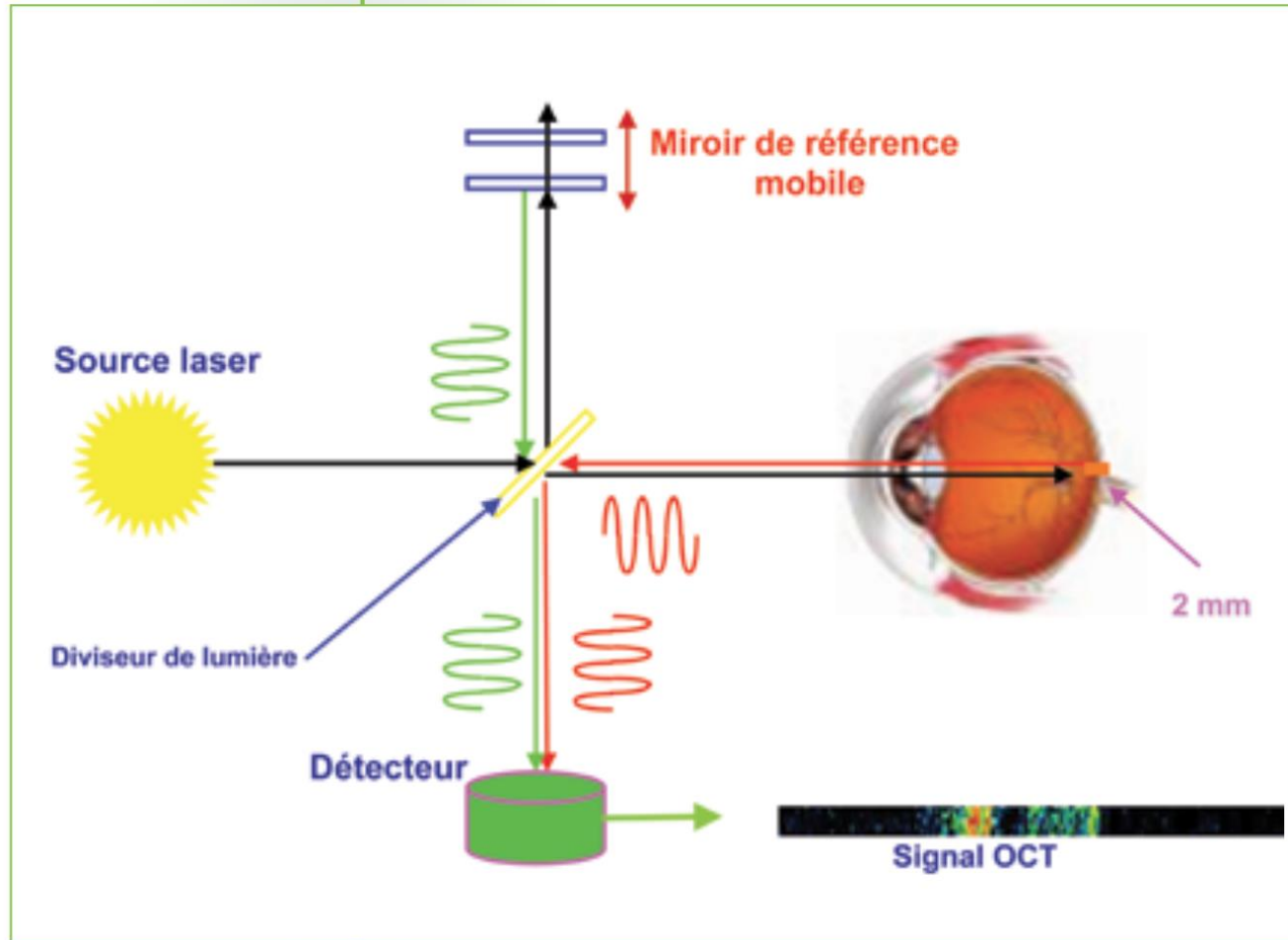


Optical coherence tomography OCT bij glaucoom en neurologie

TOA dag 21-4-2018

Esther Kuiper

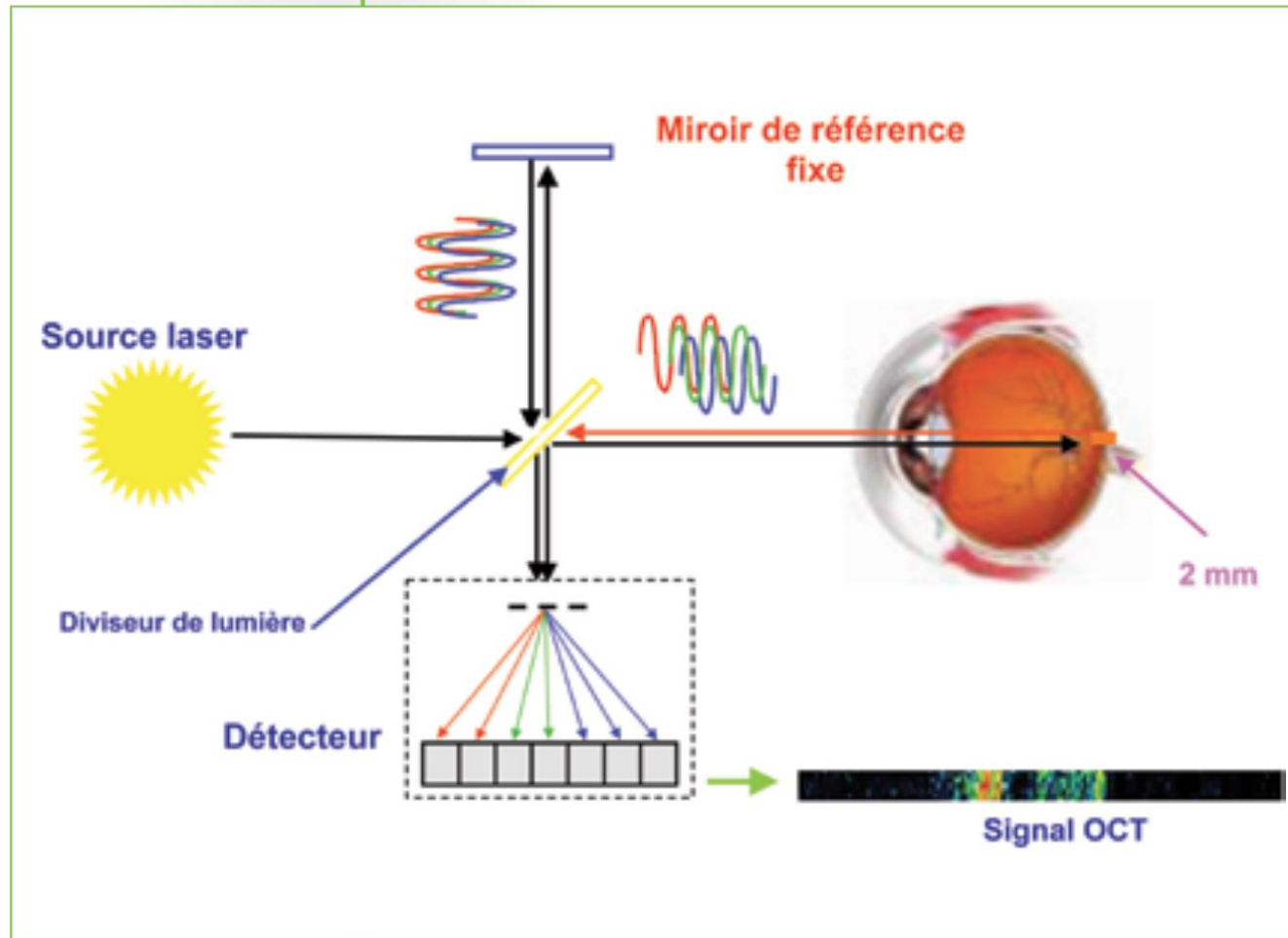
In the beginning .. 1990 (Huang)



Acquisition of an A-scan: time domain OCT, in which a reference mirror moves to successively study the different depths of the retina.

Figure 2

Fourier domain ofwel spectral domain

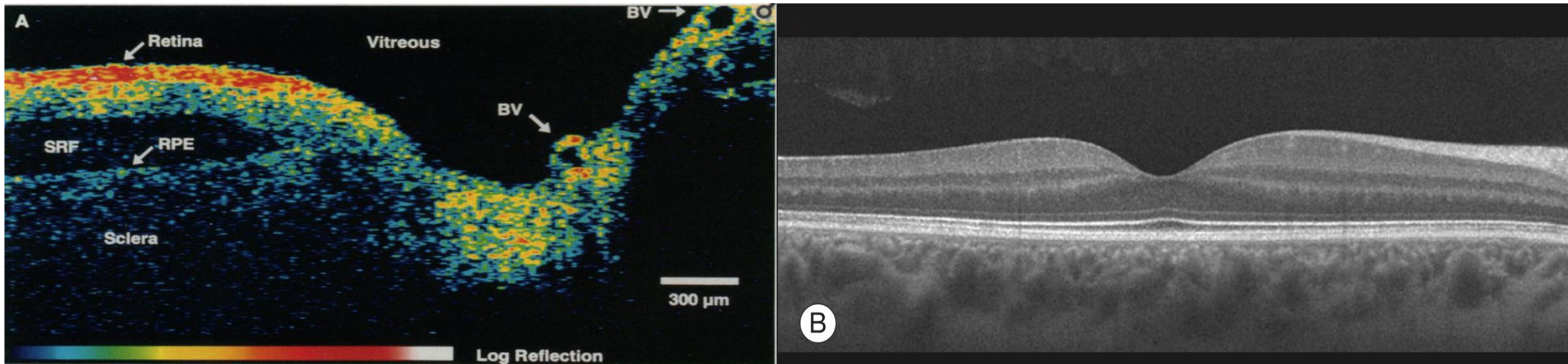


Acquisition of an A-scan: spectral domain OCT, in which the reference mirror is fixed and the different depths of the retina are analysed at the same time.

Figure 3

Verskil time domain vs spectral domain

- TD 1 pixel vs SD 2000 pixels in zelfde tijd
 - ⇒ hogere resolutie & sneller
 - ⇒ meer details en minder bewegingsartefacten



OCT blijft een Model van de werkelijkheid

- Instrument om ons te helpen te objectiveren van wat we zien..
- Model is nooit de werkelijkheid.

Klinische parameters detectie glaucoom (progressie)



Dikte neuroretinale rim ↔
Oppervlakte neuroretinale rim

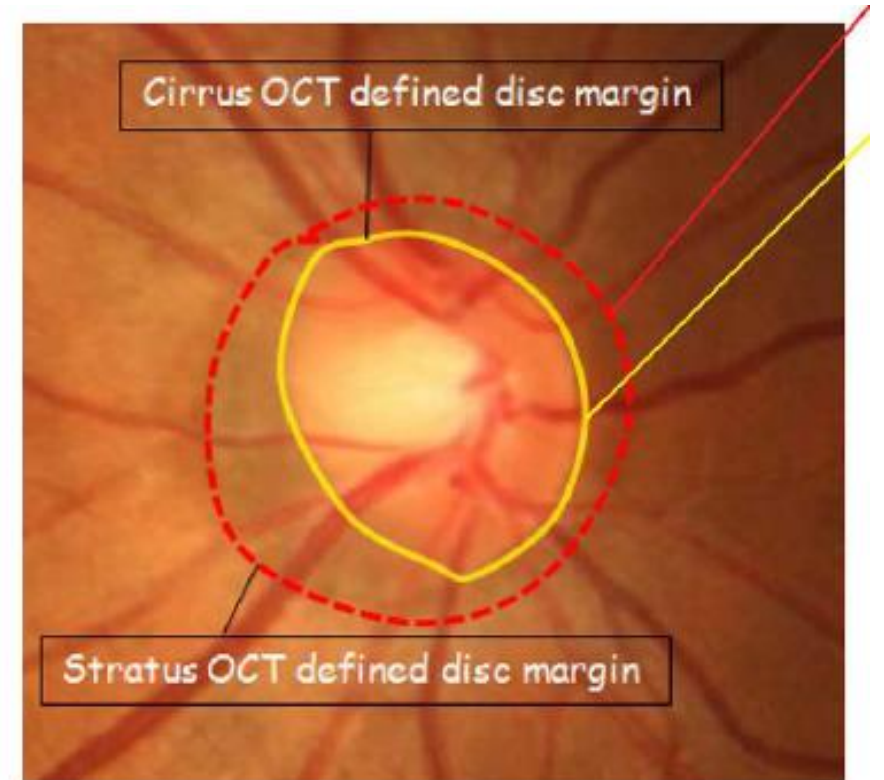
Cup-disc ratio

Dikte zenuwvezellaag

Dikte ganglioncellaag

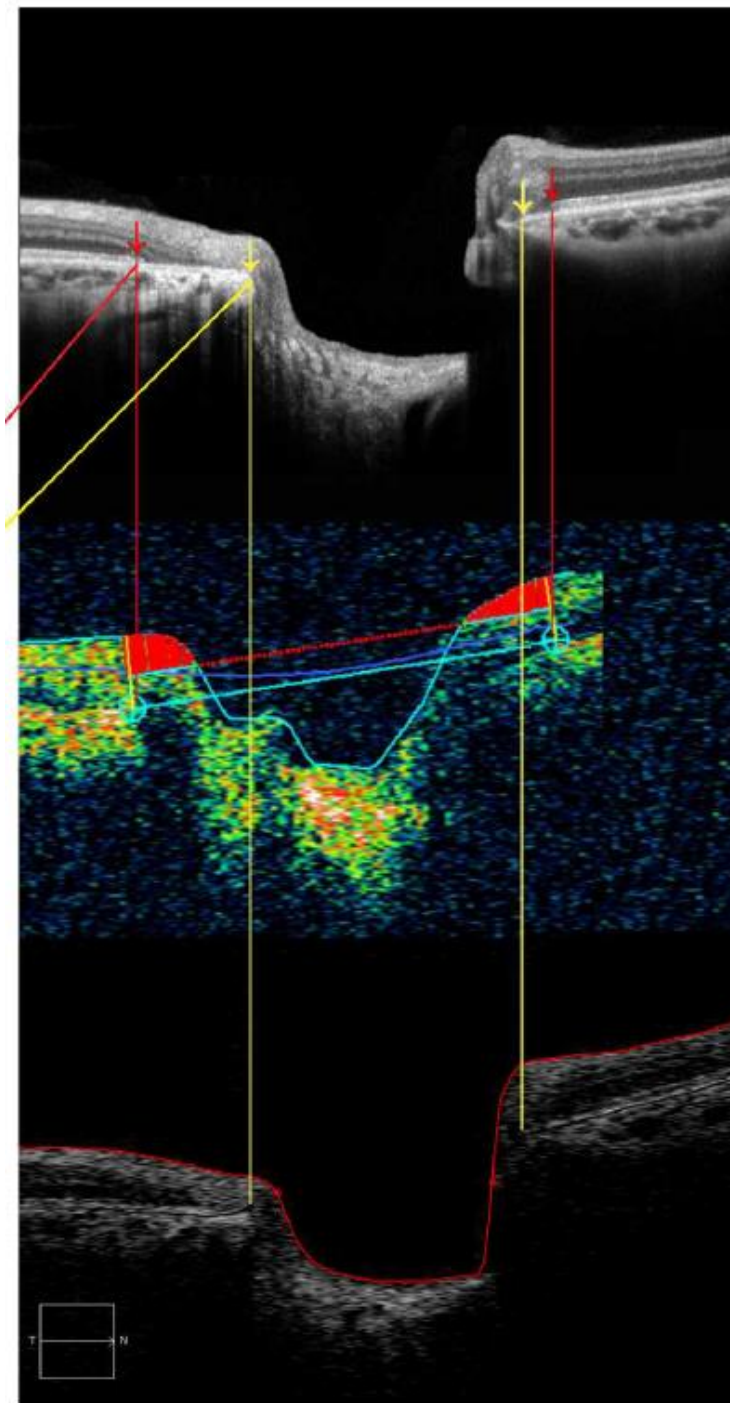
Hoe bepaalt OCT rand oogzenuw ? (neuroretinale rim)

- Stratus (Time domain) pakt rand RPE
- Cirrus (Spectral domain) pakt einde Bruchsmembrane



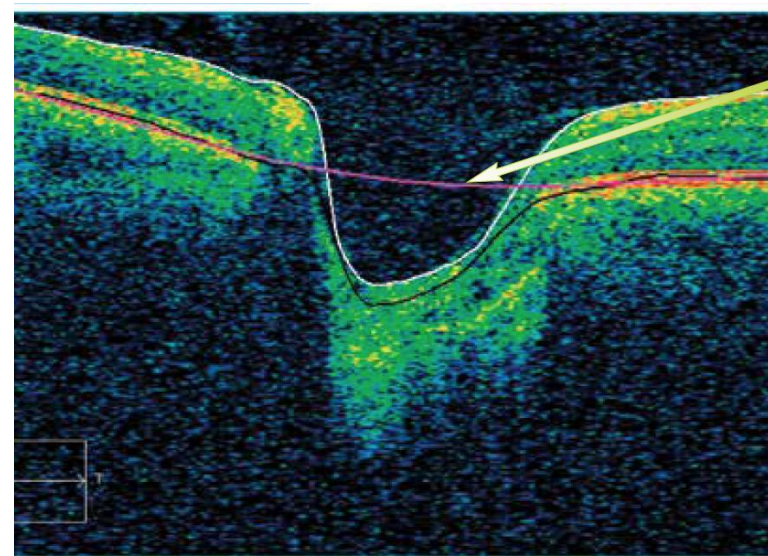
doorsnede

- Heidelberg SLO
- TD (stratus)
- Cirrus



Vroeger

- De cup werd bepaald alles onder een arbitraire referentie lijn van 150 μm boven peri papillair pigment epitheel (vroeger)



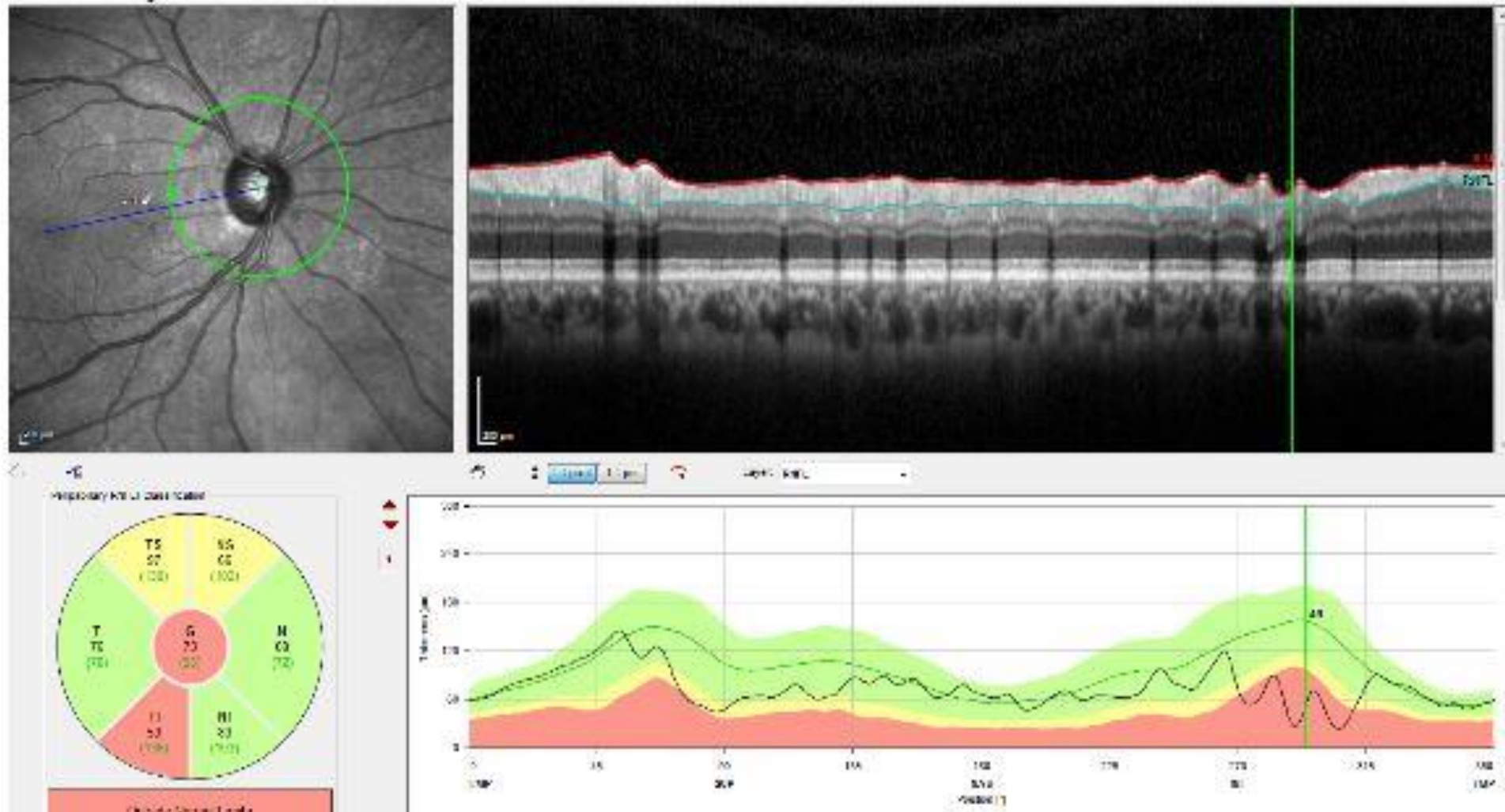
The papillary region is even, and the pink line clearly marks the boundary between the retina and the cavity.

The normal configuration of the eye on OCT.

Figure 5

- Nu direct measurement retinal nerve fibers

Beoordeling papil Heidelberg- OCT



Zenuwvezel-laag meting OCT

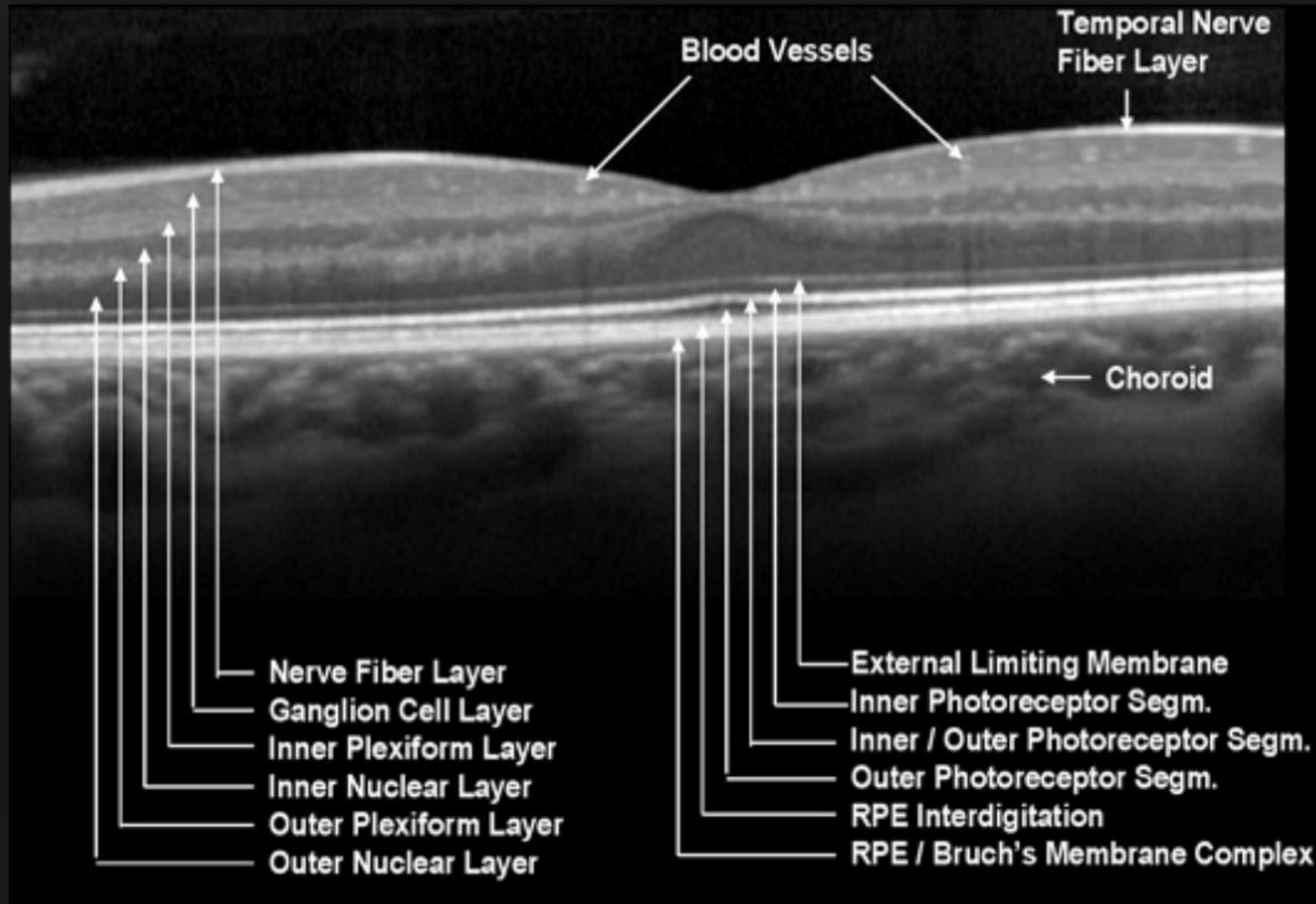
- Meet op 3,4 mm van centrum van de oogzenuw

Waarom?

- Beste compromis tussen dikte en interindividuele variabiliteit

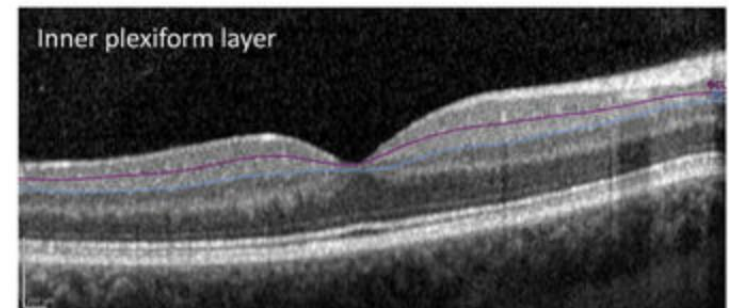
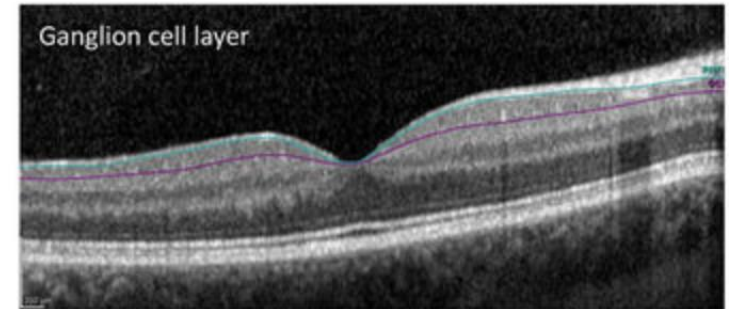
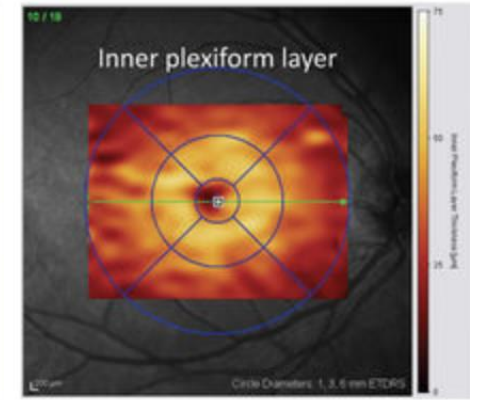
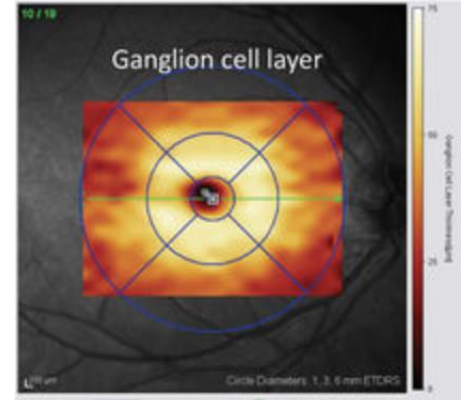
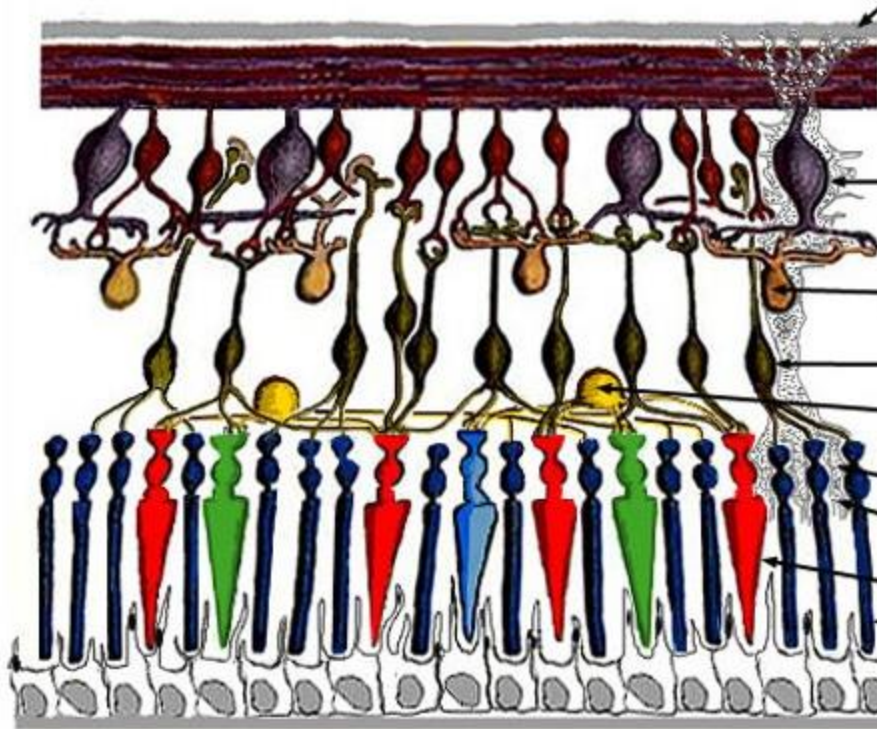
Gevaar...

- Metingen op 3,4 mm afstand kunnen eerste tekenen ziekte missen!!



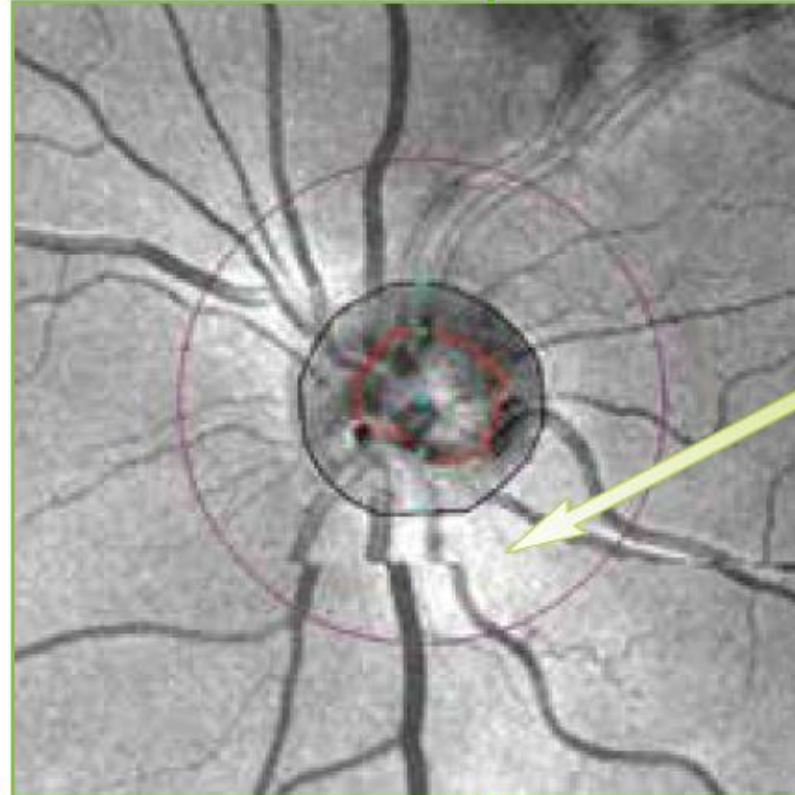
Ganglioncellaag

- 30% van de dikte van retina in macula



Fouten die kunnen optreden bij het maken

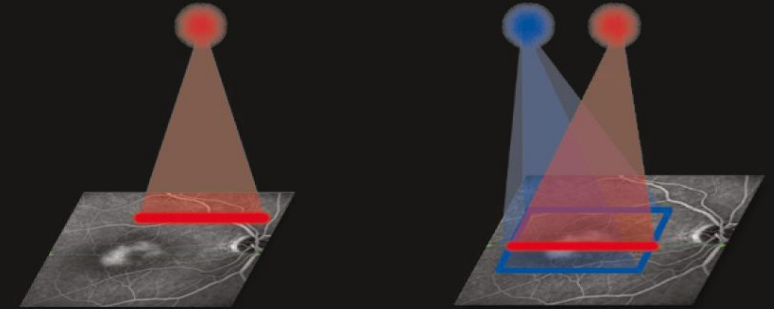
- Tgv oogbewegingen
- Tgv hoofdpositie
- Tgv troebelingen



eyetracking

"This technology is the only one of its kind that merges these two state-of-the-art diagnostic modalities. The precise, pixel-to-pixel alignment of the cSLO and SD-OCT images is an exciting feature."

Frank G. Holz, MD

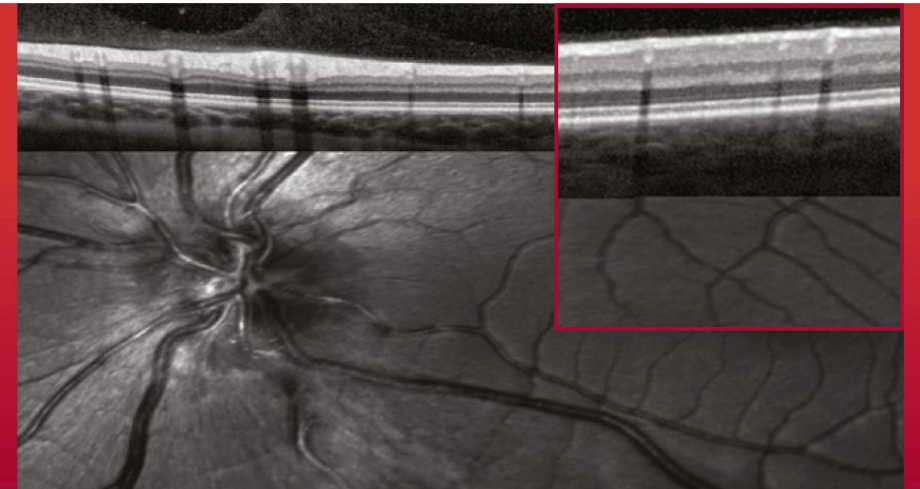


IMAGING WITHOUT ACTIVE EYE TRACKING
Eye Moves — Beam Is Fixed

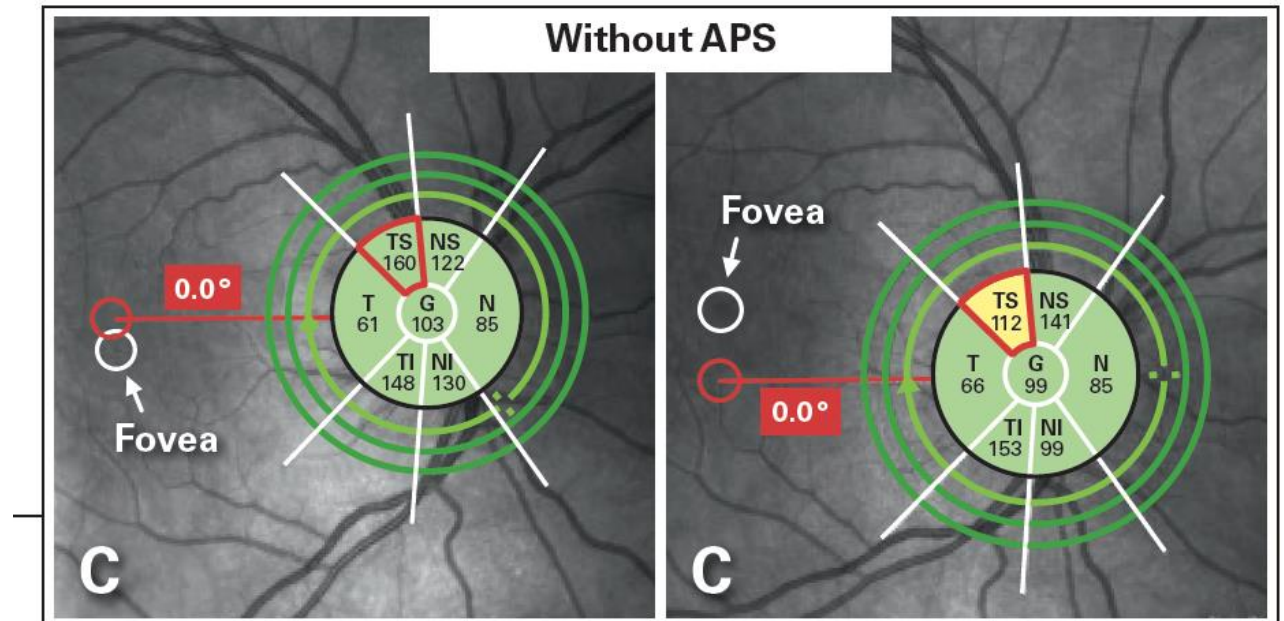
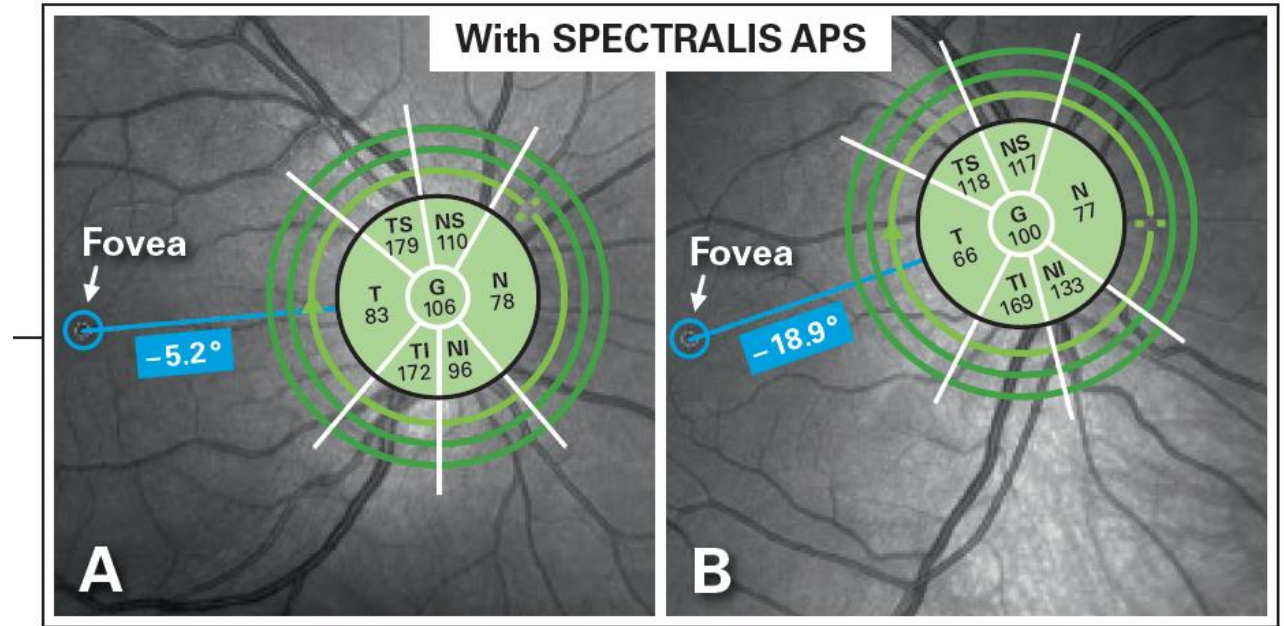
TRUTRACK™ ACTIVE EYE TRACKING
Eye Moves — Beams Track

"Volume scanning is the real power of SD-OCT. Since very few patients can keep their eyes still during a volume scan, active eye tracking is essential to get accurate SD-OCT scans."

Alexander Walsh, MD



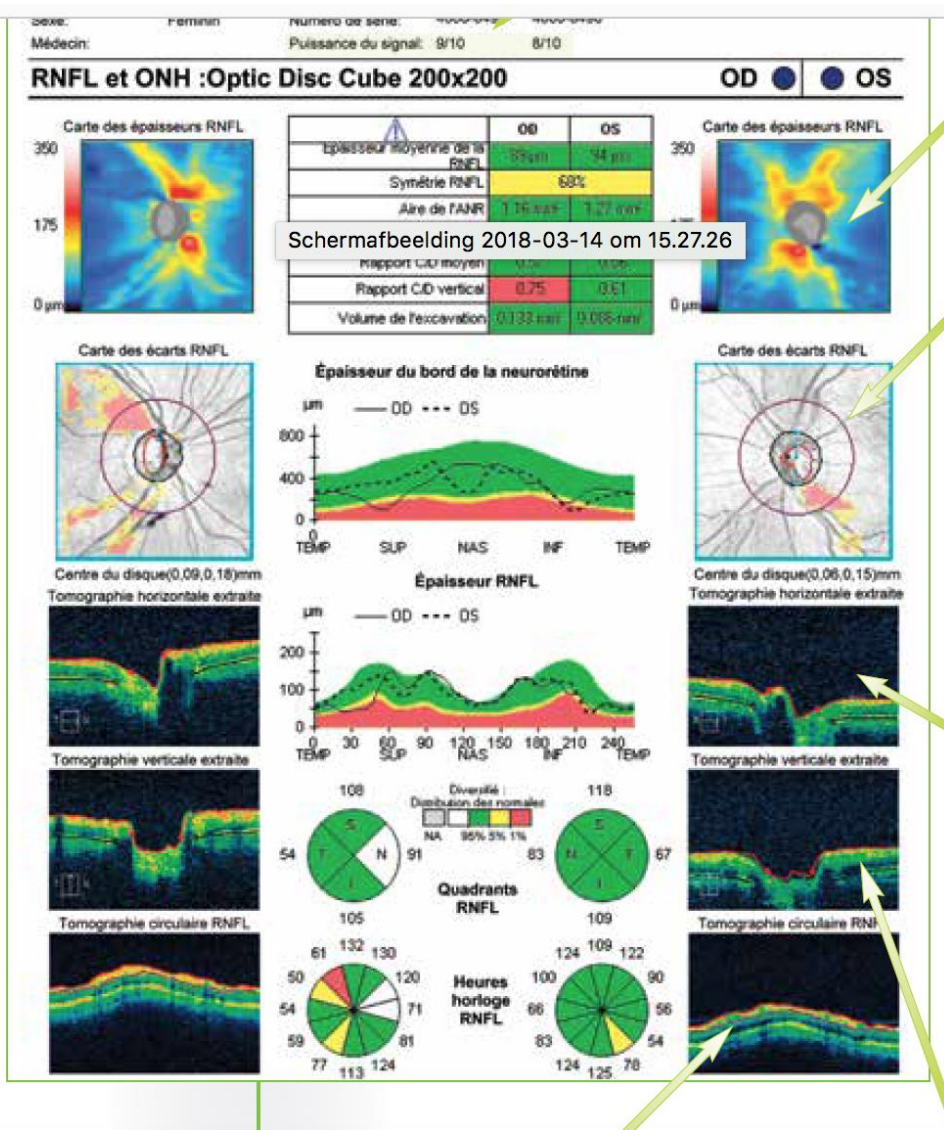
Hoofdpositie



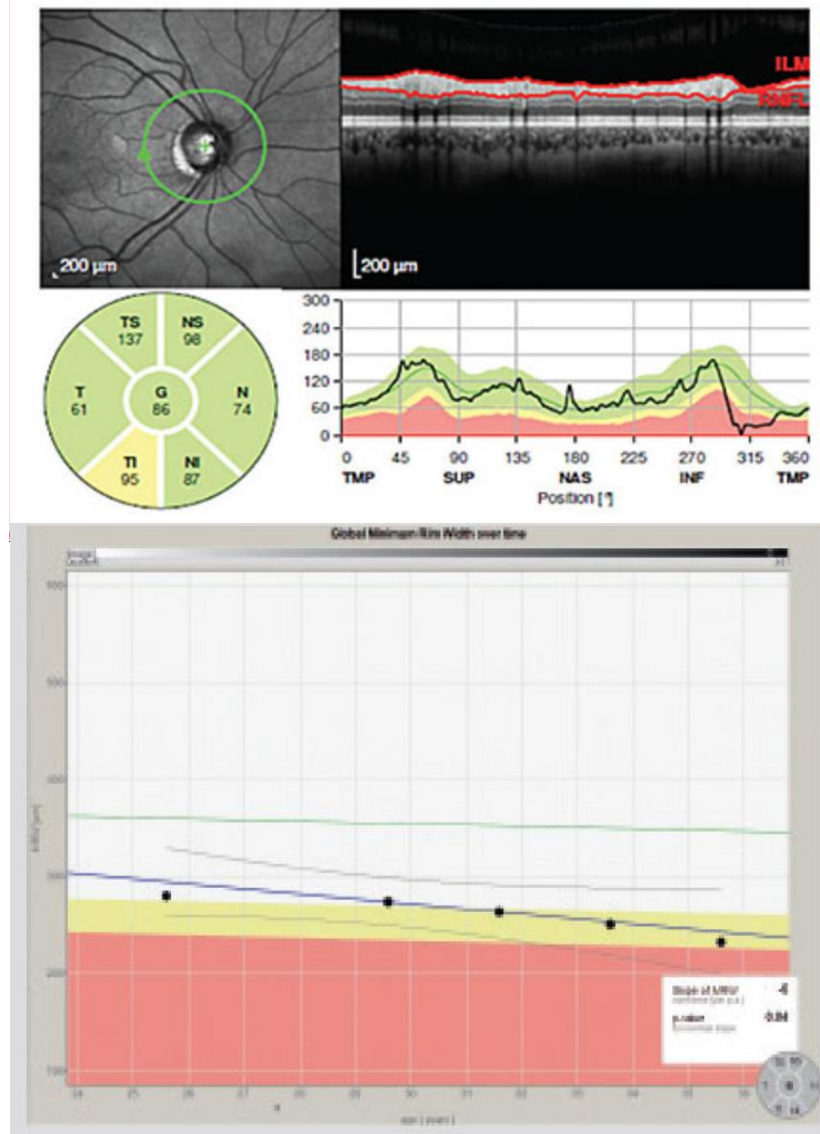
Fouten in de interpretatie

- Foutief groen
ZVL op 3,4 mm vanaf papil,
tractie, oedeem etc
- Foutief rood
tgv head-tilt, oogbewegingen
PPA , myopen/ hypermetropen
- Database
Cirrus: n= 284
Lft: 18-84
- 12 tot + 8.0 D

Cirrus



Heidelberg



OS: zenuwvezel laag en gezichtsveld

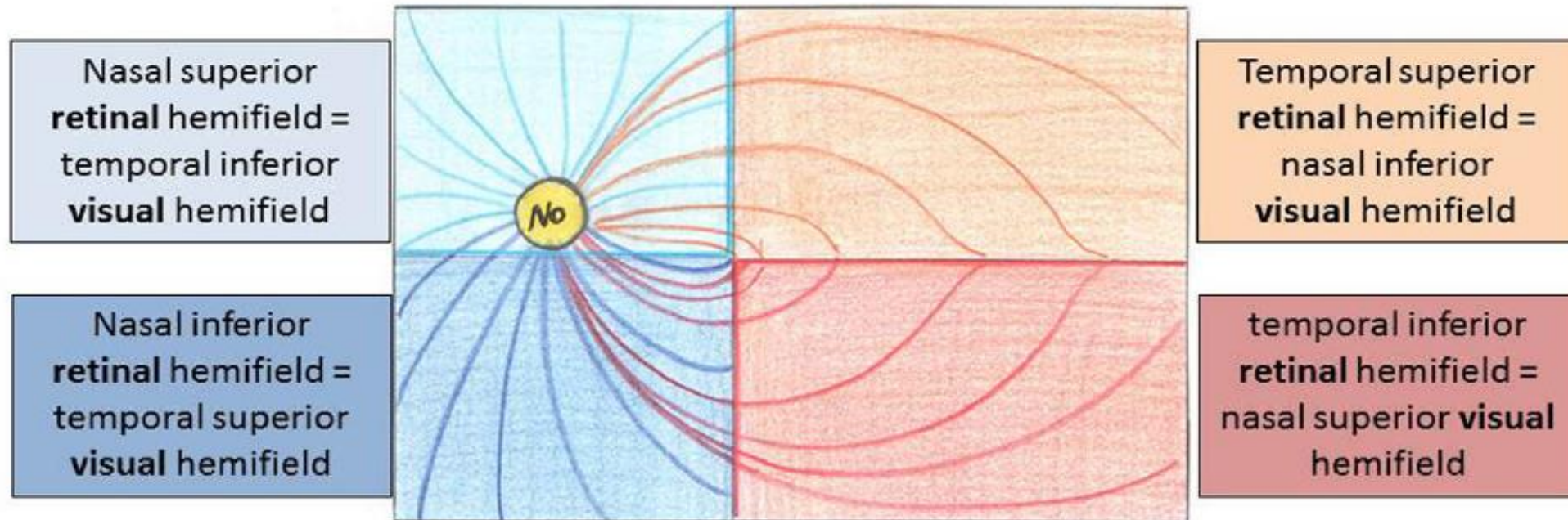
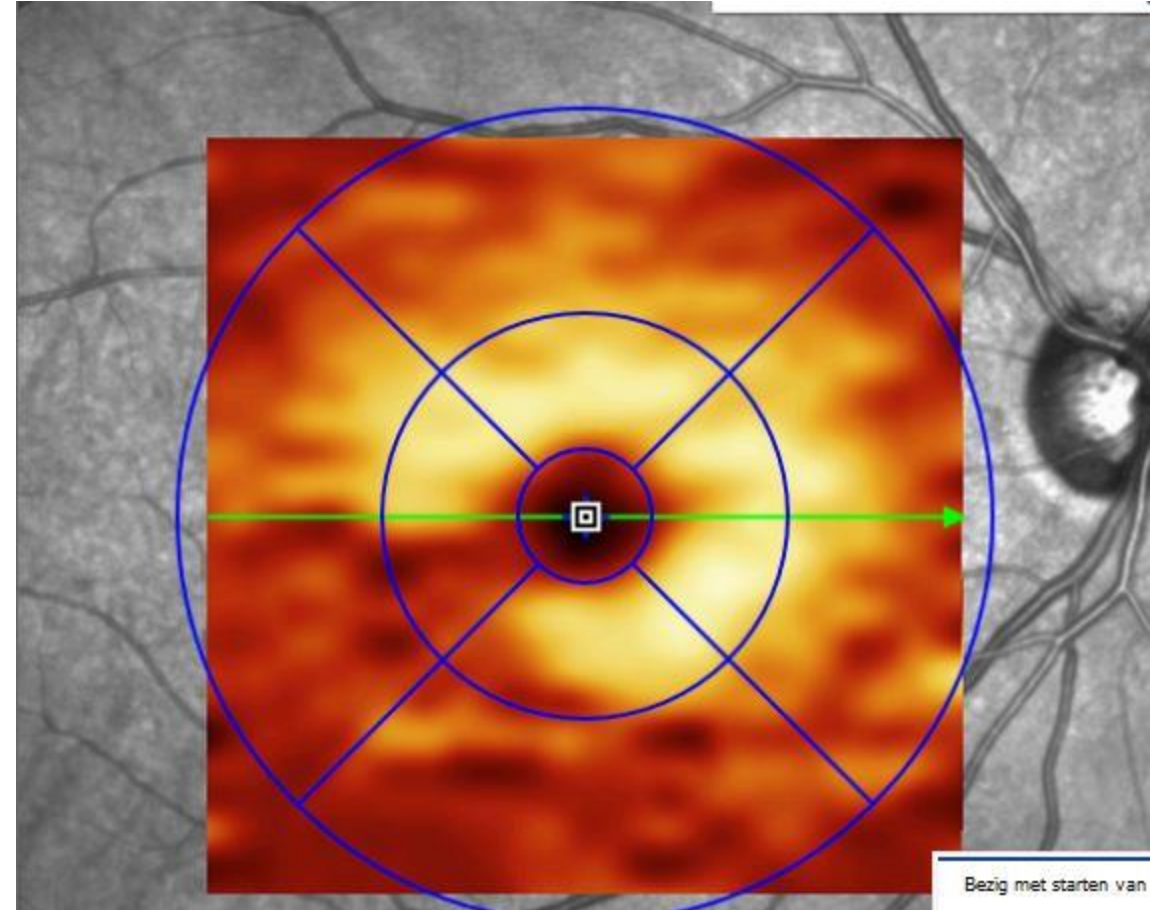
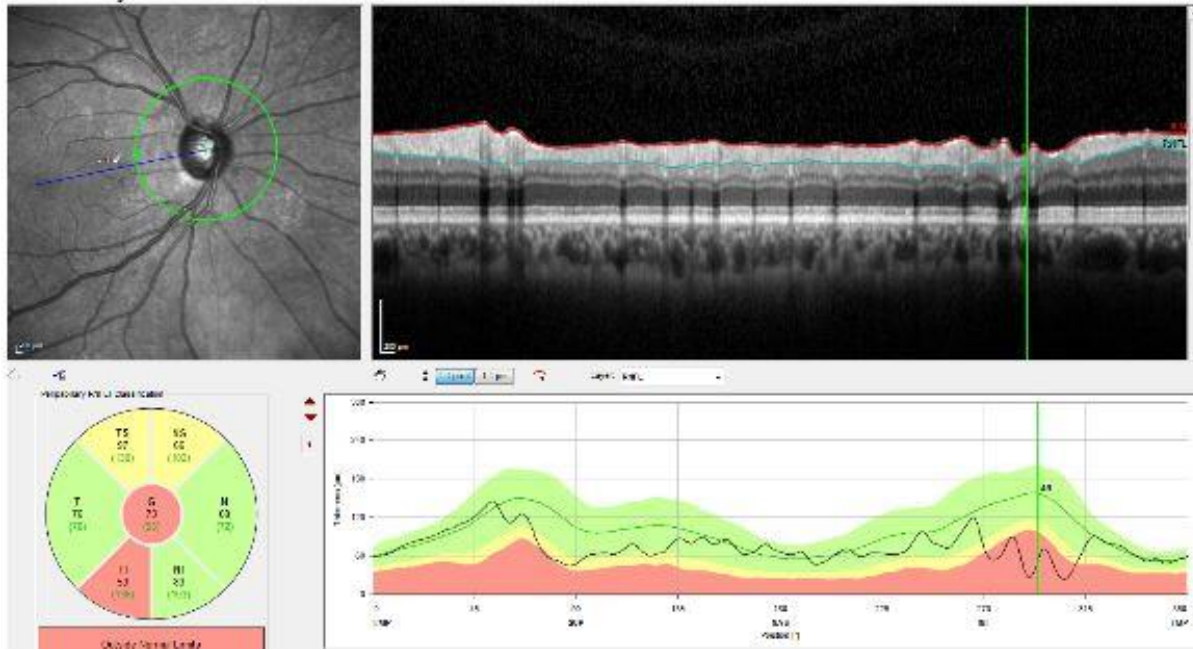


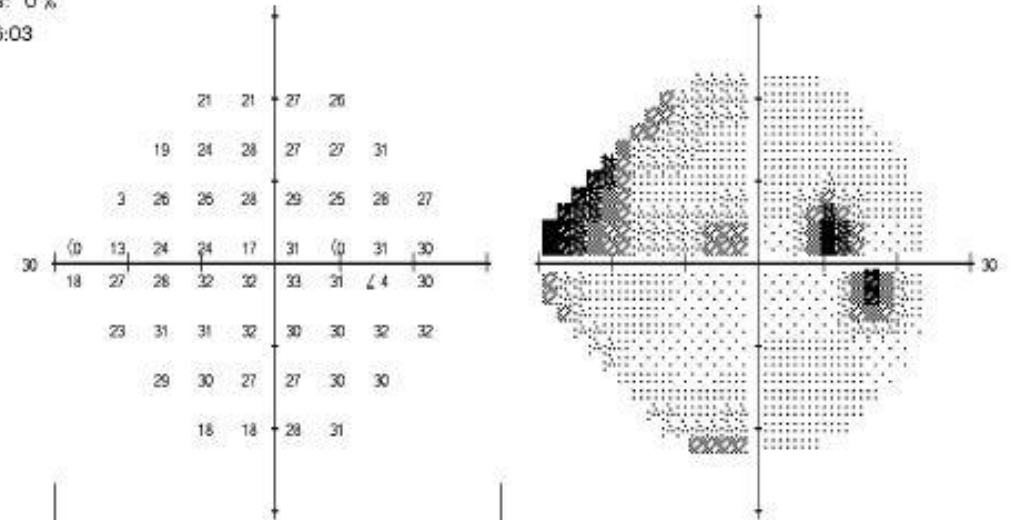
Fig. 1. Retinal organization of ganglion-cell fibers from retinal origin to optic nerve head (left eye, fundus view). ON: optic nerve.

Glaucoom casus



Bijpassend GVO

False POS Errors: 0 %
 False NEG Errors: 0 %
 Test Duration: 06:03
 Fovea: 37 dB



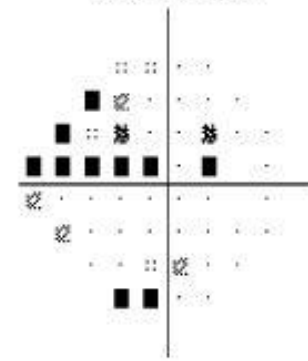
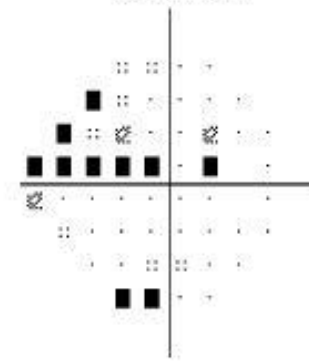
		-4	-5	1	1				
		-9	-4	-1	-2	-1	4		
		-25	-3	-4	-2	-1	-5	-1	0
		-28	-16	-7	-7	-15	0	-33	1
		-8	-1	-2	1	0	1	0	1
		-5	0	0	0	-1	0	2	3
		0	0	-3	-4	0	1		
		-10	-11	-1	2				

Total Deviation

				-5	-6	0	0				
				-10	-5	-1	-2	-1	3		
				-26	-4	-5	-3	-2	-6	-1	-1
				-29	-17	-8	-8	-15	-1	-33	0
				-9	-2	-3	0	-1	0	-1	0
				-6	0	-1	-1	-2	-1	1	2
				-1	-1	-4	-5	-1	0		
				-11	-12	-2	1				

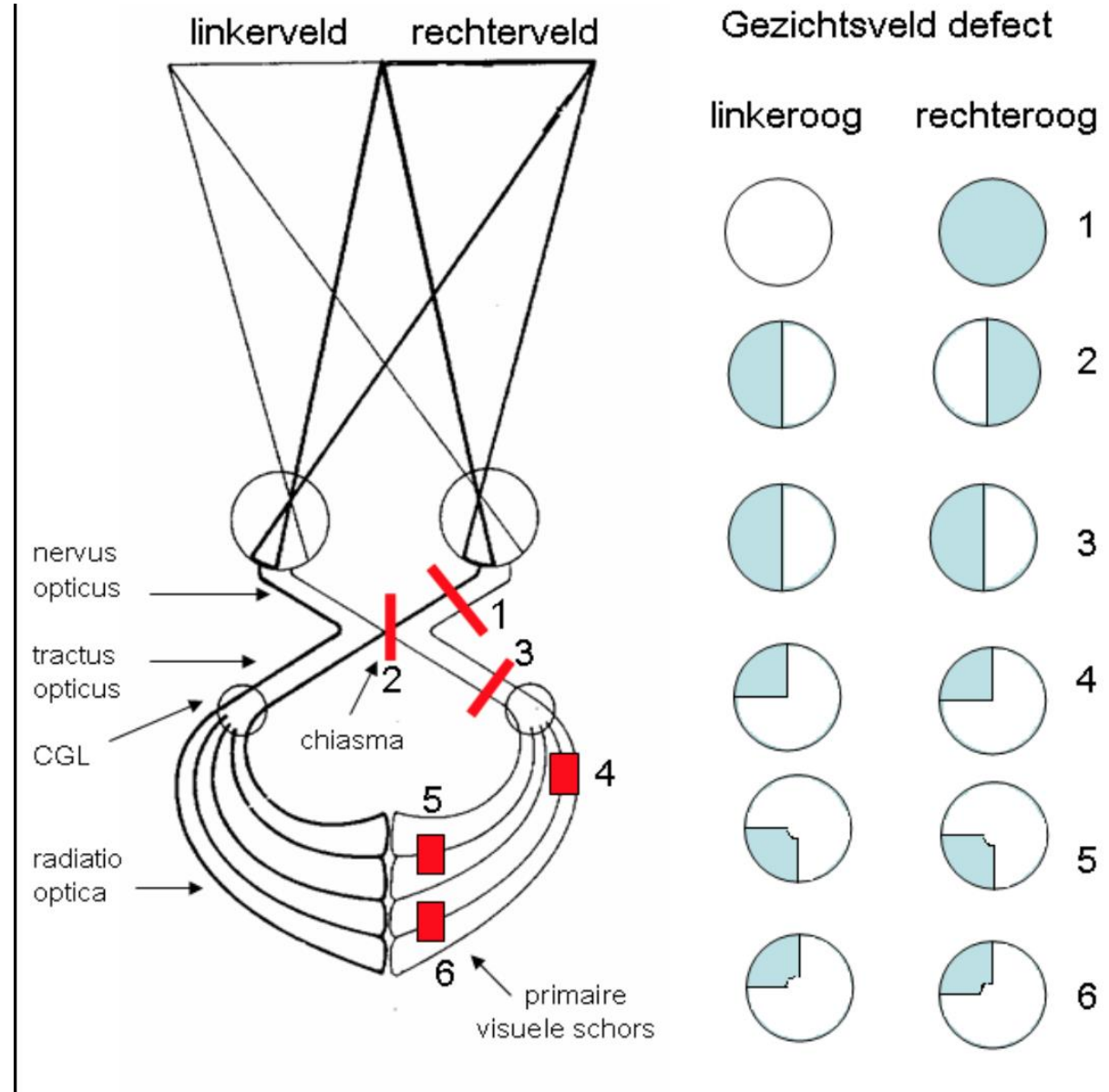
Pattern Deviation

GHT
 Outside Normal Limits
 VFI 88%
 MD -3.60 dB P < 1%
 PSD 7.49 dB P < 0.5%

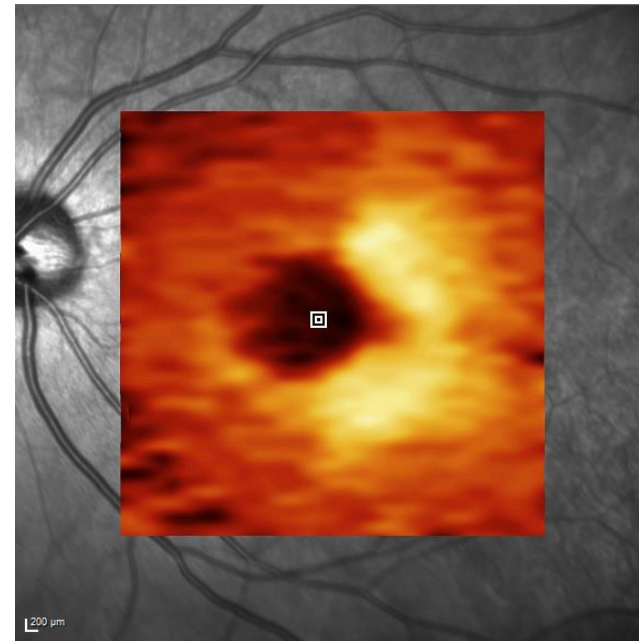
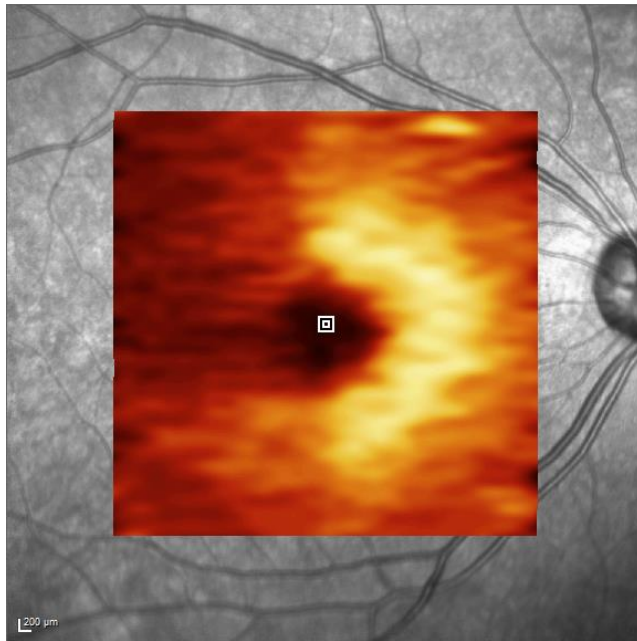


∴ < 5%
 ∴ < 2%
 ∴ < 1%
 ■ < 0.5%

opfrisser



OCT bij neurologische afwijkingen



Hemibeeld links passend bij schade rechts post chiasmaal tgv drain traject rechts?

Verslag

Kliniek:

In 2004 hersenletsel na trauma. Hemibeeld links. Nu lichte toename klachten. Vasculaire afwijking, atrofie?

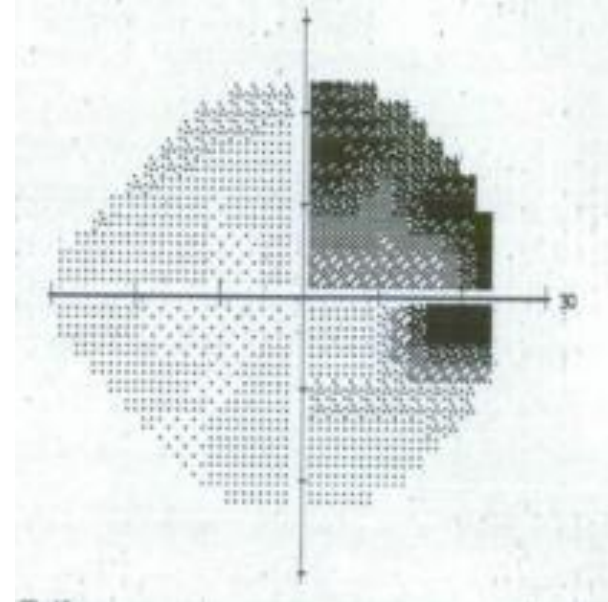
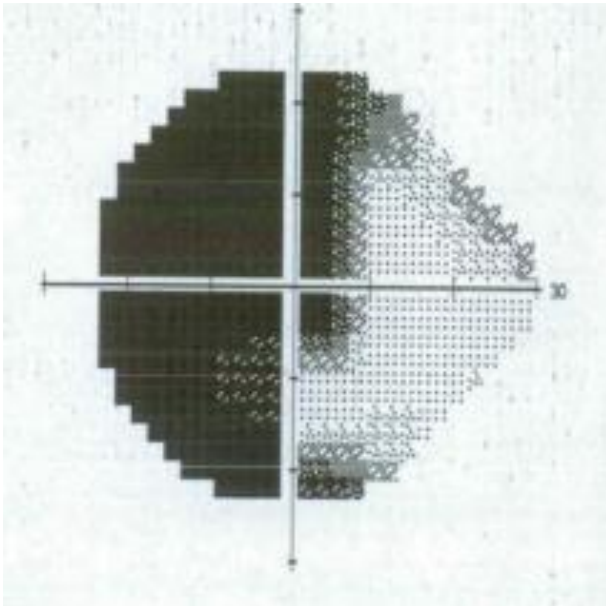
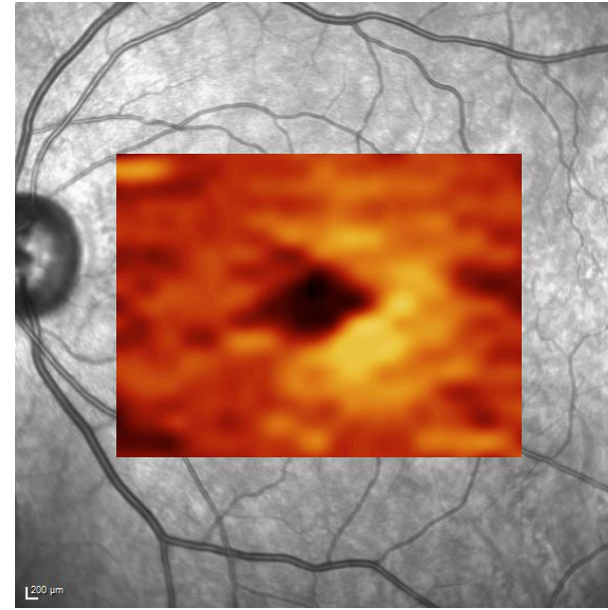
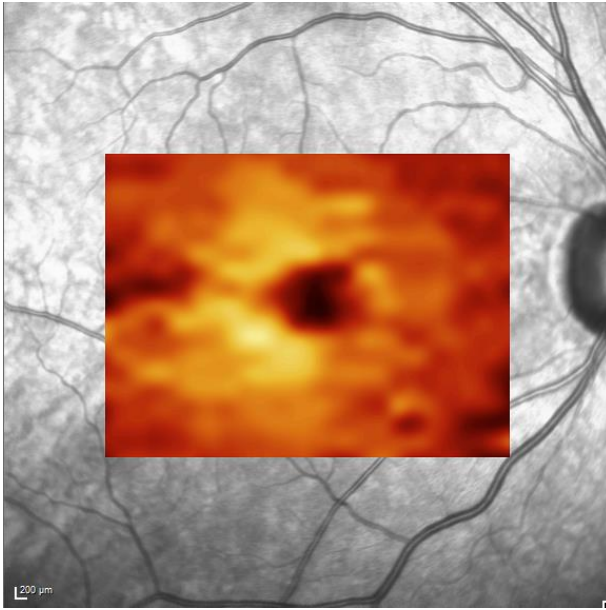
MRI cerebrum:

MRI cerebrum volgens protocol. Onderzoek 2004 thans niet beschikbaar voor vergelijk. Wel het verslag hiervan. Symmetrisch niet gedilateerd aspect van ventrikelsysteem. Normaal aspect van extracerebrale liquorroimten. Lineair gebied van witte stofafwijking doorlopend tot aanconvexiteit rechts d.d. draintraject. Drain in situ geweest? Voorts kleine focale witte stofafwijking periventriculair rechts ter plaatse van de achterhoorn op IMA 13 en op IMA 14. elders geen focale afwijkingen. Er is minimale asymmetrie op het niveau van de pons ten nadele van rechts op IMA 9 en op IMA 8 van 24 in het transversale vlak. Evidente focale afwijkingen op dit niveau zijn niet zichtbaar.

Conclusie:

Een enkele witte stofafwijking alsmede waarschijnlijk zichtbaar draintraject. Opname 2004 zullen worden opgevraagd ter vergelijk. Hiernanog separate verslaglegging.

Casus 2



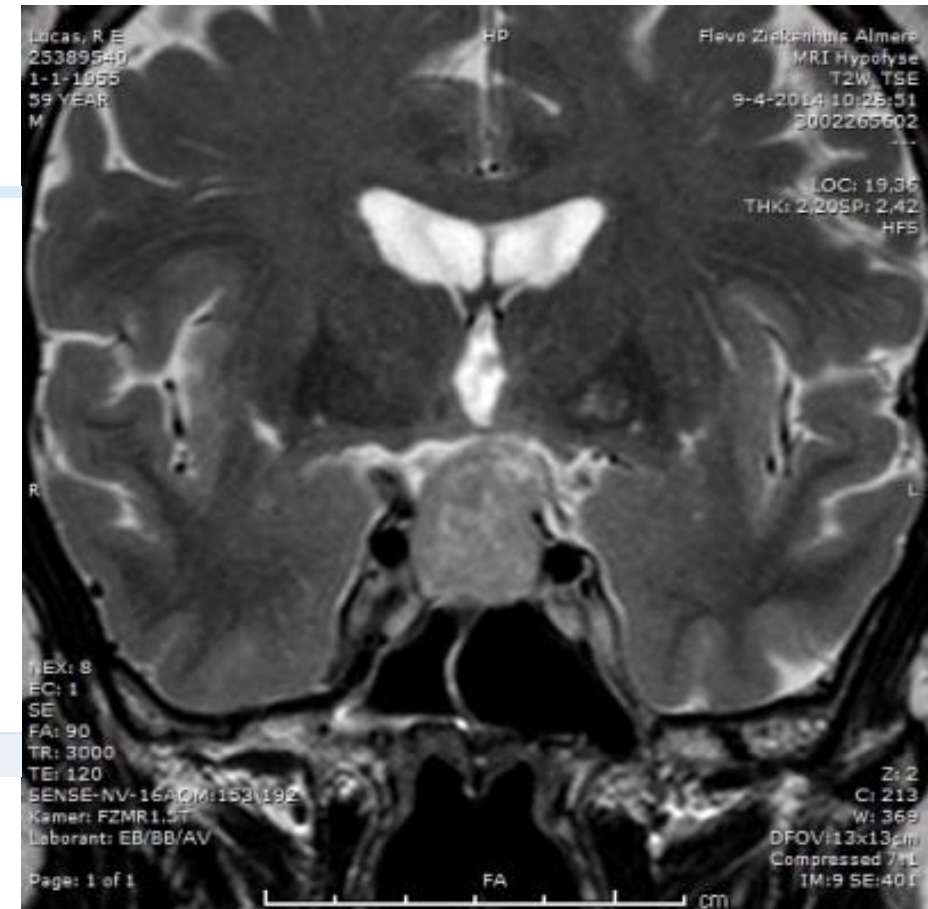
Klinisch gegevens:
Hypofyse RIP?

MRI hypofyse:

Gescand volgens protocol zonder en na IV-contrast. Beeld passend bij eengroot hypofysair macroadenoom (2,8 cm) met suprasellaire uitbreiding en compressie chiasma opticum met cystevorming. Licht inhomogene aankleuring en geen dural tail. Geen flow voids.

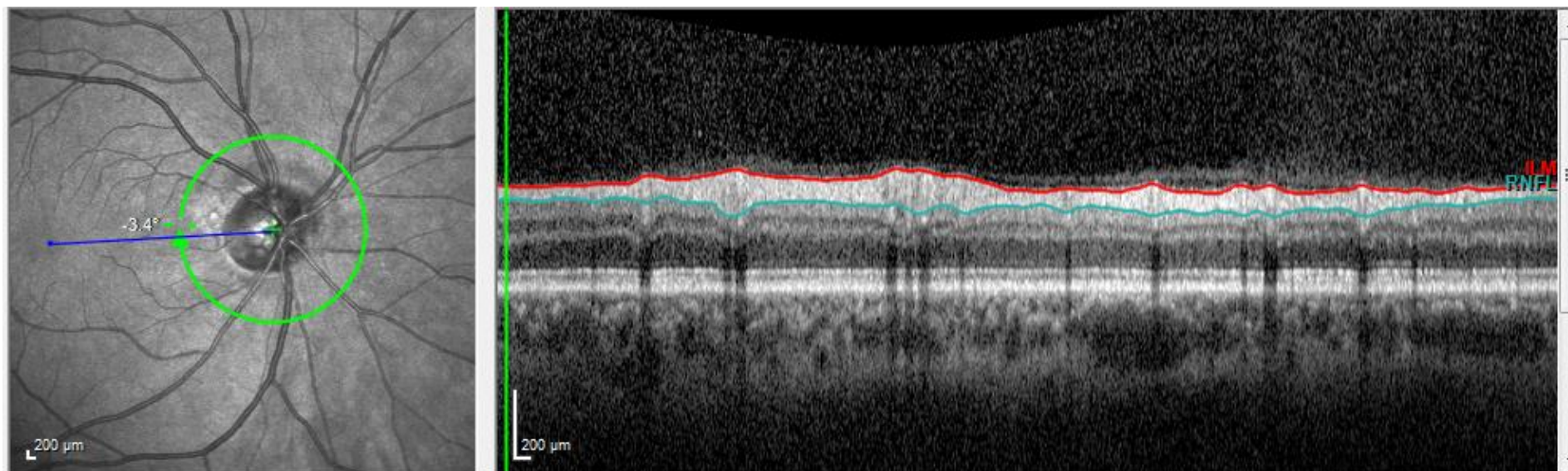
Conclusie:

Hypofysair macroadenoom.



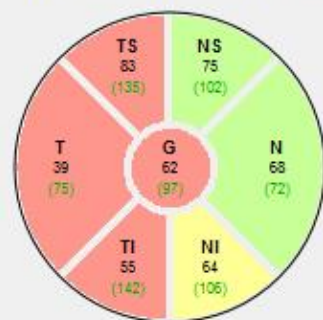
Pte 42 jaar

- Geopereerd aan meningeom rechts frontaal
- Zeer hoge druk intracerebraal gehad

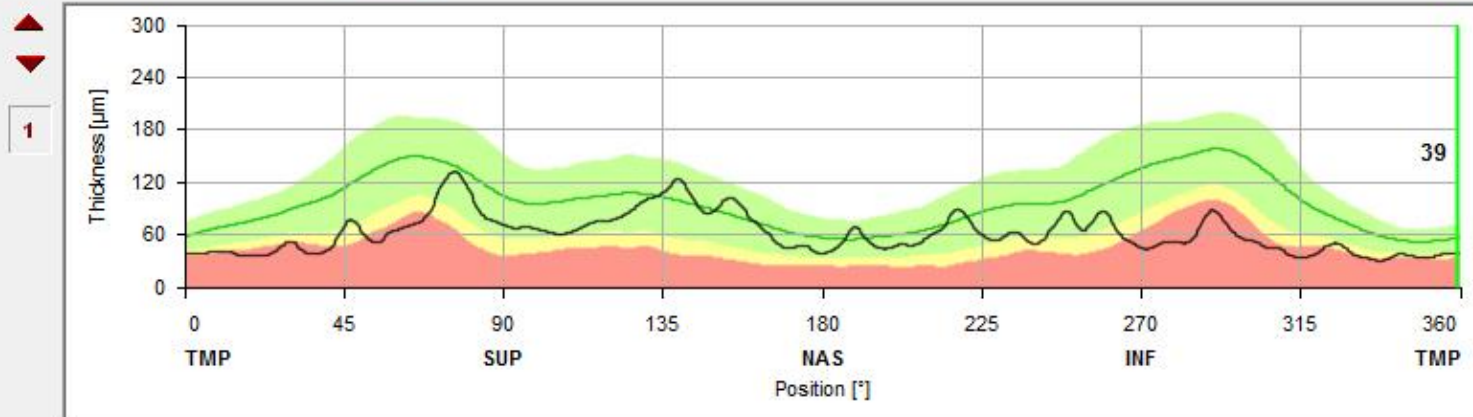


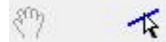
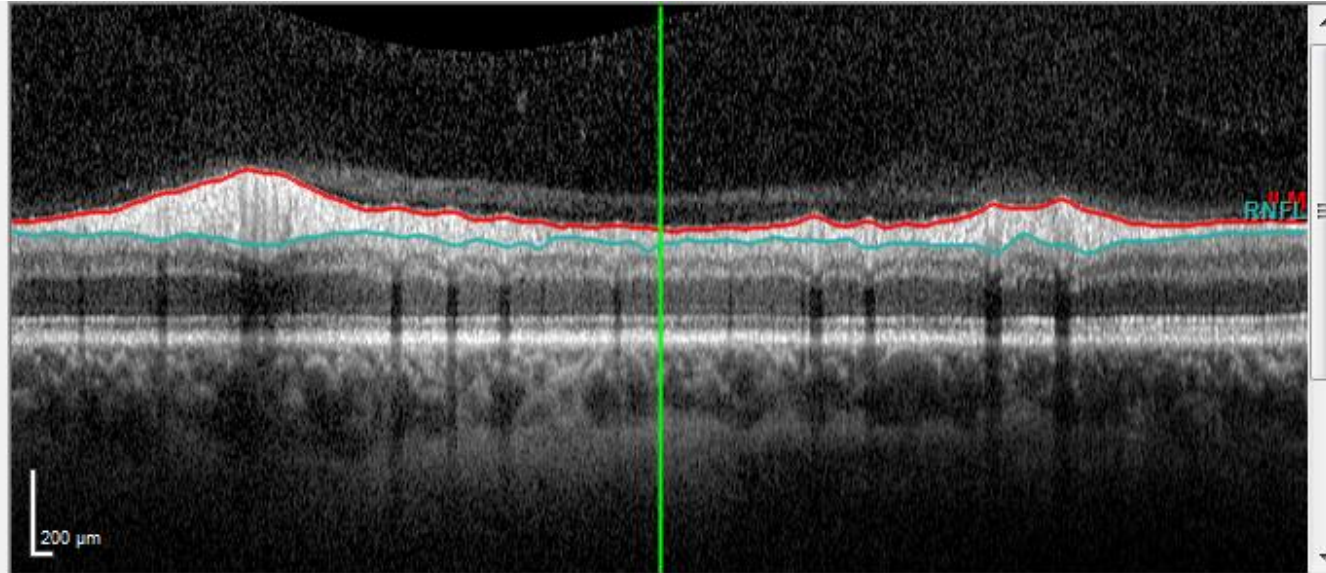
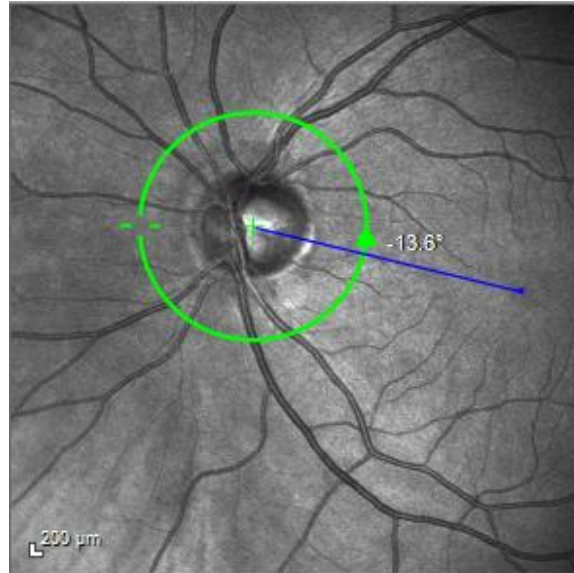
Hand icon Cursor icon Zoom in 1:1 pixel 1:1 μm Zoom out Layer: RNFL

Peripapillary RNFLT Classification



Outside Normal Limits





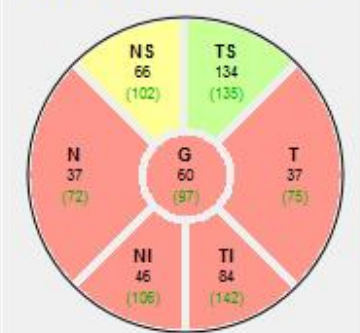
1:1 pixel

1:1 μm



Layer: RNFL

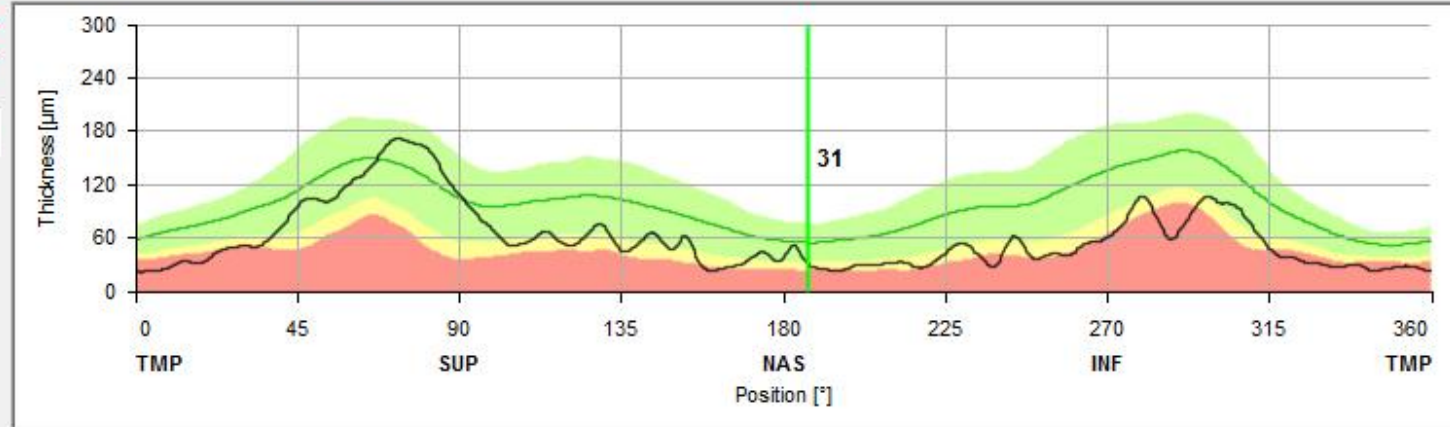
Peripapillary RNFLT Classification

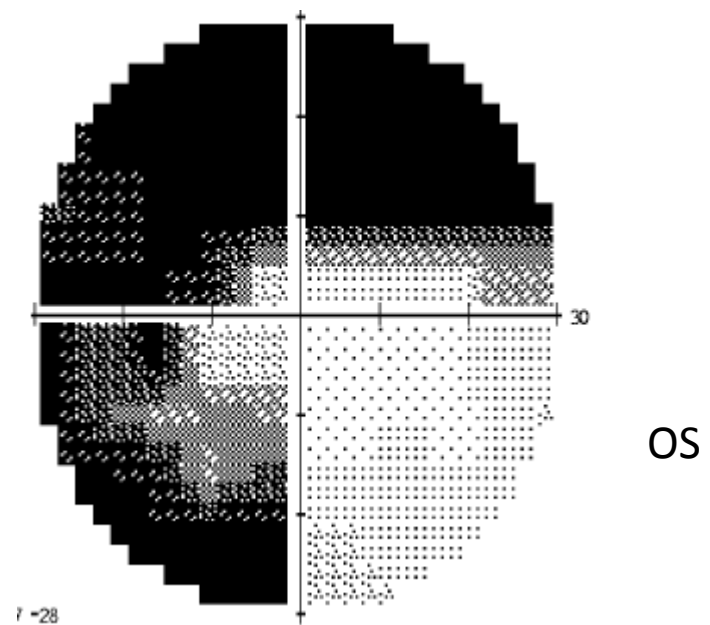
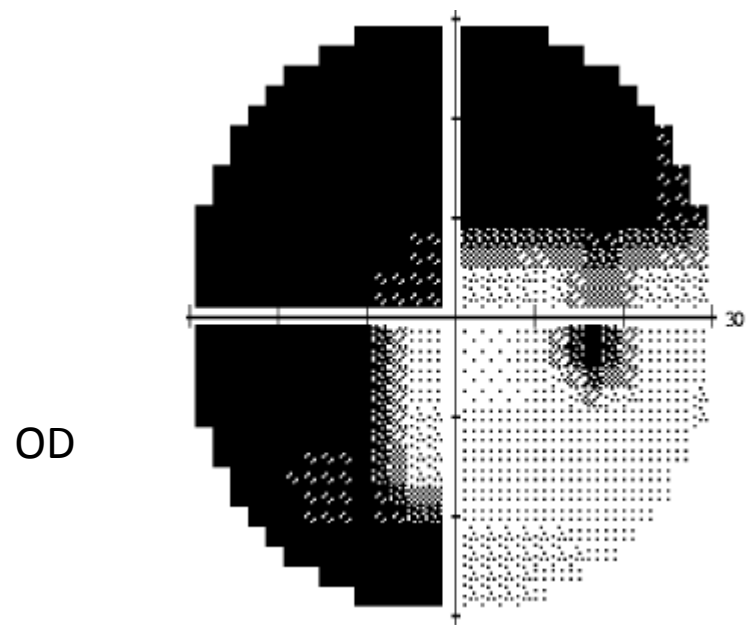
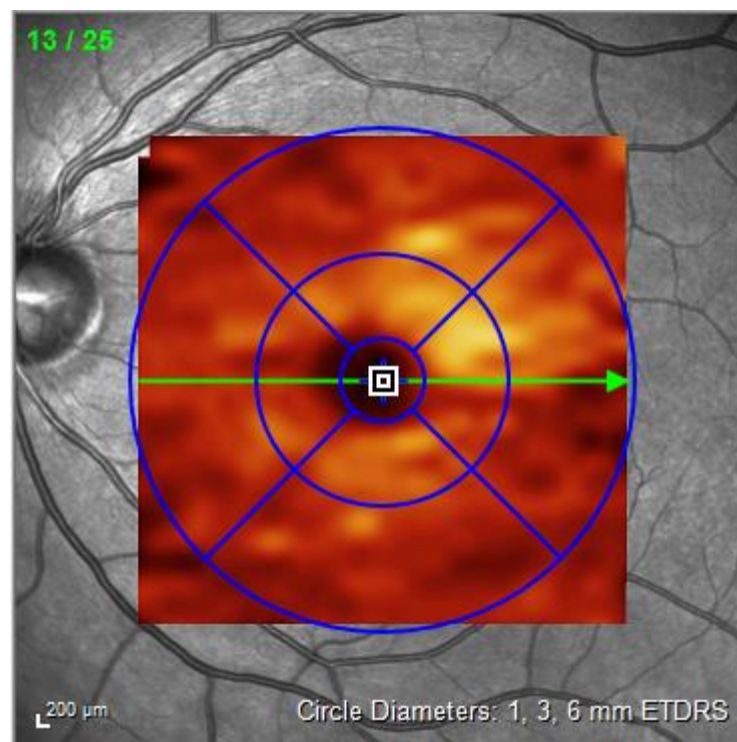
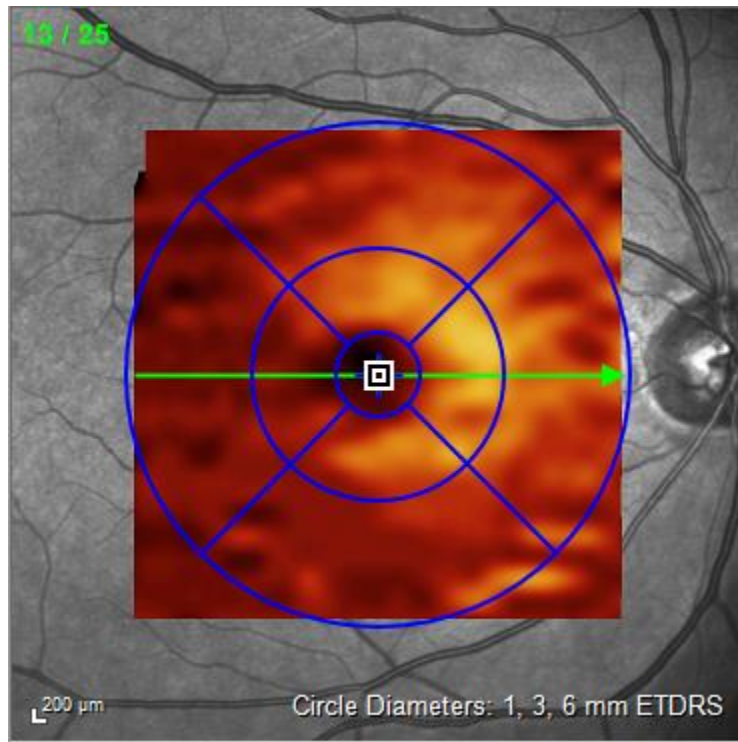


Outside Normal Limits



1





Dank voor jullie aandacht

