoring structural change as well as the standard features you've come to expect from posterior segment OCT.

**Avanti Widefield OCT** incorporates RNFL and Ganglion Cell Complex (GCC) measurements with the added parameters of Focal Loss Volume (FLV%) and Global Loss Volume (GLV%) that increase the sensitivity and specificity of the GCC analysis.[1] The RNFL and GCC trend analysis report provides a tool for approximating rate of change that enables personalized treatment protocols and improved patient education.

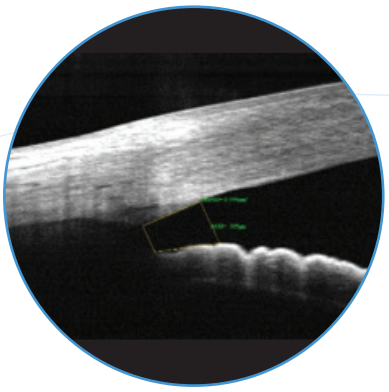
## Visualize

Ocular structures in exquisite detail to aid in glaucoma diagnosis

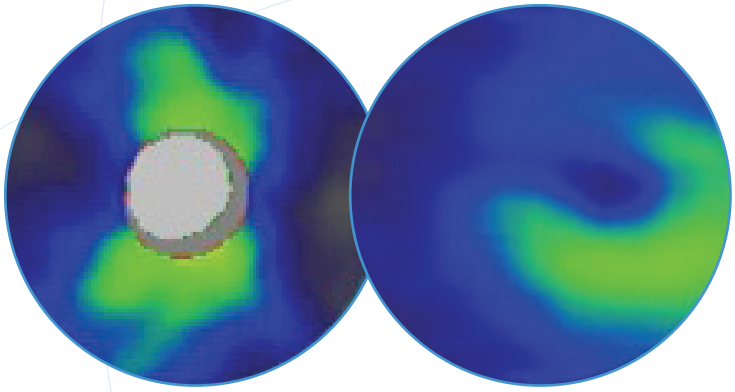
Optic Disc Structures with 3D Disc Scan and En Face Presentation



Anterior Chamber Angles



ONH and GCC Thickness



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# Glaucoma Module

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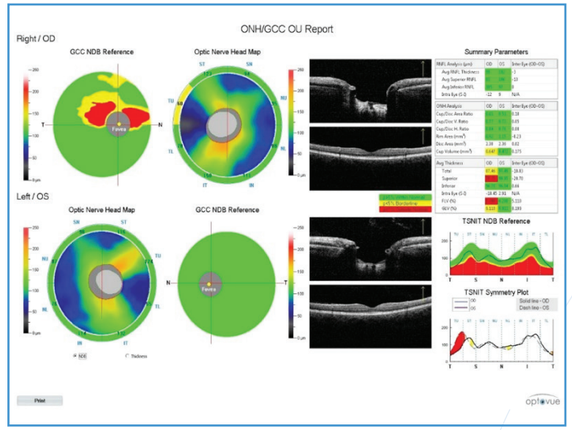
## Analyze

Disease progression with comprehensive report

### Quantify

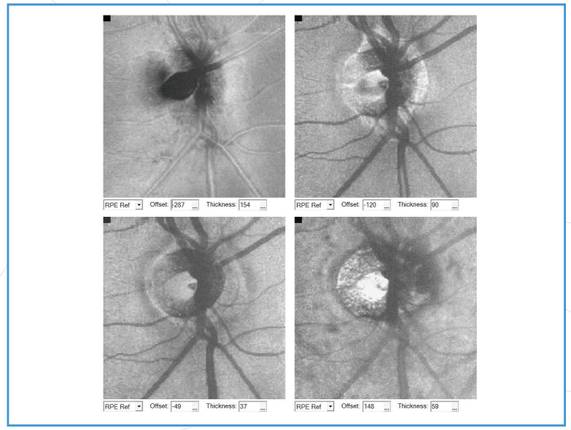
RNFL, optic disc and GCC parameters with normative comparison




ONH and GCC Report

### Evaluate

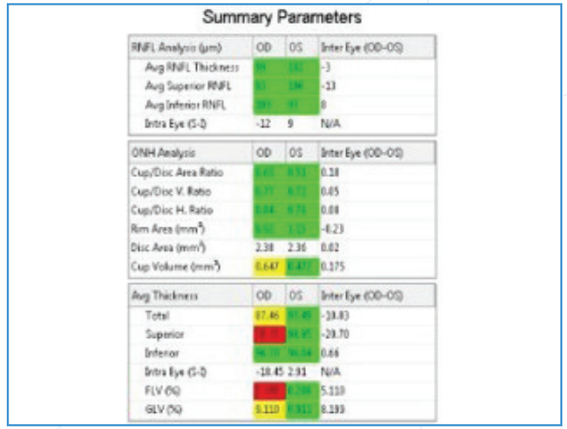
Individual layers of the optic disc with en face presentation




ONH En Face Report

### Analyze

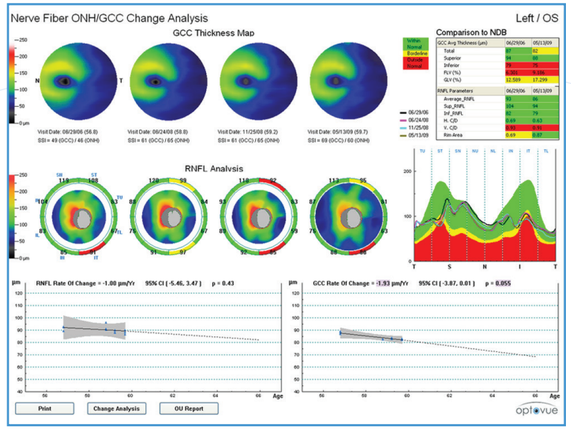
Metrics that increase the sensitivity and specificity of the GCC analysis




Focal Loss Volume (FLV%) and Global Loss Volume (GLV%)

### Approximate

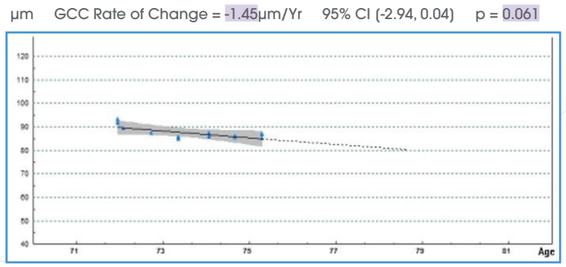
Rate of change for RNFL and GCC structures

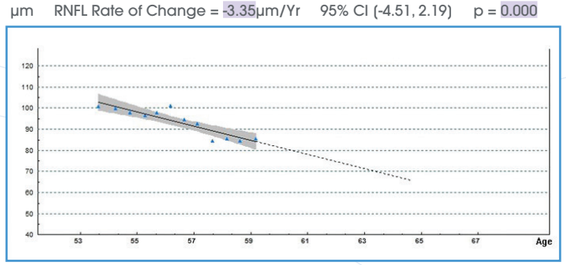



Trend Analysis Report

## Personalize

Treatment protocols with extensive information on disease progression



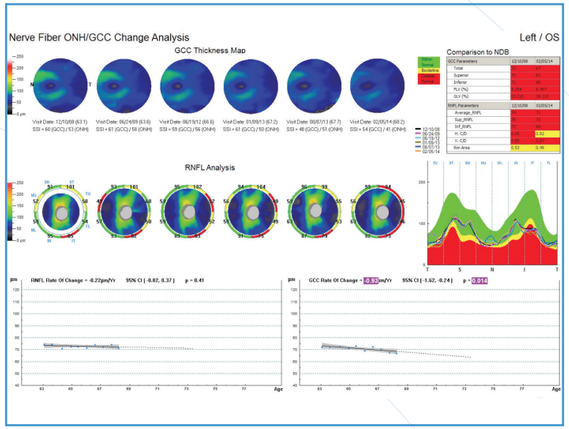




### Patient Care

Differentiate between rapidly progressing eyes and those progressing more slowly with trend analysis of both the RNFL and GCC structures.

Avanti Trend Analysis reports include an estimate of the rate of change, as well as the confidence interval and the statistical significance of the rate of change.

- No highlighting of the p-value indicates no statistically significant change over time.
- Light purple highlighting with black numbers indicates the change over time is borderline statistically significant.
- Dark purple highlighting with white numbers indicates a statistically significant change over time.




### Glaucoma Management

Reviewing with patients the structural changes caused by the disease conveys the importance of treatment compliance.

The Avanti nerve fiber change summary report displays GCC and RNFL thickness maps for up to six patient visits. A comparison table highlights the first and last visit as related to the normative database.

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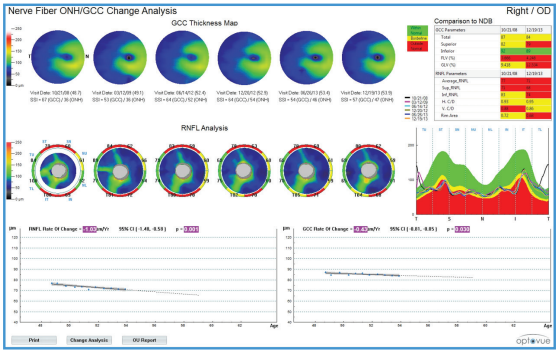
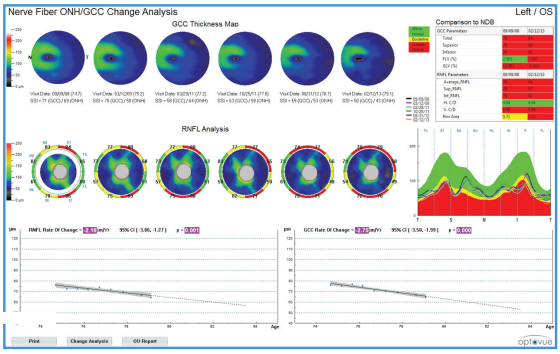
# Case Studies



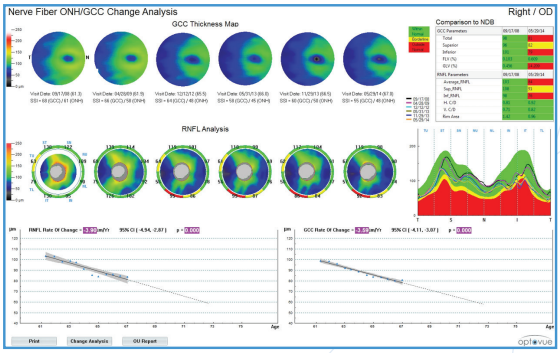

## Case 1: Glaucoma Patient with Slow Rate of Progression

The trend analysis suggests a slow rate of progression of approximately 1 micron per year. Correlation of the rate of change with the patient's age and other unique characteristics enables a personalized treatment protocol.




## Case 2: Glaucoma Patient with Moderate Rate of Progression

The estimated rate of change of 2.2 microns per year (RNFL) and 2.8 microns per year (GCC) indicates a moderate rate of progression. Correlation of the estimated rate of change with the patient's age and other unique characteristics aids in clinical decision making.




## Case 3: Glaucoma Patient with Fast Rate of Progression

This patient has rapidly thinning GCC and RNFL structures as approximated by trend analysis. Historical data indicates that the RNFL is thinning at a rate of 3.9 microns per year, and the GCC is thinning at a rate of 3.6 microns per year. Treatment protocols should address the fast rate of progression.

Case studies and images courtesy of Linda M. Zangwill, PhD, Professor of Ophthalmology, University of California, San Diego

# References

Loewen, N, Zhang, X. Combining measurements from three anatomical areas for glaucoma diagnosis using Fourier-domain optical coherence tomography. Br J Ophthalmol. 2015; 25(0):1-6.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# Retina Module

**The Avanti Retina Module** gives Retina Specialists new information on structures outside the traditional 6mm x 6mm cube, provides assessment of individual layers of the retina, offers views of the vitreous and deep choroid, and enables evaluation of change over time.

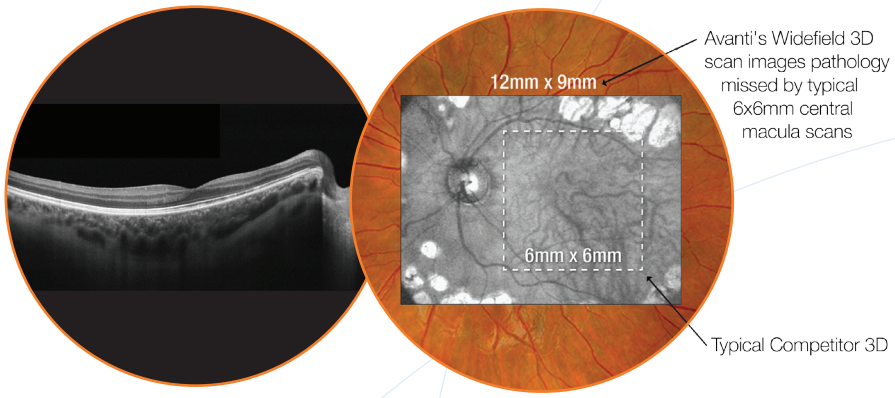
**Avanti Widefield OCT** incorporates a number of technologies that deliver clinical and practical benefits.

- High-speed scanning produces exquisitely detailed 12mm x 9mm images in less than three seconds
- Motion Correction Technology minimizes motion artifact
- Real-time tracking enables assessment of disease progression
- A range of reports allow personalized views of retinal anatomy

## Visualize

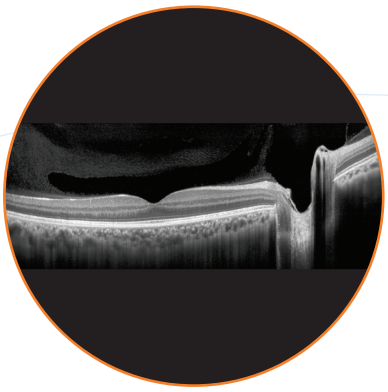
Retinal anatomy beyond the standard 6mm scan from the deep choroid into the vitreous

### Widefield Views of Retinal Anatomy

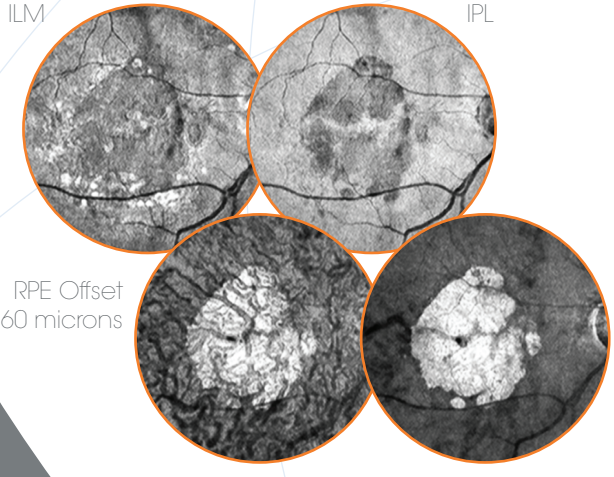



*For illustration purposes only.

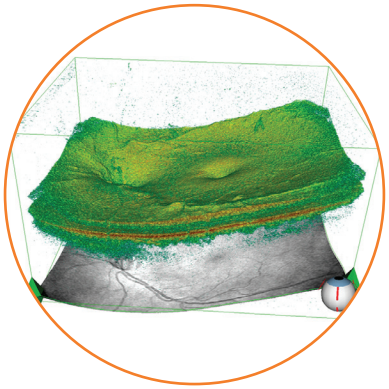
### Deep Choroid and Vitreous Structures



### Individual Layers of the Retina




### 12mm x 9mm 3D Cube with 100 Million Data Points



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# Retina Module

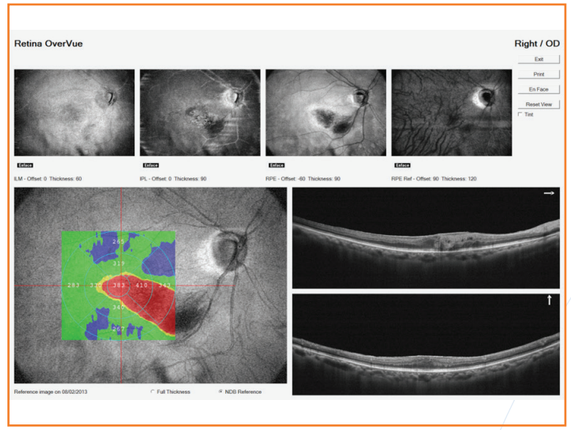
AVANTI™ RTVUE XR

## Analyze

Retinal structures with comprehensive reports

### Assess

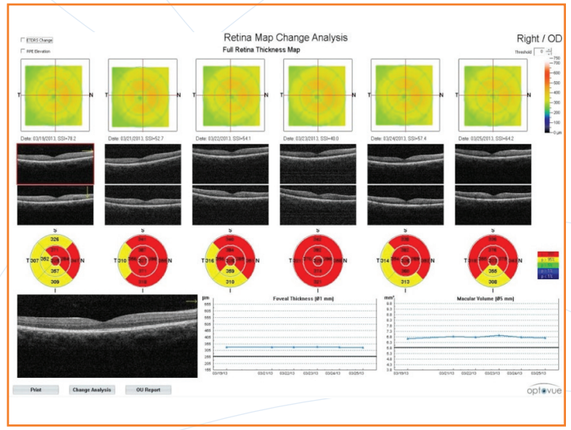
Multiple views of the retina in a single, easy-to-read report




**OverVue Report:** Retinal thickness with NDB comparison, widefield reference scan, high-resolution crossline scan

### Track Change

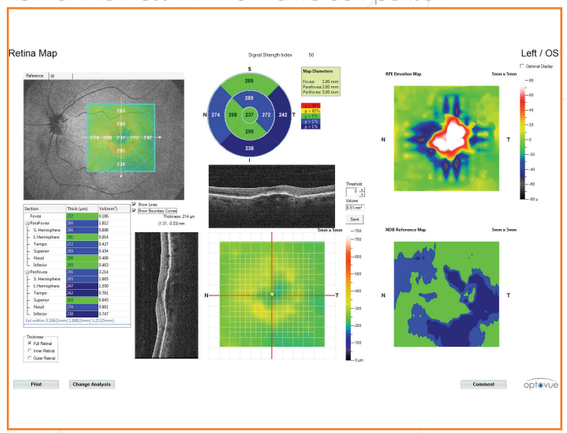
In foveal thickness and macular volume




Change Analysis Report

### Measure

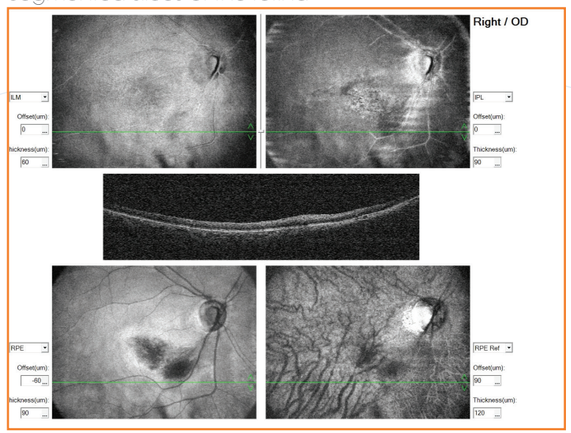
Retinal thickness with normative comparison




Retina Map Report

### Study

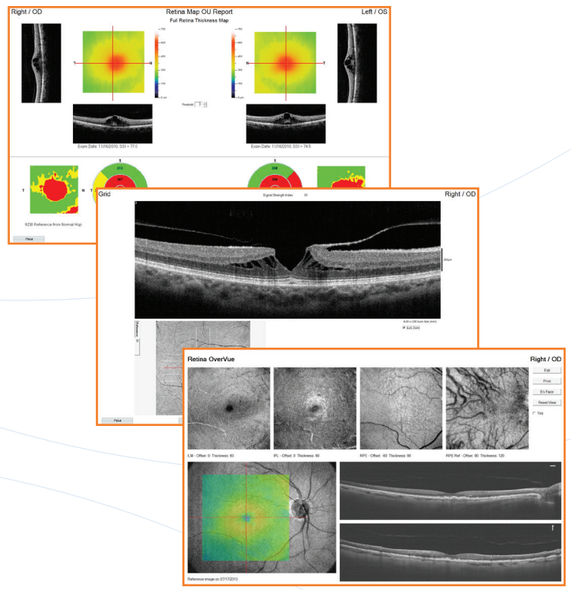
Segmented slices of the retina




Multi-Layered En Face Report

## Personalize

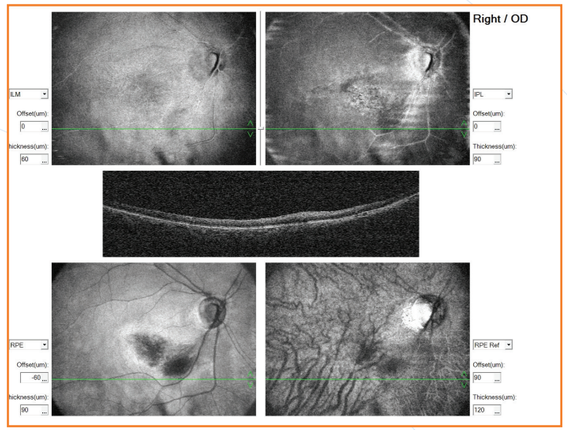
Your view of the retina to optimize treatment planning and patient outcomes




### Retinal Assessment

The Avanti Retina Module offers a range of scans to provide extensive information about retinal health.

- 3D Widefield scan displays 9mm x 12mm views of the retina with minimal artifact.
- Crossline, grid, raster and radial scans offer unique perspectives on retinal structures.
- En face viewing displays individual layers of the retina for assessment of micro-changes.
- 3mm scan depth reveals structures from the deep choroid to the vitreous.




### Patient Care

Tailor your approach to treatment with information provided by the Avanti Retina Module.

- View the peripapillary retina to identify pathology and begin treatment and disease management earlier.
- Increase diagnostic confidence by isolating and studying individual retinal layers.
- See deep into the choroid to optimize treatment protocols for highly myopic eyes.

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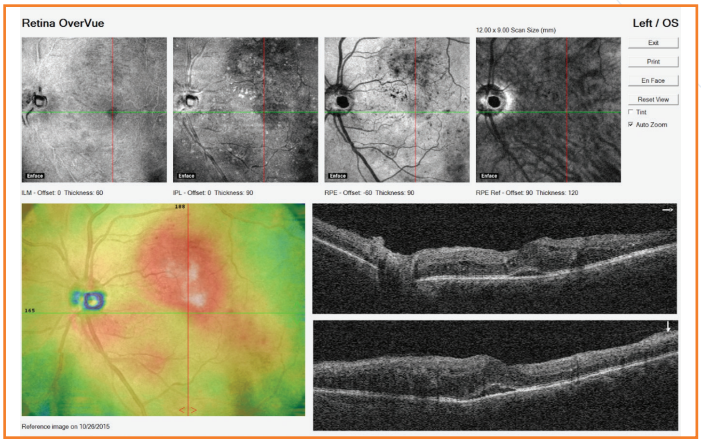
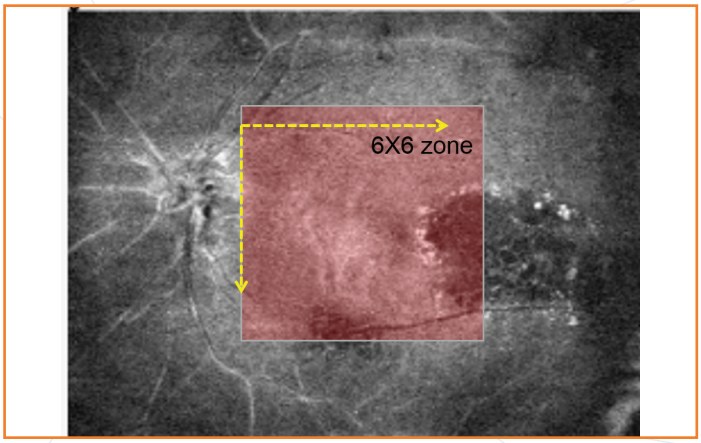
# Case Studies: Diabetic Retinopathy

## Case 1

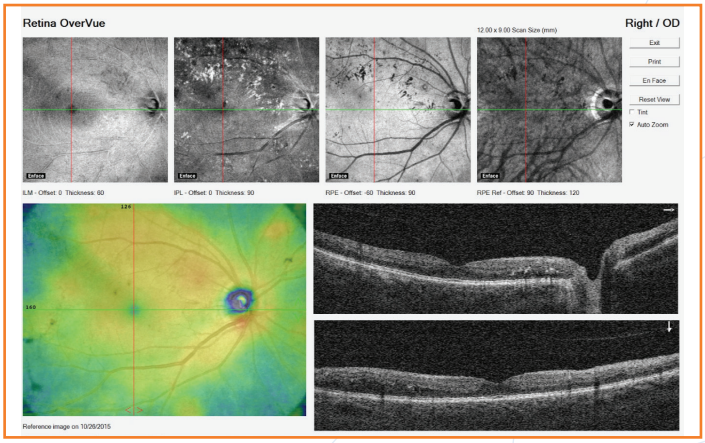


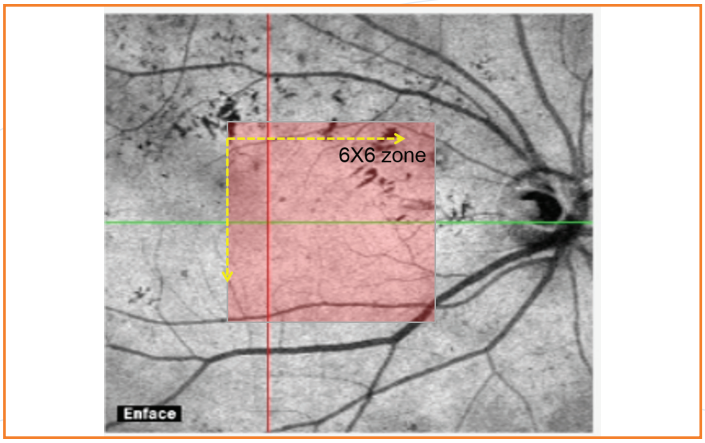




Multi-layered en face analysis of the retinal layers reveals the extent of the pathology in the IPL and RPE.

While some pathology is visible in the central 6mm of the retina, a wider field of view provides additional diagnostic information on the extent of the disease.

## Case 2




En face imaging enhances information provided by the standard b-scan by producing easy-to-interpret images of individual layers of the retina. Assessing each layer separately shows the extent of the tissue affected by the pathology.

In this case of diabetic retinopathy, very little pathology is evident in the central 6mm of the macula.

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