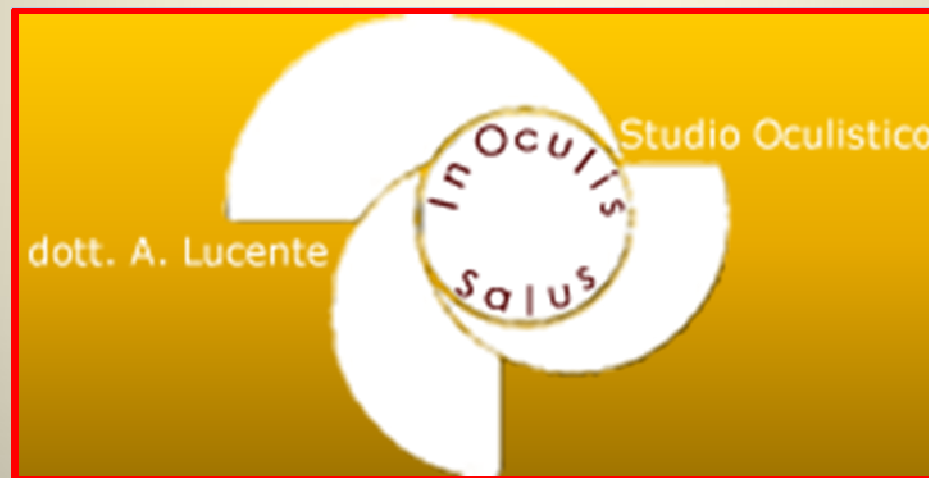


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Corso ZEISS

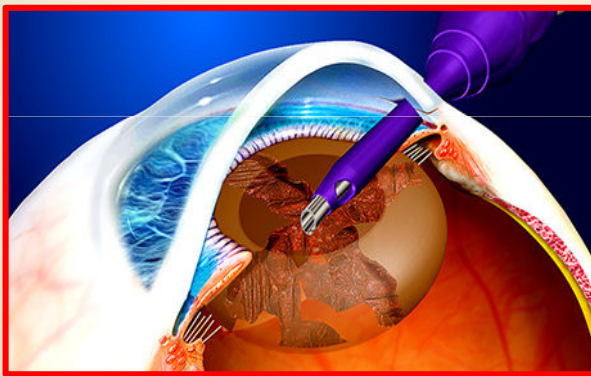
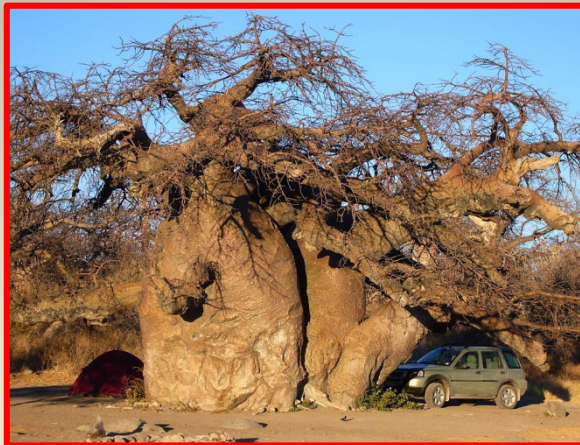
Extensive OCT under standing: retina, miopia, neuroftalmologia, glaucoma

Glaucoma tra struttura e funzione: la risposta degli OCT

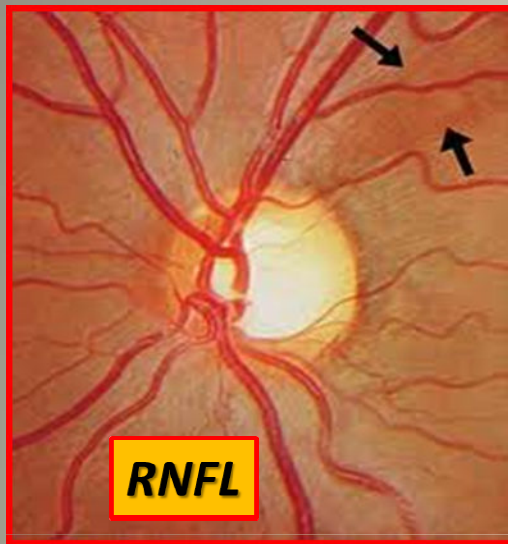


No financial interest

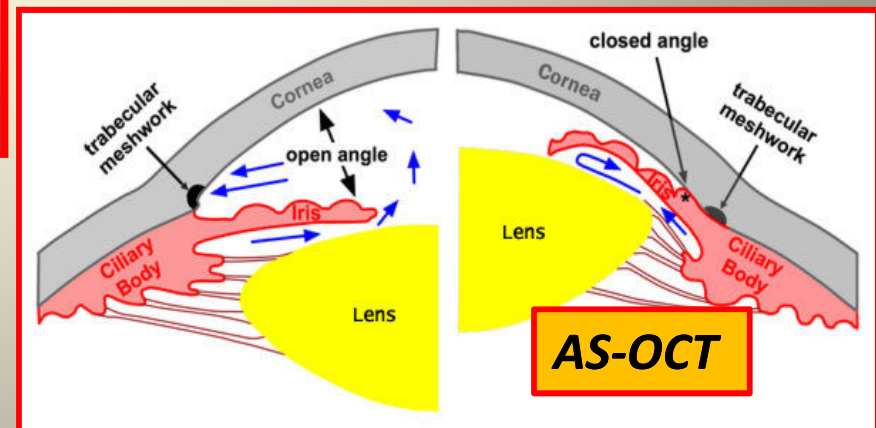
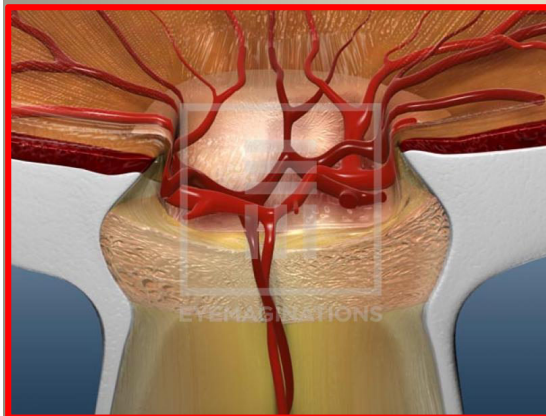
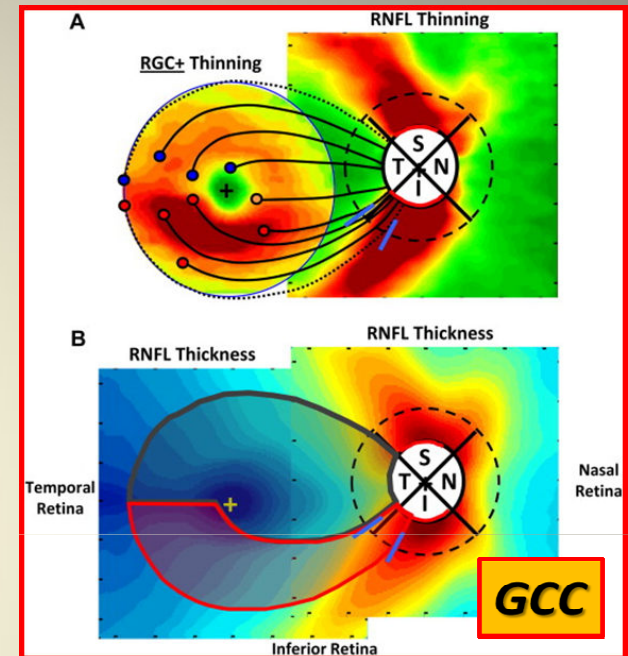
Structure and function: not only glaucoma



HD-OCT & Glaucoma: What?

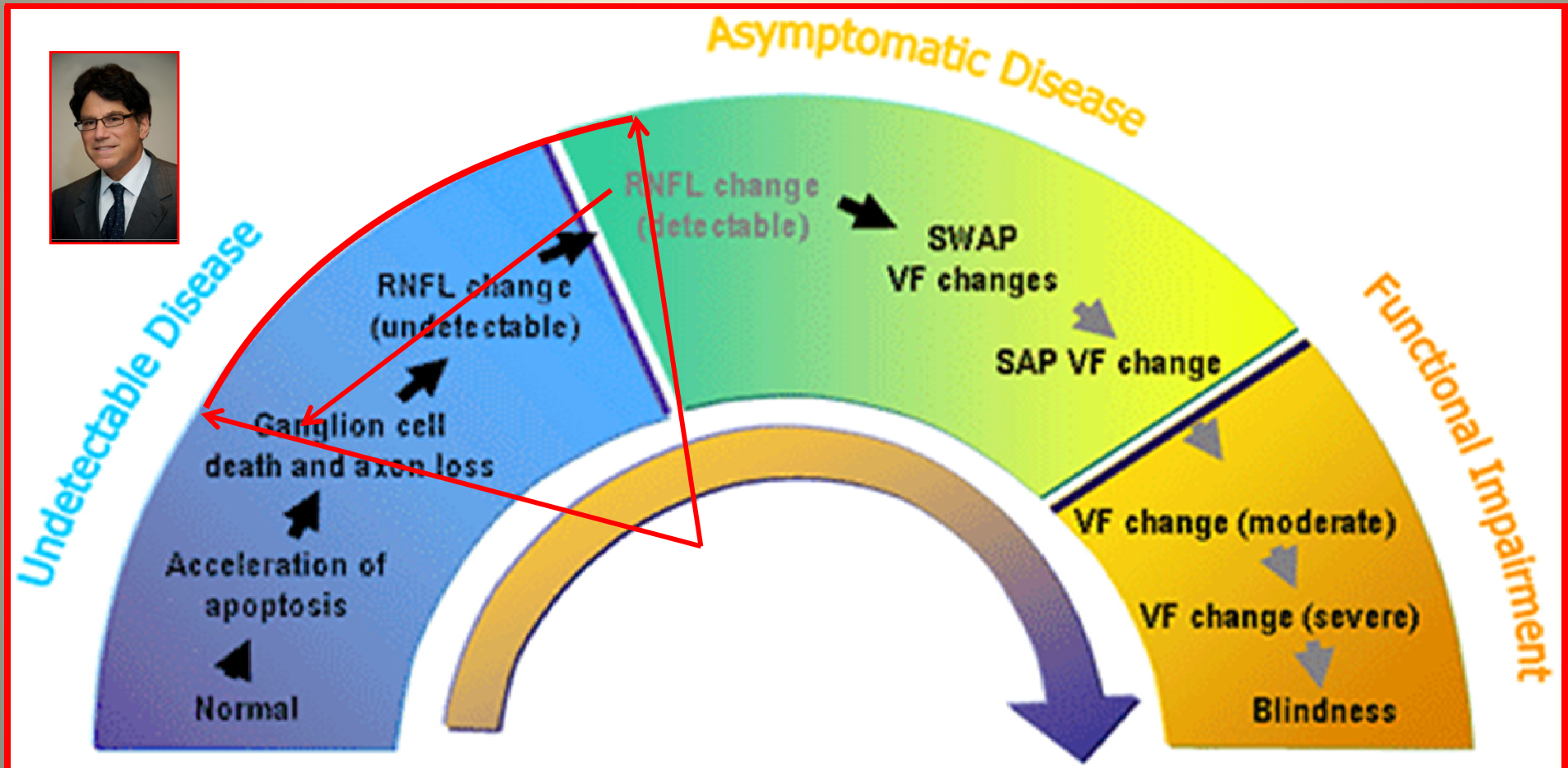


- RNFL
- ONH
- GCC
- AS-OCT
- Combo Report

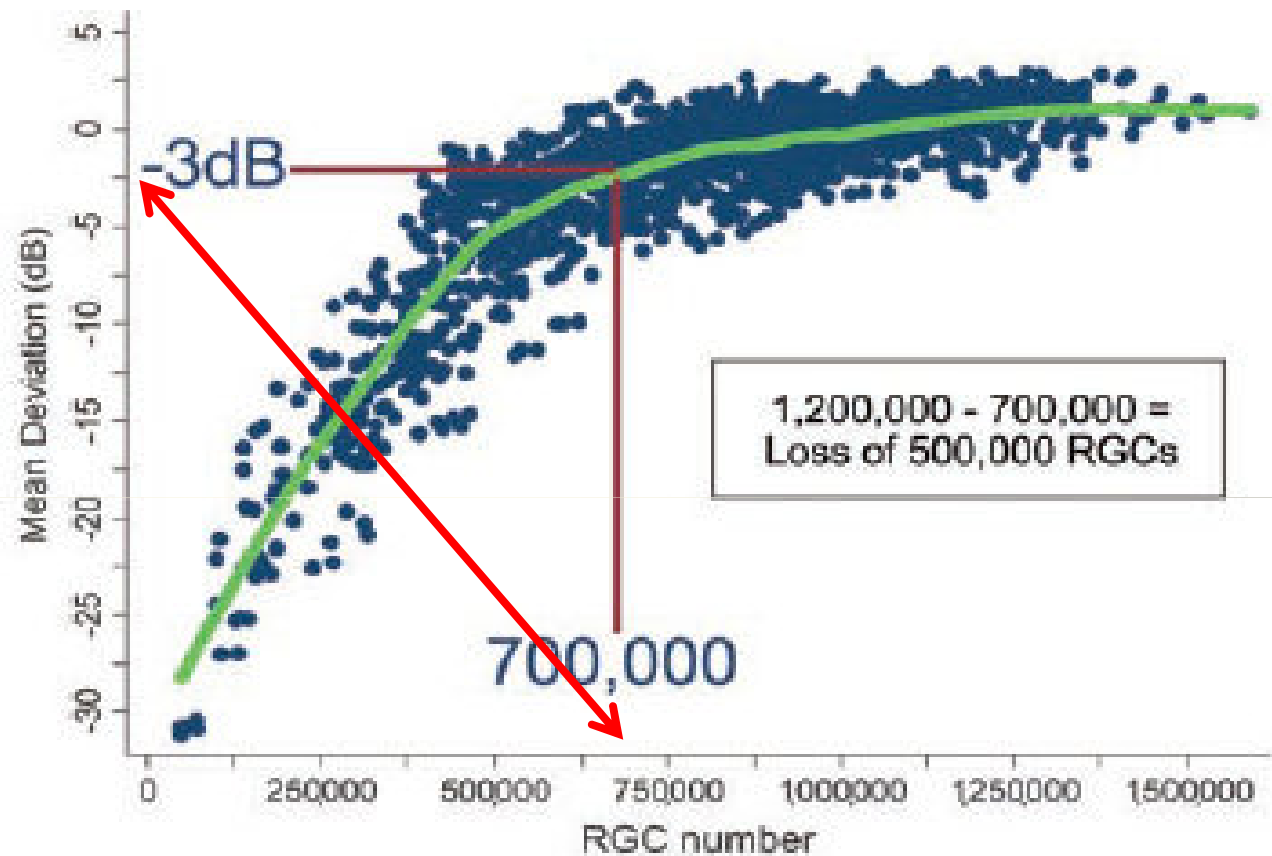
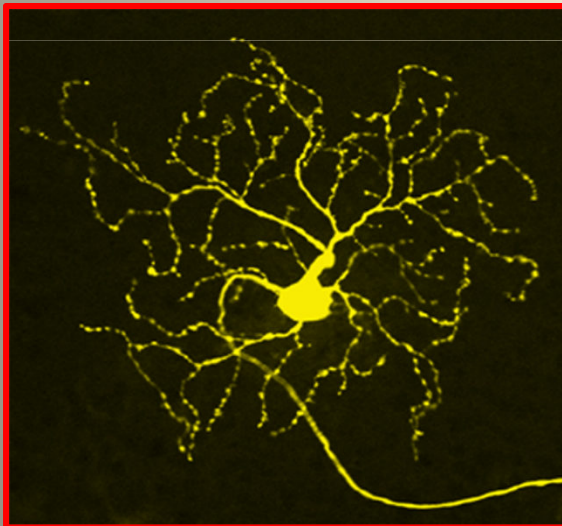
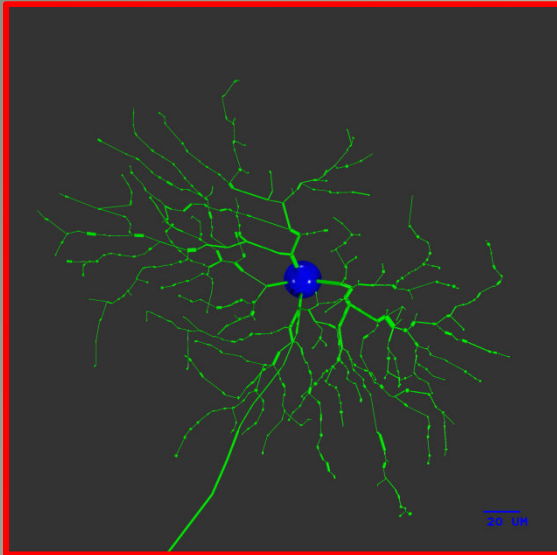


Glaucoma Continuum by R. Weinreb

Weinreb R. et al A. J. Ophthalmol 2004; 138;458-467



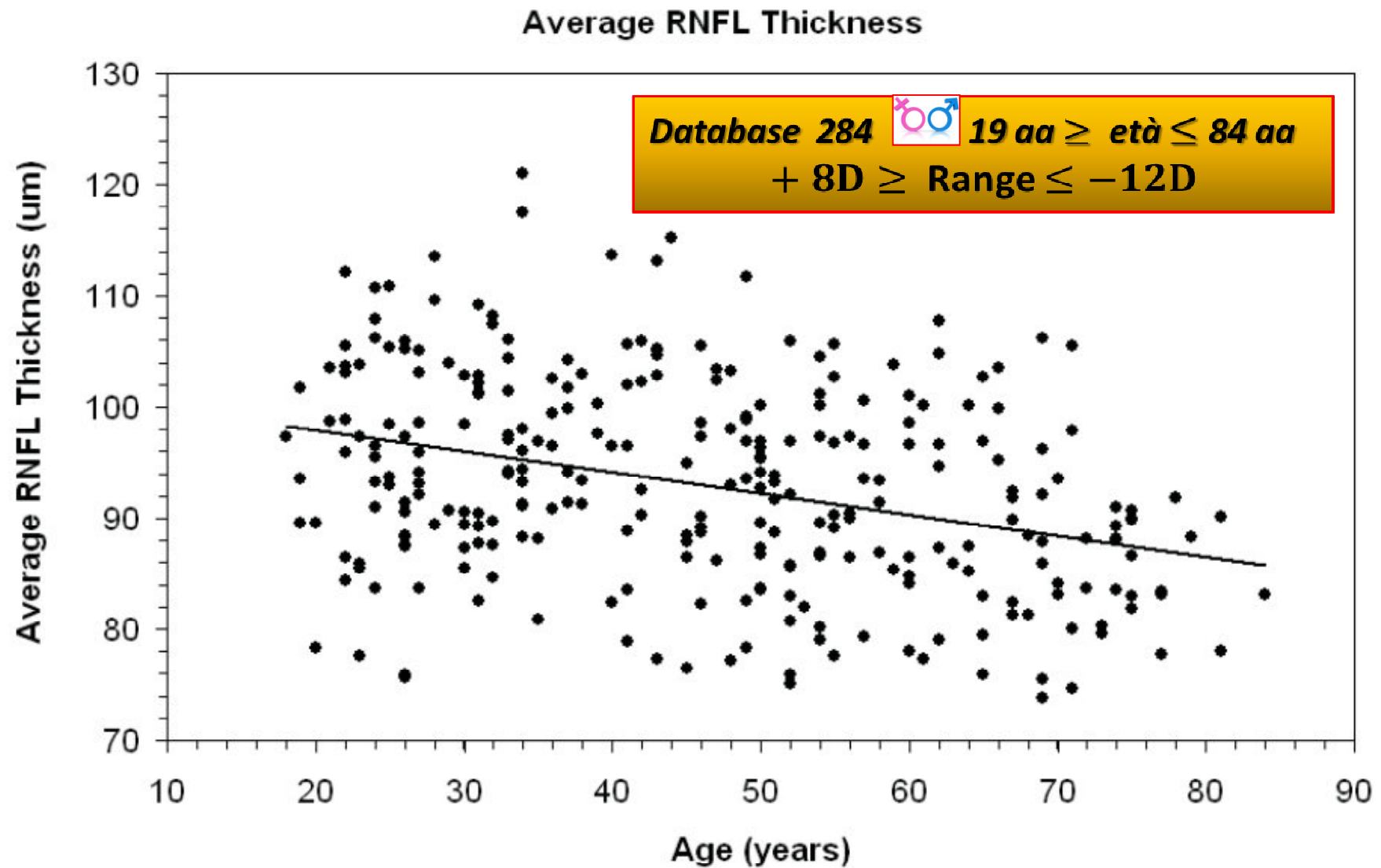
RGC & Mean Deviation



5000/9000 Retinal Ganglion Cells/Year

Adapted from Medeiros FA, Lisboa R, Weinreb RN, et al. A combined index of structure and function for staging glaucomatous damage. Arch Ophthalmol. 2012; 130 (5)

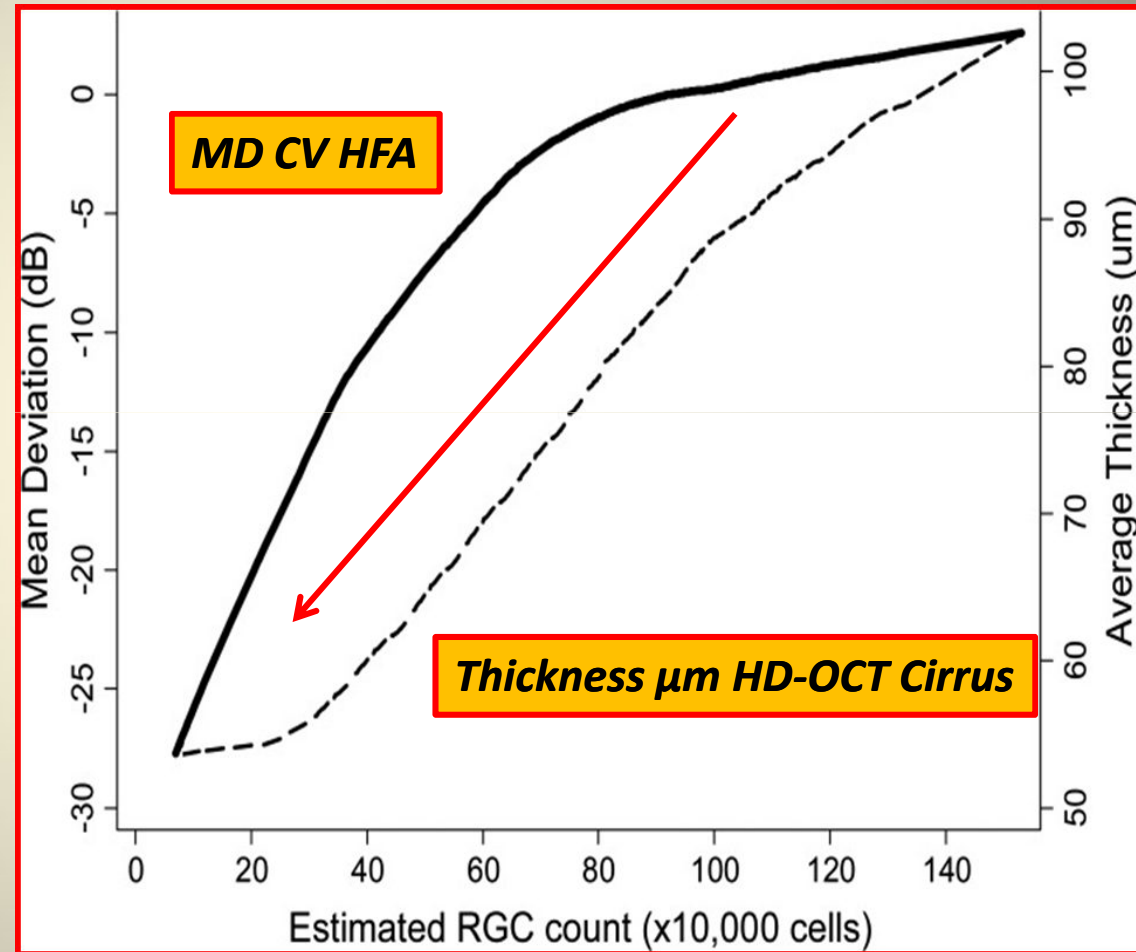
Average RNFL Thickness/Age for Cirrus



- At **early stages** of damage (**high RGC counts**), changes in estimated **RGC** counts correspond to relatively **smaller changes in MD** (continuous line) and relatively **larger changes in average RNFL** thickness (dashed line).

- At **advanced stages** of damage (**low RGC counts**), changes in estimated **RGC** counts correspond to relatively **large changes in MD**, but only **small changes in average RNFL** thickness.

Mean Deviation MD (dB)
Average Thickness (μm)
Estimated RGC count ($\times 10,000$ cells)

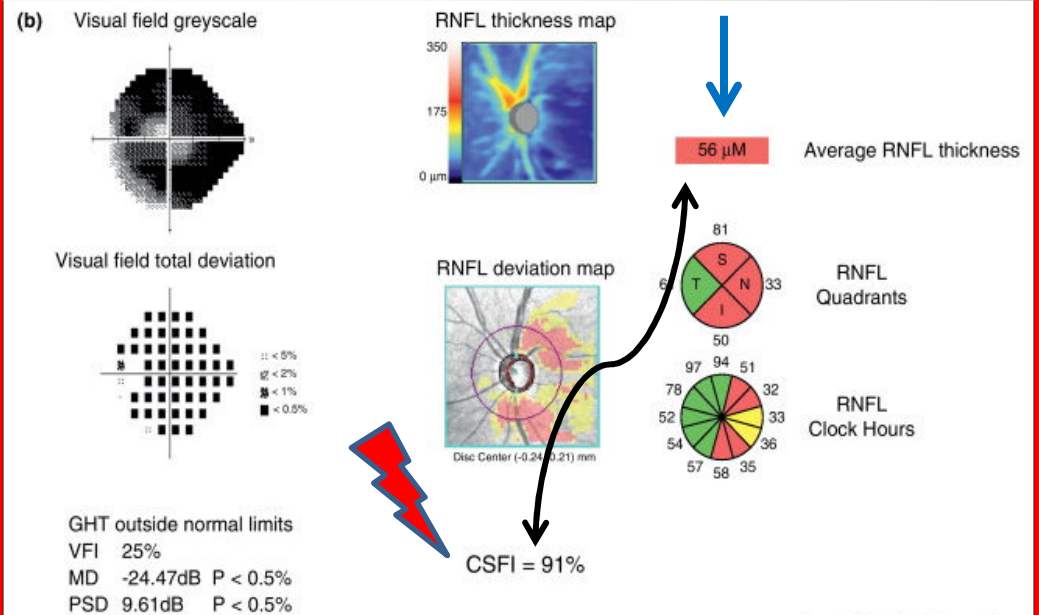
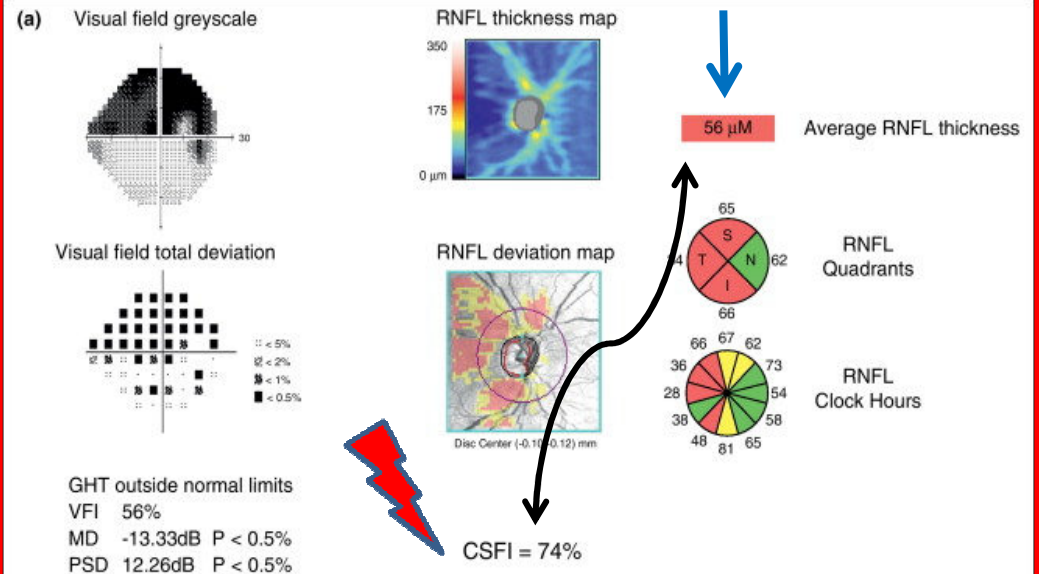


CSFI

Combined Structure Function Index

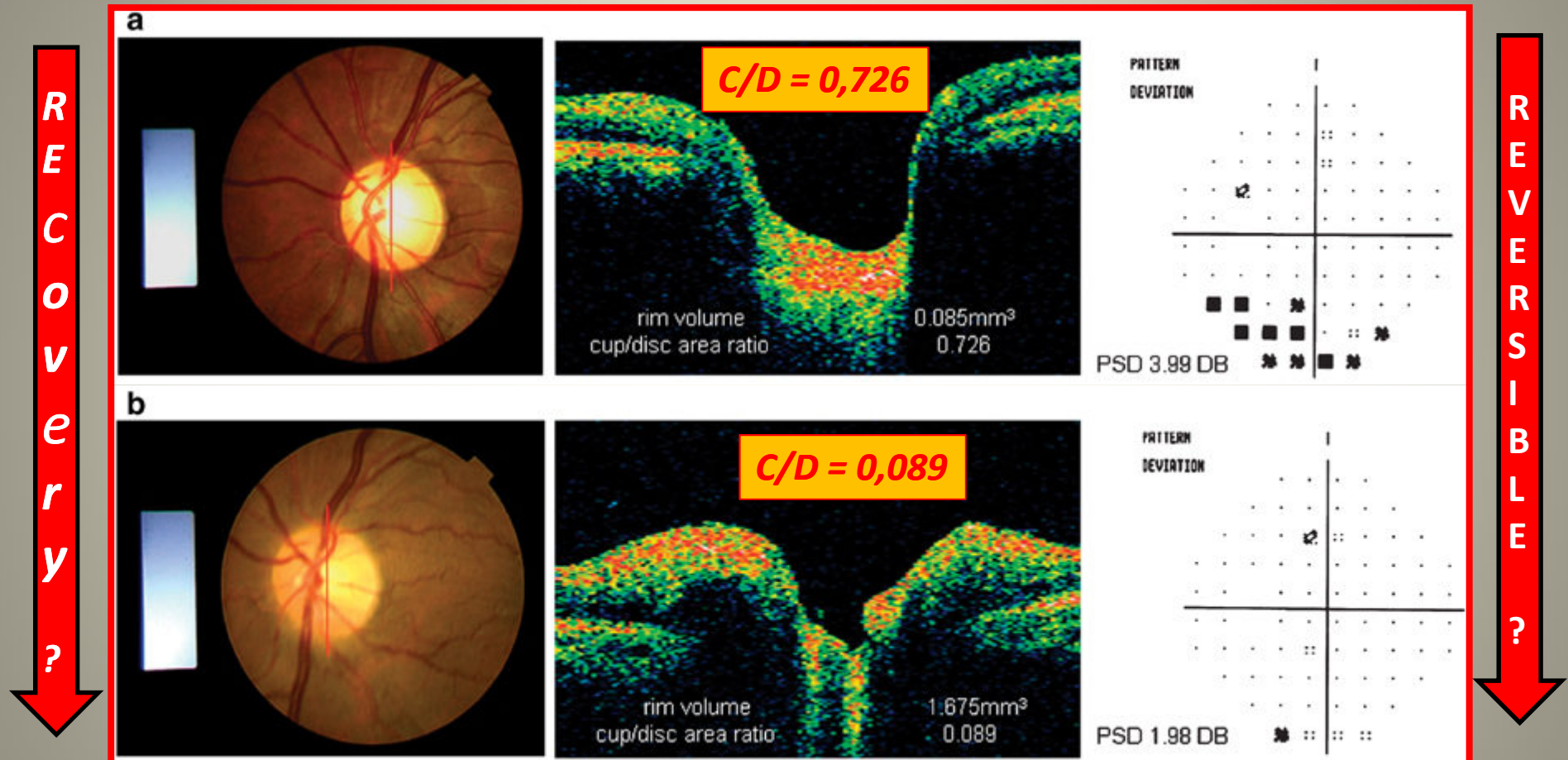
Felipe A. Medeiros, Renato Lisboa,
Robert N. Weinreb, Christopher A.
Girkin, Jeffrey M. Liebmann, Linda M.
Zangwill. *Arch Ophthalmol.* 2012

Douglas GR, Drance SM, Schulzer M.
A correlation of fields and discs in
open angle glaucoma. *Can J. O.* 1974



Structural and functional recovery in juvenile open angle glaucoma after trabeculectomy

C K S Leung, J Woo, M K Tsang and K K Tse



Fundus photographs, OCT optic nerve head scans (vertical cut) and Humphrey visual field pattern deviation plots of the left eye obtained the day before trabeculectomy (a) and 1 week postoperatively (b). The red lines on the fundus photographs indicate the location of the OCT scans in the middle panel. *Eye (Lond)*. 2006 Jan;20(1):132-4

Structural and functional recovery in juvenile open angle glaucoma after trabeculectomy

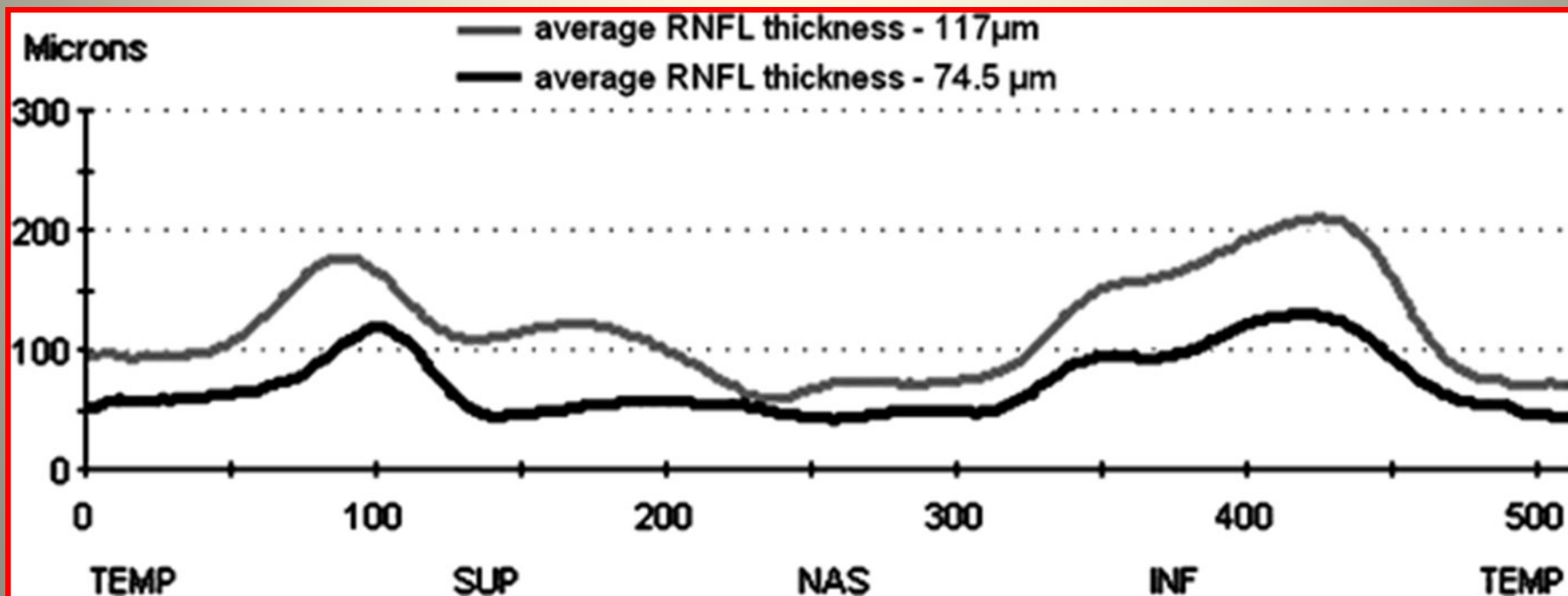
C K S Leung, J Woo, M K Tsang and K K Tse Eye (Lond). 2006 Jan;20(1):132-4

buffer-zone

=

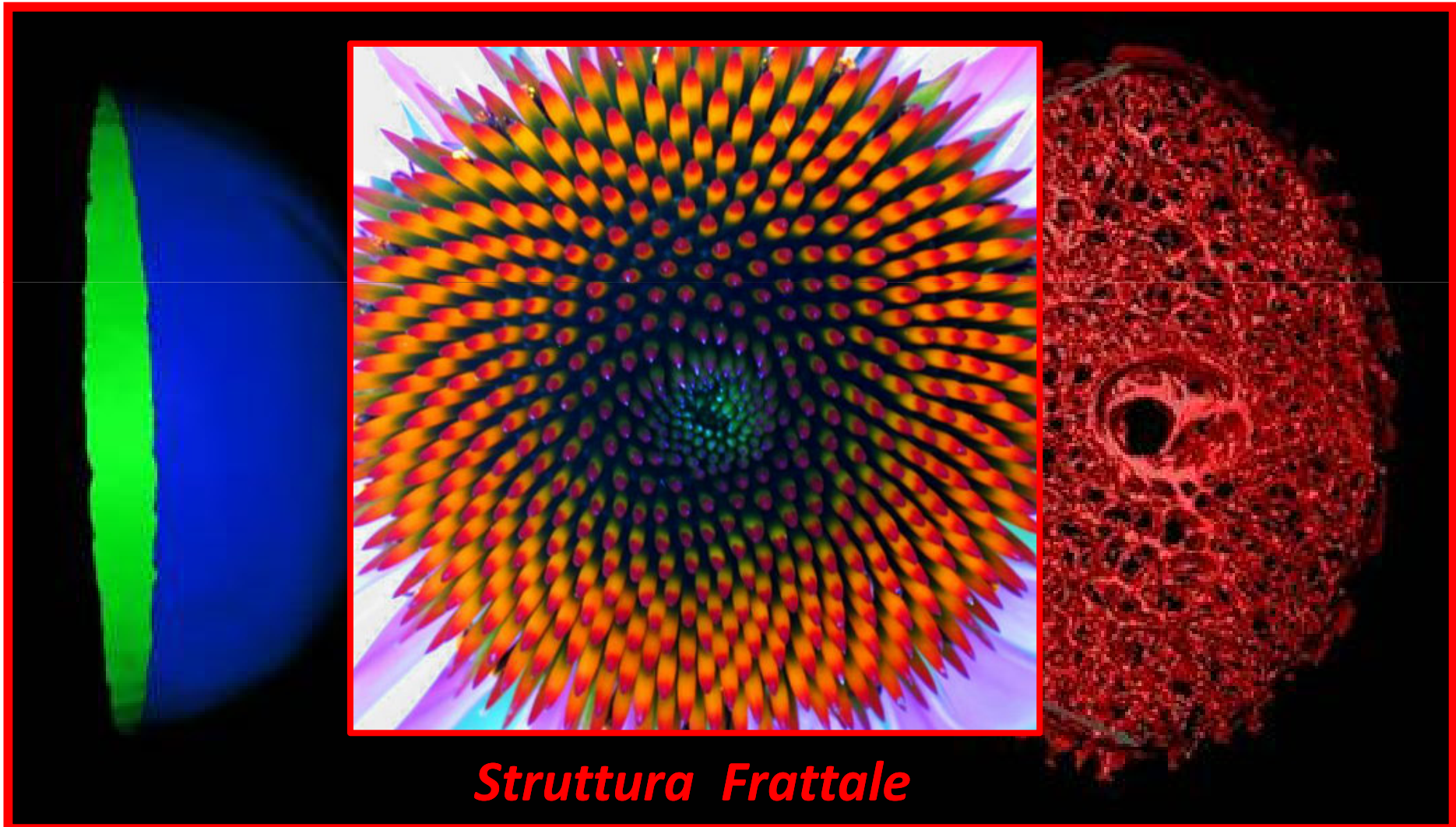
A time interval in which optic nerve damage can be reversed by appropriate interventions.

Reversal is likely to be dependent on the **degree of IOP reduction**, the **age of presentation**, and may vary with the **compliance of the lamina cribrosa** and the **composition of supporting tissue** of retinal ganglion cells.



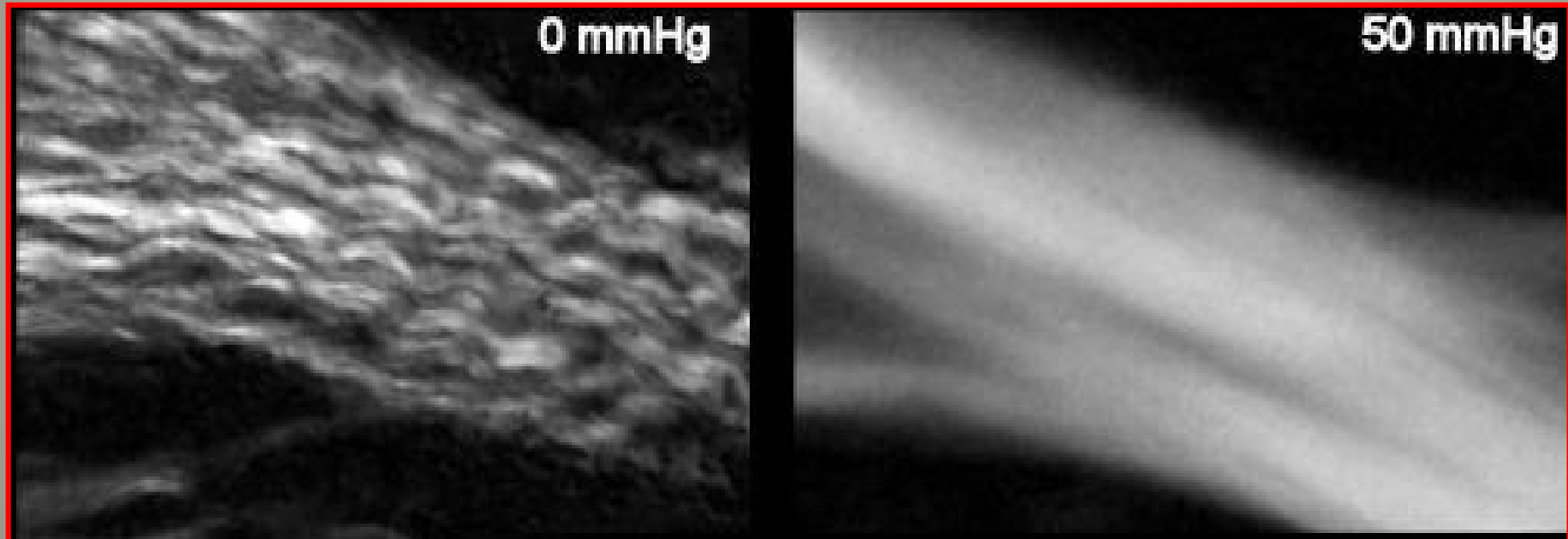
Finite Element Modeling of the Lamina Cribrosa of the Optic Nerve Head in Glaucoma

**Devers Eye Institute / National Institute of Health Optic Nerve Head Research Laboratory
directed by Dr. Claude Burgoyne (Portland Oregon)**



IOP Elevation Reduces the Waviness of the Load Bearing Collagen Fibers in the Lamina Cribrosa

Ian A. Sigal et al. ARVO 2013 Annual Meeting Abstracts



Collagen fibers with and without crimp

Racial Differences in Mechanical Strain in the Posterior Human Sclera

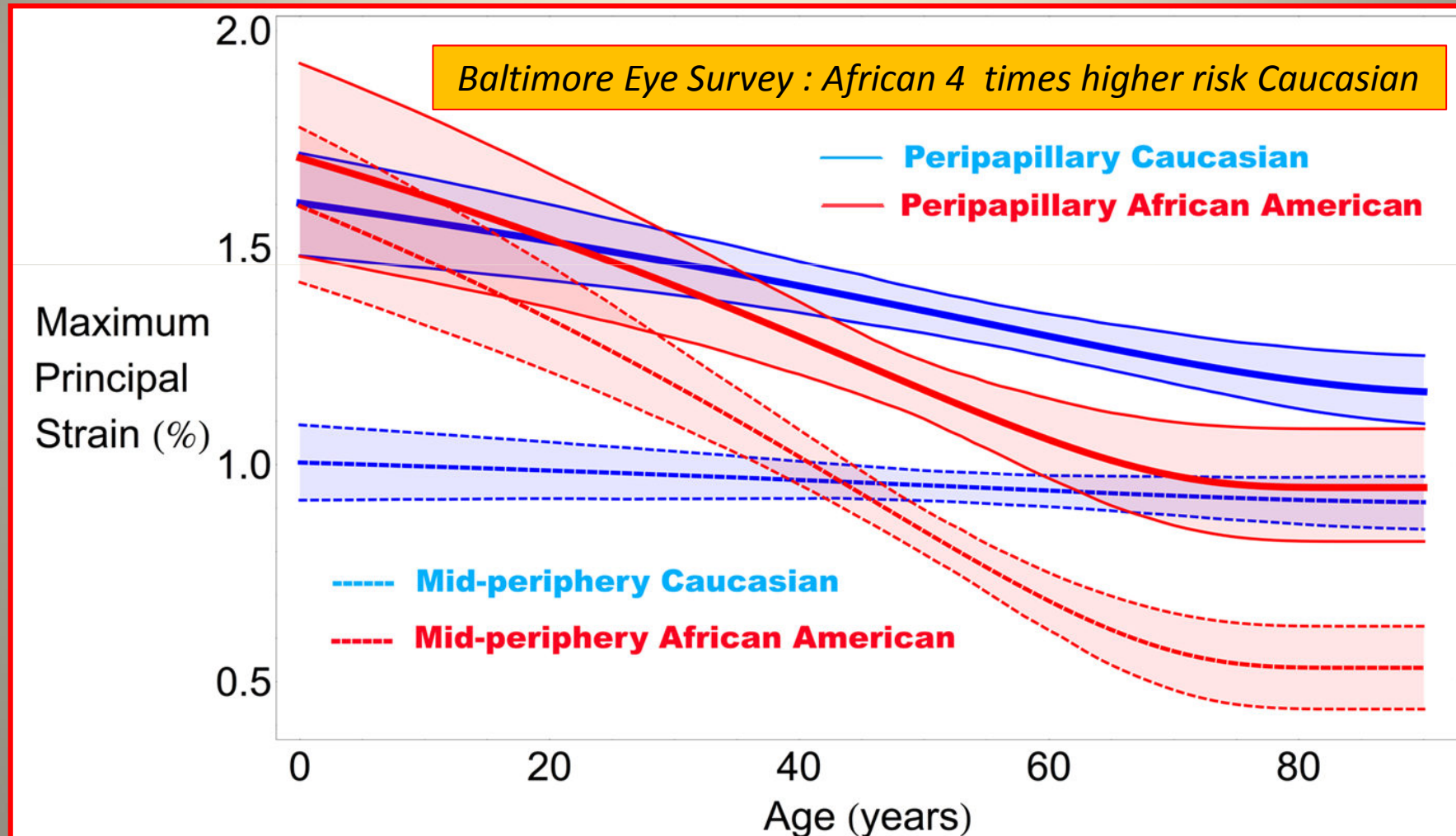
M. A. Fazio **1-2**, R. Grytz **1**, L. Bruno **2**, J. S. Morris **3**, C. A. Girkin **2**, J. Crawford C. Downs **2**.

1 Ophthalmology, The University of Alabama in Birmingham, Birmingham, AL;

2 Mechanical Engineering, University of Calabria, Cosenza, Italy;

3 Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, TX.

ARVO 2013 Annual Meeting Abstracts



Inner and outer retina

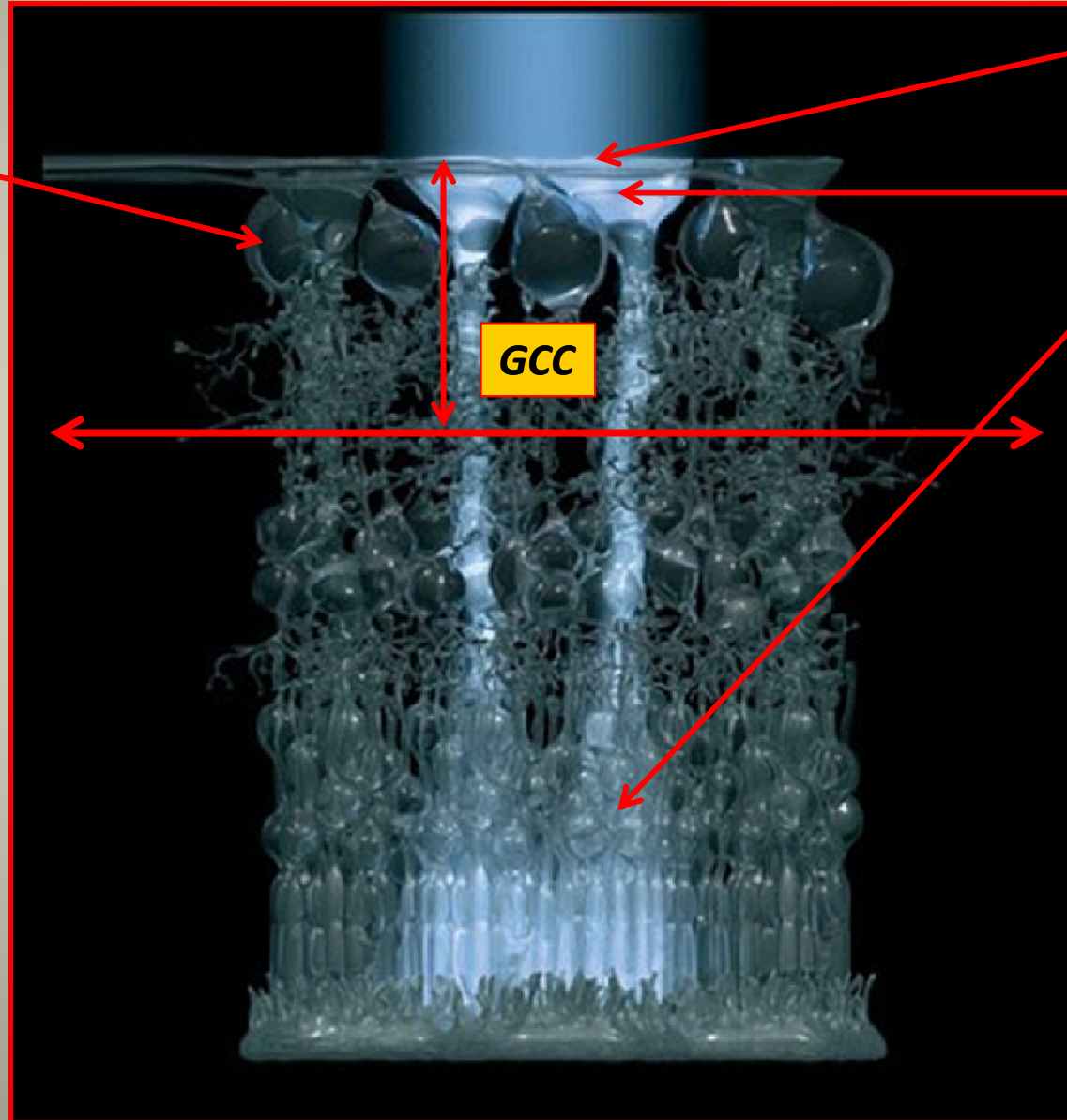
MLI

Ganglion Cells

Müller Cells

GCC

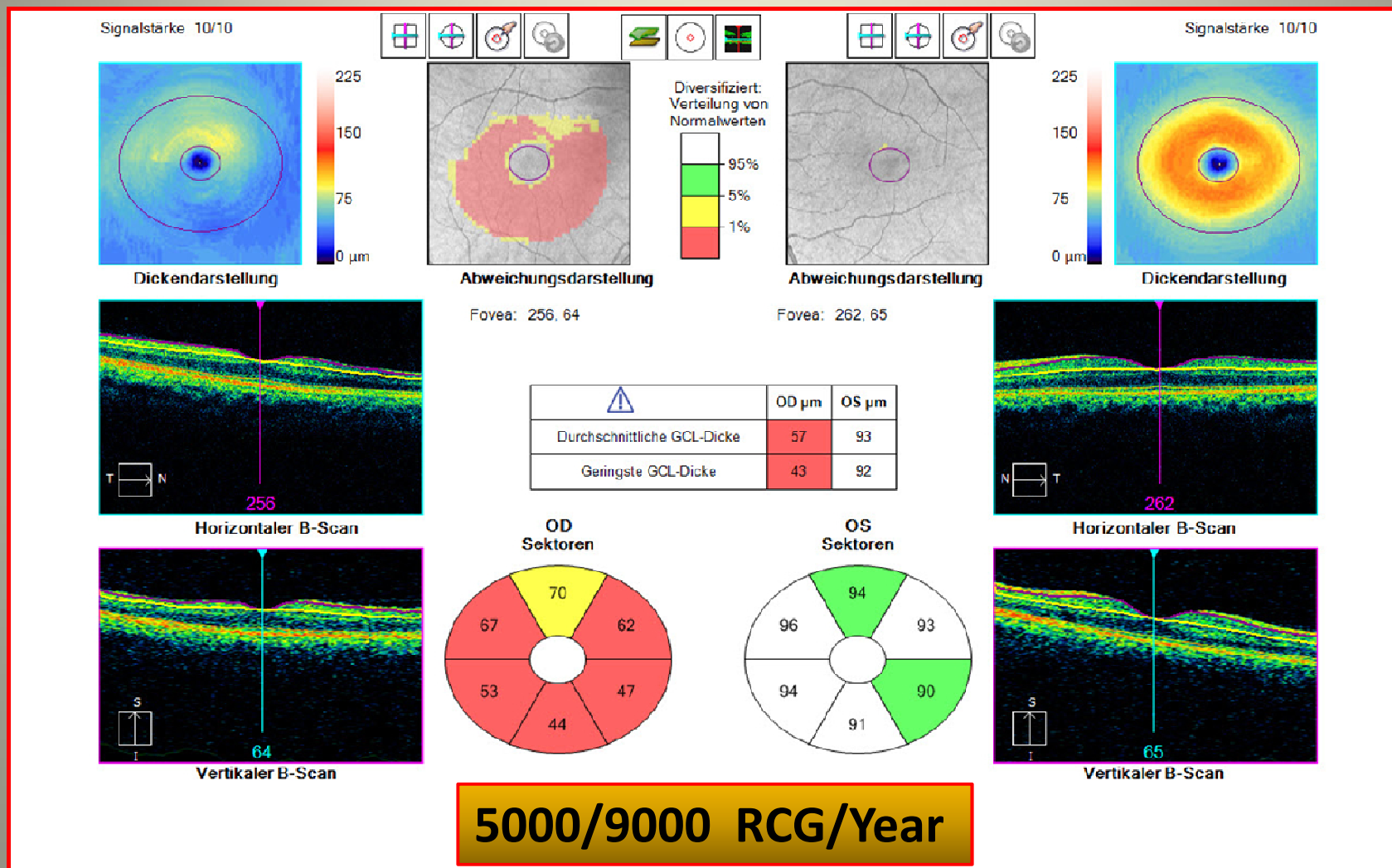
IPL



Ganglion Cell Analysis Report for Cirrus

6 quadranti

90% RCG parve 50% in macula



AS HD-OCT

Nome: _____

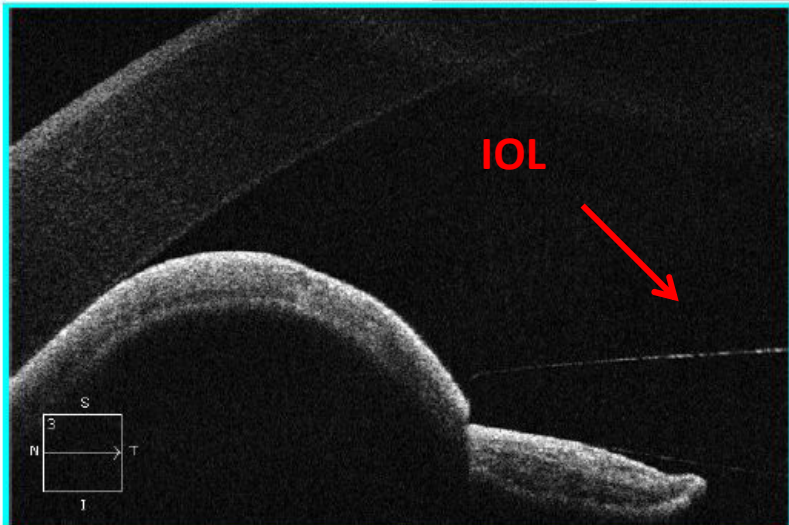
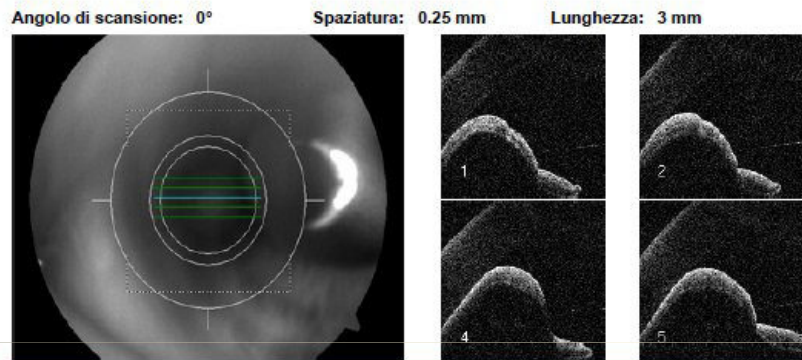
ID: 875950848 Data esame: 21/10/2013 dr Amedeo Lucente 

Data di nascita: 24/07/1959 Ora dell'esame: 17:04

Sesso: Uomo Numero di serie: 600-1083222

Medico: Intensità segnale: N/A

Immagini ad alta definizione: Anterior Segment 5 Line Raster OD OS




Commenti

Firma del medico _____

X3bz
SW Ver: 1.5.2.1377
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Pagina 1 di 1

Nome: _____

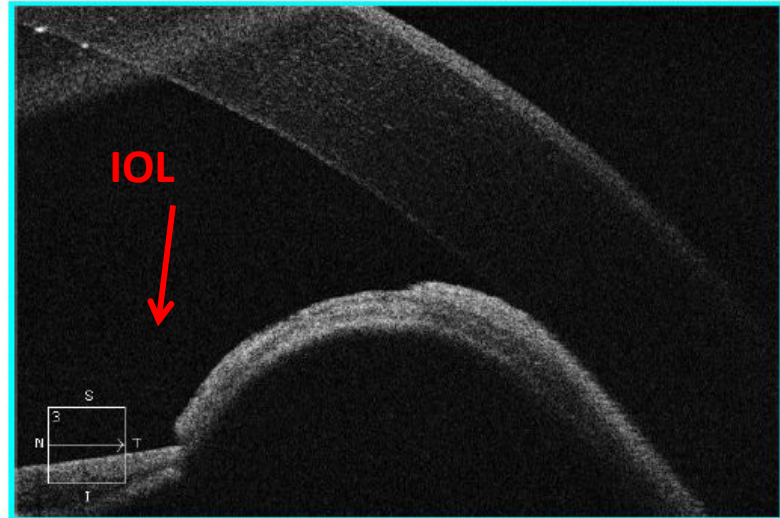
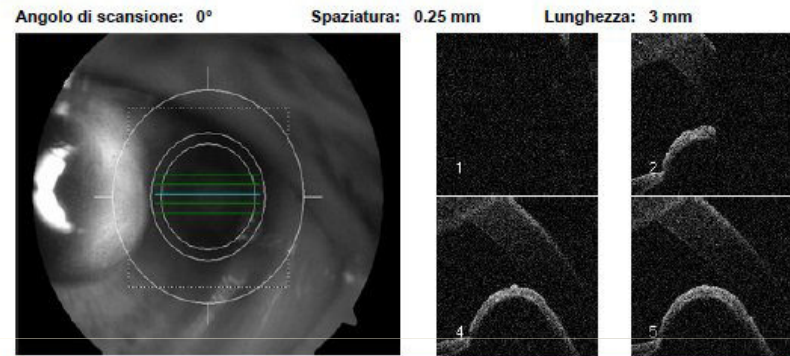
ID: 875950848 Data esame: 21/10/2013 dr Amedeo Lucente 

Data di nascita: 24/07/1959 Ora dell'esame: 17:02

Sesso: Uomo Numero di serie: 600-1083222

Medico: Intensità segnale: N/A

Immagini ad alta definizione: Anterior Segment 5 Line Raster OD OS



Commenti

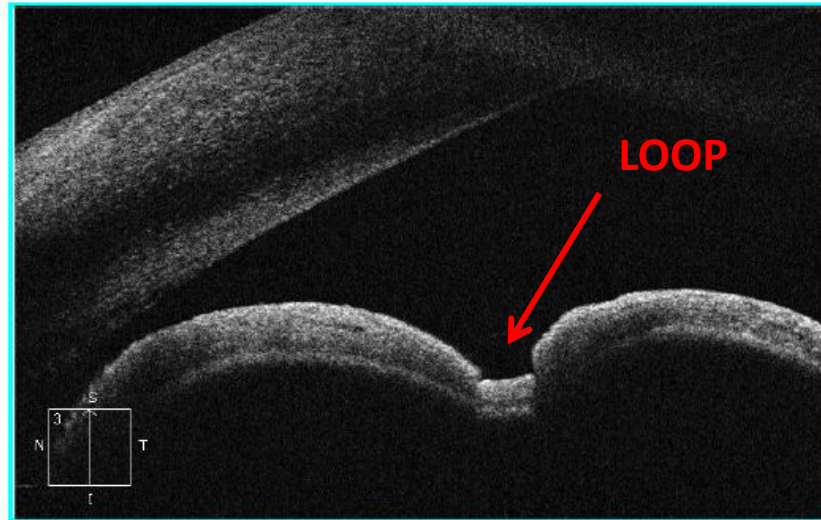
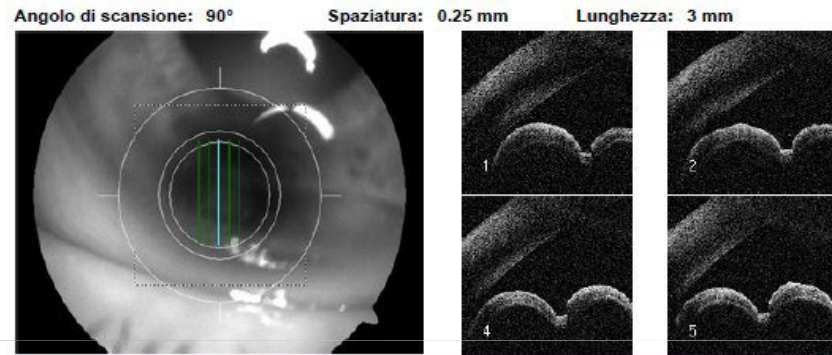
Firma del medico _____

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Pagina 1 di 1

AS HD-OCT

Nome: ZEISS
ID: 875950848 Data esame: 21/10/2013 dr Amedeo Lucente
Data di nascita: 24/07/1959 Ora dell'esame: 17:05
Sesso: Uomo Numero di serie: 600-1083222
Medico: Intensità segnale: N/A

Immagini ad alta definizione: Anterior Segment 5 Line OD OS
Raster

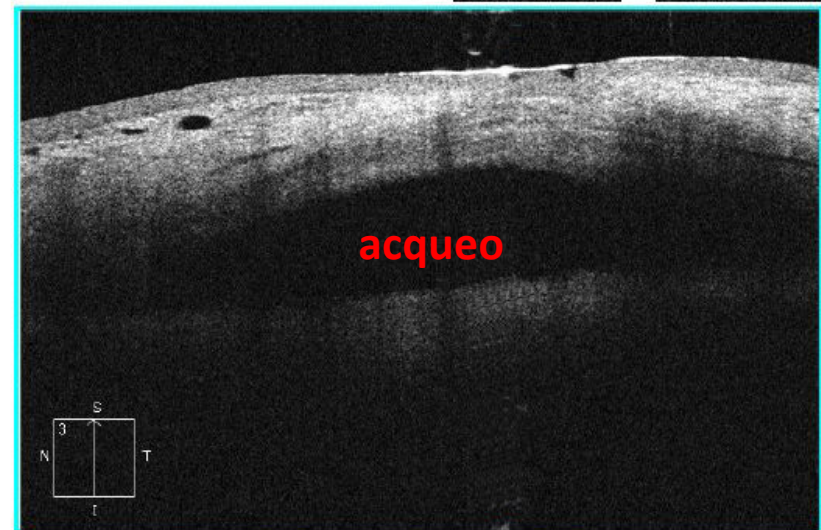
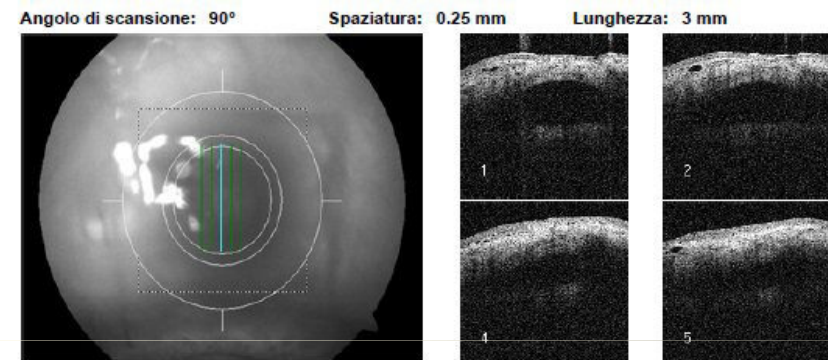


Commenti

Firma del medico
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Pagina 1 di 1

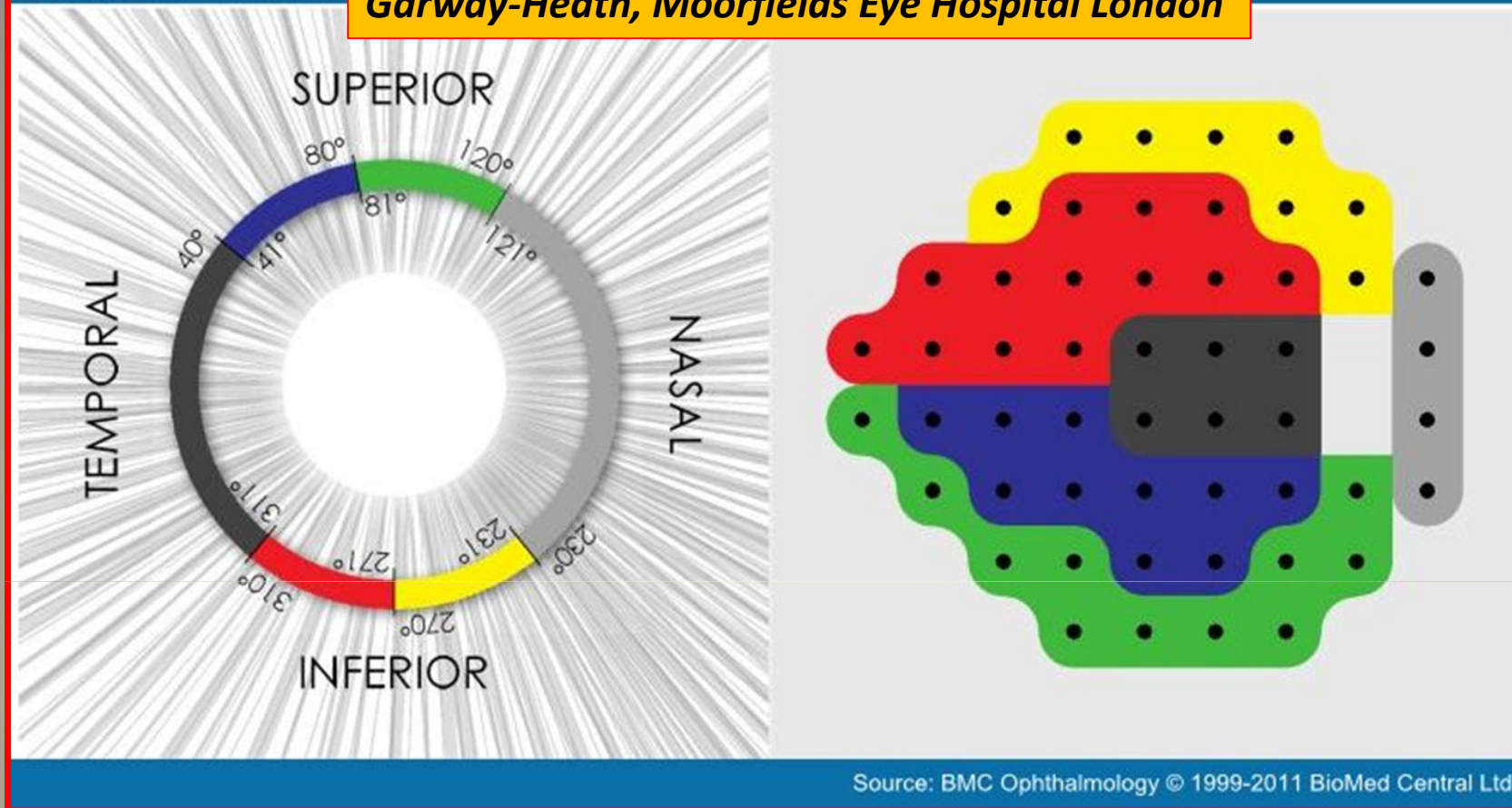
Nome: ZEISS
ID: 1786419212 Data esame: 07/11/2013 dr Amedeo Lucente
Data di nascita: 14/01/1945 Ora dell'esame: 15:42
Sesso: Uomo Numero di serie: 600-1083222
Medico: Intensità segnale: N/A

Immagini ad alta definizione: Anterior Segment 5 Line OD OS
Raster



Commenti

Firma del medico
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Pagina 1 di 1



Map representing the **relationship between Standard Automated Perimetry** visual field sectors and sections of the **peripapillary OCT scan circle**. This map is based on the **work of Garway-Heath et al** and shows the correspondence **between areas of the visual field and peripapillary retinal nerve fiber layer** due to the anatomical configuration of the retinal nerve fiber bundles.

First Release : Presented in part at the Glaucoma Society (UK & Eire) Annual Meeting, London, England, November **1998**

Six corresponding *regions* of *neuroretinal rim area (A)*, *peripapillary retinal nerve fiber layer (B)*, and *visual field (C)*, used to measure the structure–function relationship (based on structure–function map introduced by *Garway-Heath* et al.)
Nilforushan N et al. Invest Ophthalmol Vis Sci. 2012 May

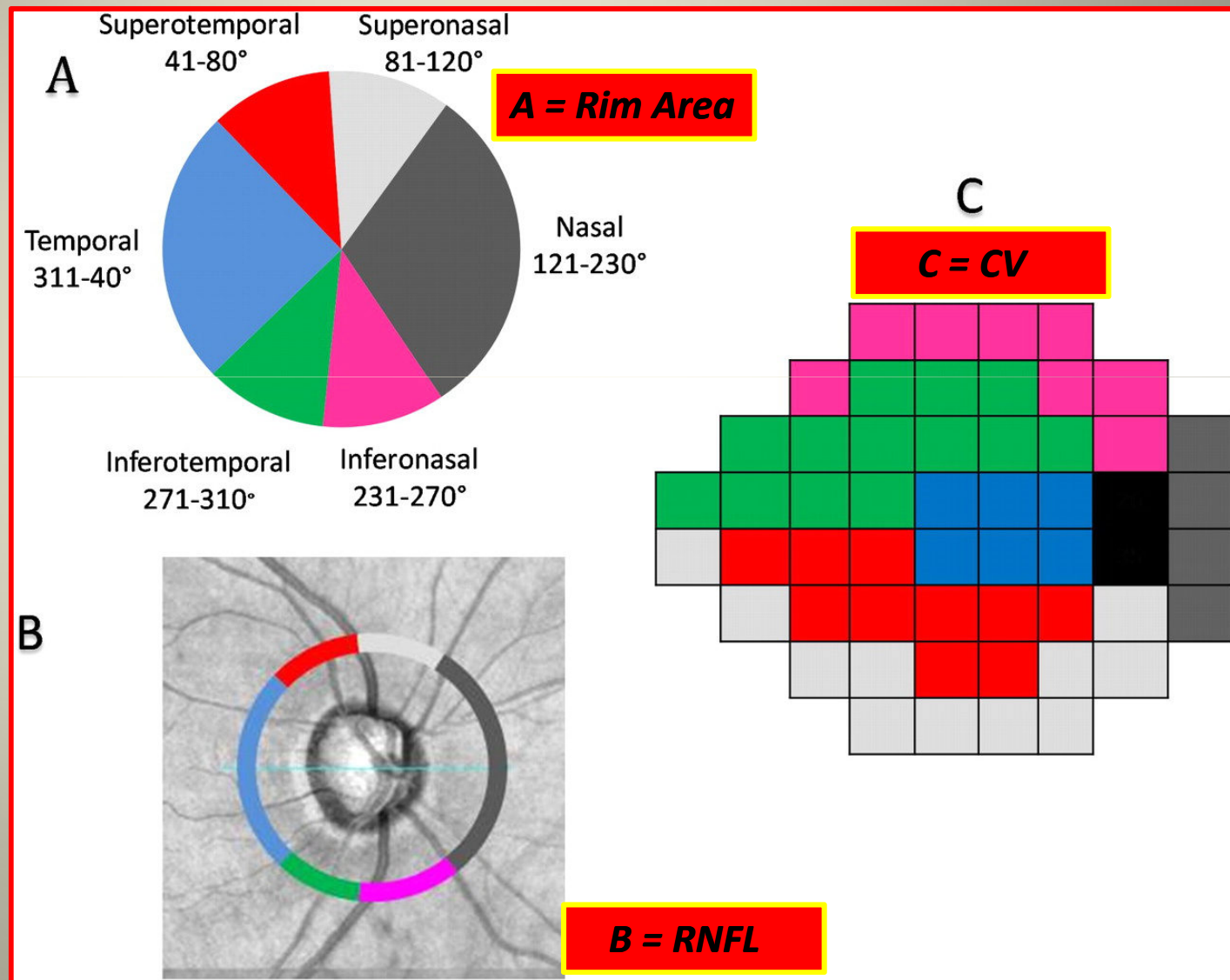
ST + SN : 80°+

IN + IT : 80° +

Nasal : 110° +

Temporal : 90° =

Rim / RNFL: 360°

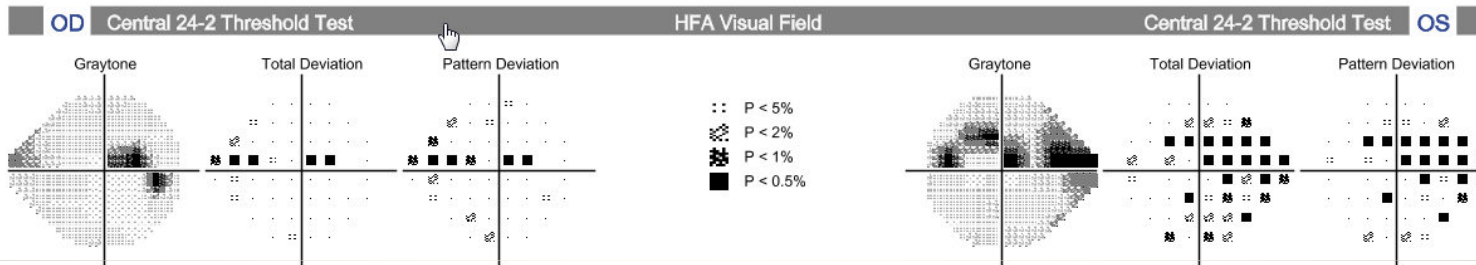


Forum Glaucoma Workplace

Combined structure and function reports

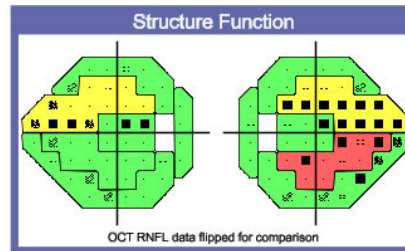
A. Lucente

Patient: DEMO FGW, 01
 Date of Birth: Aug 17, 1934
 Gender: Male
 Patient ID: 64854



FP: 11%
 FN: 9%
 VFI: 90%

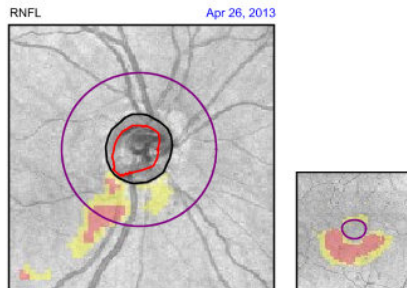
MD: -2.09 dB P < 5%
 PSD: 6.76 dB P < 0.5%
 GHT: Outside Normal Limits



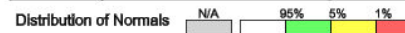
FP: 2%
 FN: 6%
 VFI: 77%

MD: -7.58 dB P < 0.5%
 PSD: 9.81 dB P < 0.5%
 GHT: Outside Normal Limits

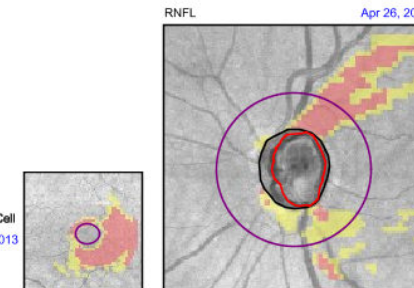
OD CIRRUS HD-OCT



OD		OS
88µm	Average RNFL Thickness	80µm
0.72	Average C/D Ratio	0.83
0.88mm²	Rim Area	0.75mm²
0.66	Vertical C/D Ratio	0.92
0.400mm³	Cup Volume	1.021mm³
1.81mm²	Disc Area	2.26mm²



OS CIRRUS HD-OCT



Comments

Database HFA : 422 ≥ 18aa età ≤ 89aa + 5D ≥ Range ≤ + 5D



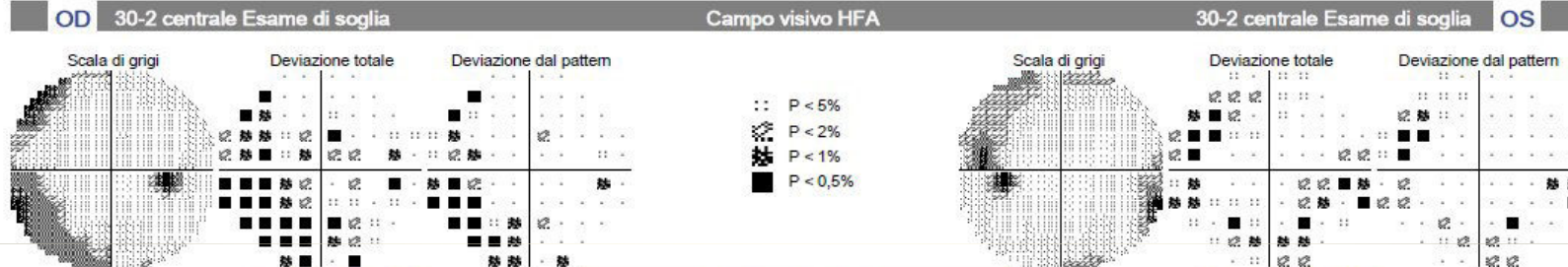
Forum Glaucoma Workplace

Combined structure and function reports

Paziente:
 DDN: 14-feb-1972
 Sesso: Altro
 ID: 1972.0214.AFF7.0869.5824.4FE9



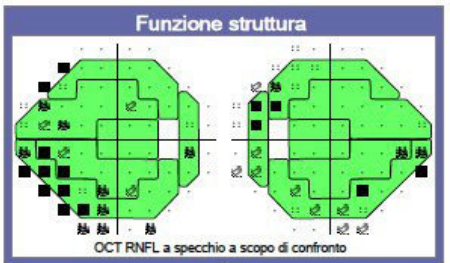
A. Lucente



15-ott-2013 SITA-Standard

FP: 3%
 FN: 13%
 VFI: 91%

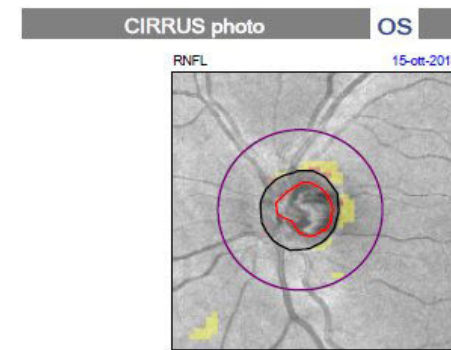
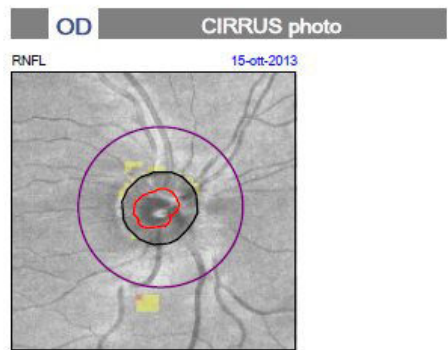
MD: -6,43 dB P < 0,5%
 PSD: 6,79 dB P < 0,5%
 GHT: Fuori limiti normali



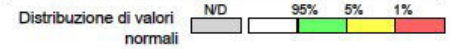
15-ott-2013 SITA-Standard

FP: 5%
 FN: 6%
 VFI: 93%

MD: -4,76 dB P < 0,5%
 PSD: 4,92 dB P < 0,5%
 GHT: Fuori limiti normali



OD		OS
94µm	Spessore RNFL medio	93µm
1,31mm²	Area della rima	1,27mm²
1,94mm²	Area del disco	2,24mm²
0,56	Rapporto C/D medio	0,66
0,51	Rapporto C/D verticale	0,68
0,213mm²	Volume di escavazione	0,433mm²

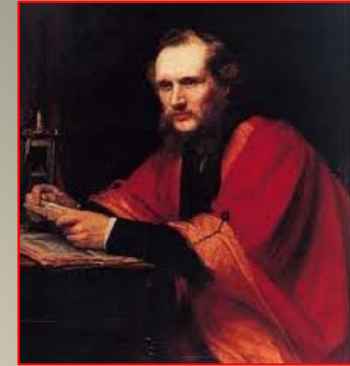


Commenti

Firma

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Lord William Thomson Kelvin (1824/1907)



« When you can measure what you speaking about and express it in numbers you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind»

«Possiamo conoscere qualcosa dell'oggetto di cui stiamo parlando solo se possiamo eseguirvi misurazioni, per descriverlo mediante numeri; altrimenti la nostra conoscenza è scarsa e insoddisfacente»

93° Congresso Nazionale SOI

Corso ZEISS

Extensive OCT under standing: retina, miopia, neuroftalmologia, glaucoma

Glaucoma tra struttura e funzione: la risposta degli OCT

Grazie per l'attenzione

dott. A. Lucente

No financial interst

1