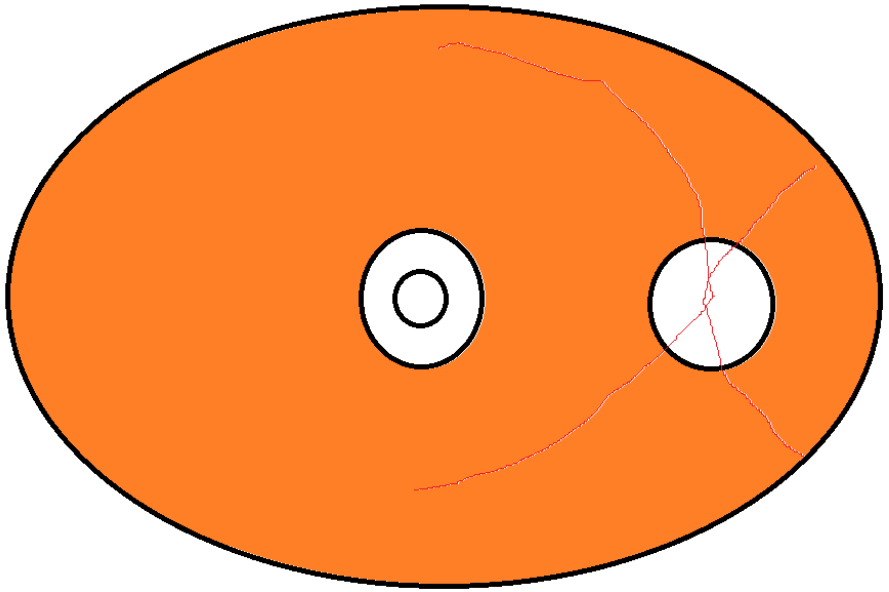
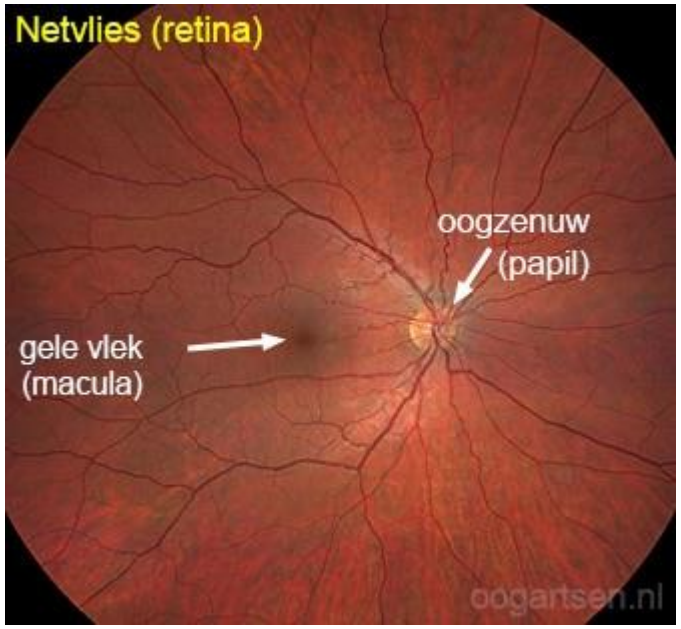
OCT in de neuro-oftalmologie

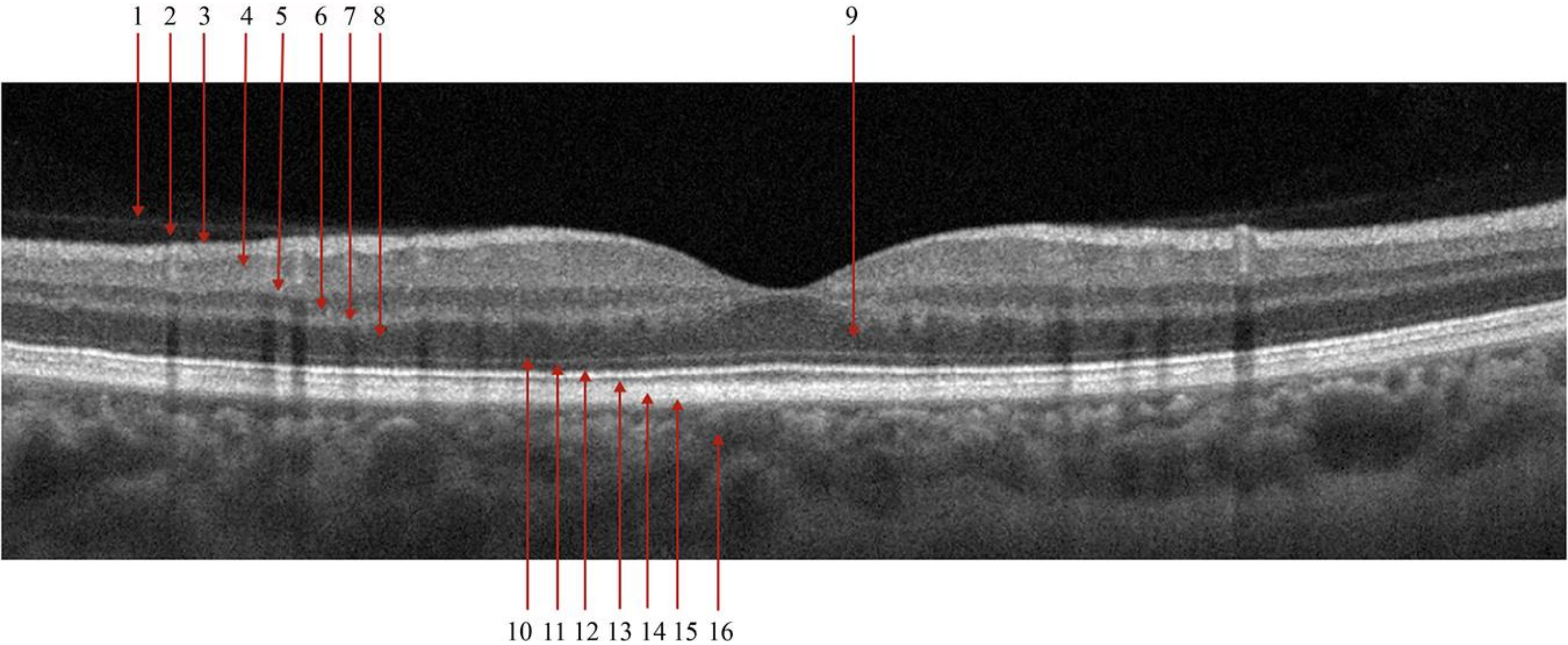
Wilco Perini, neuroloog, AmsterdamUMC

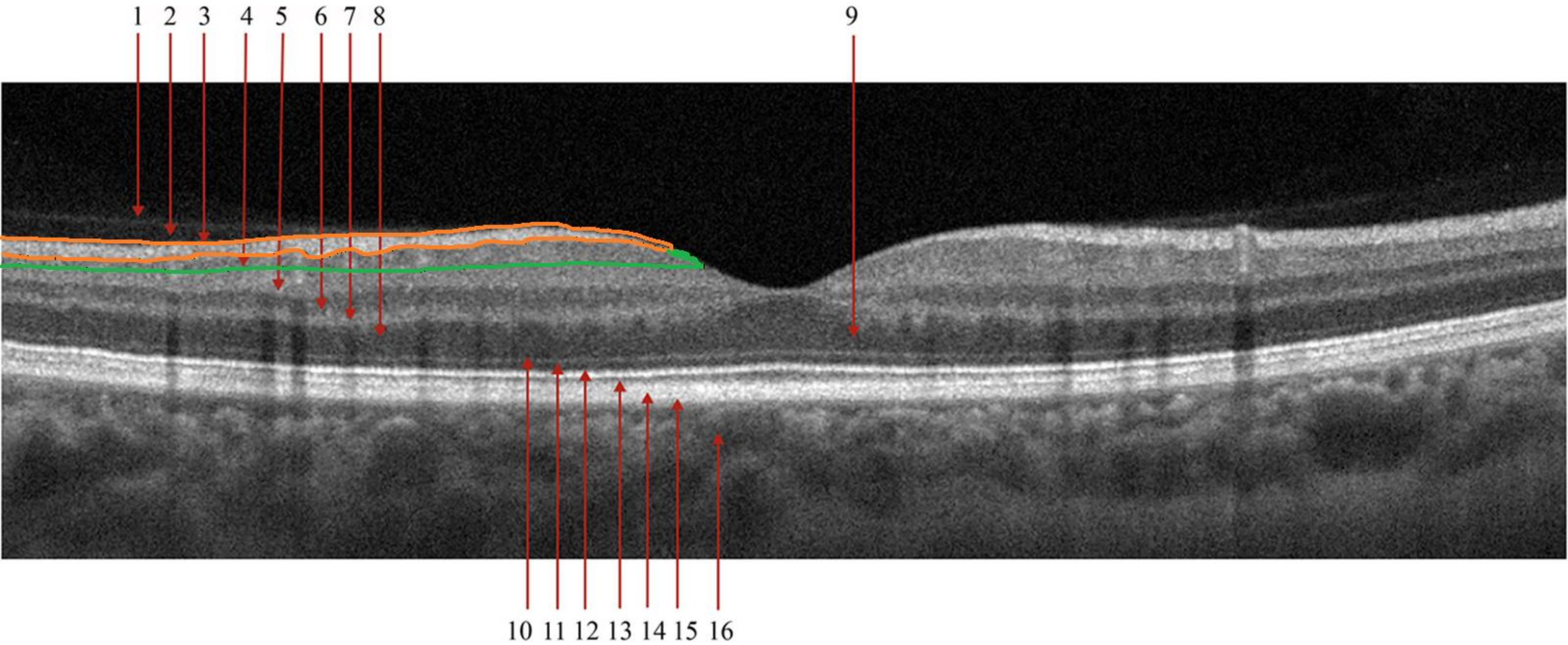
Onderwerpen

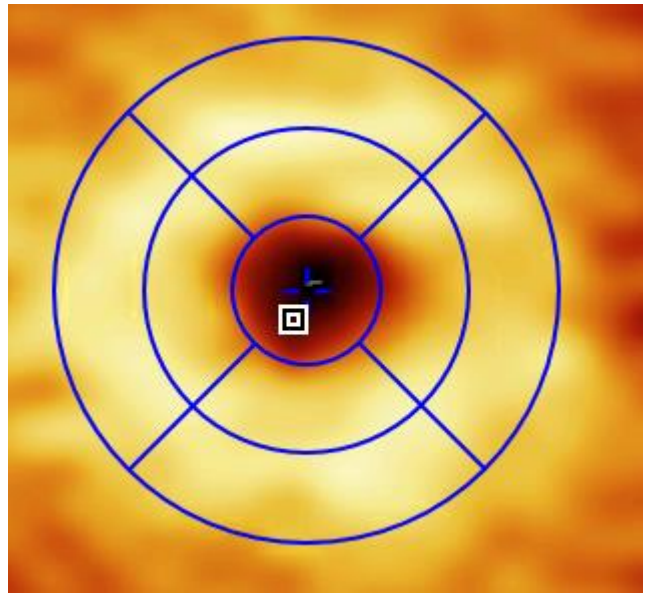
- Opticopathie: etiologische DD
- Papiloedeem versus pseudo-papiloedeem
- A-AION versus N-AION

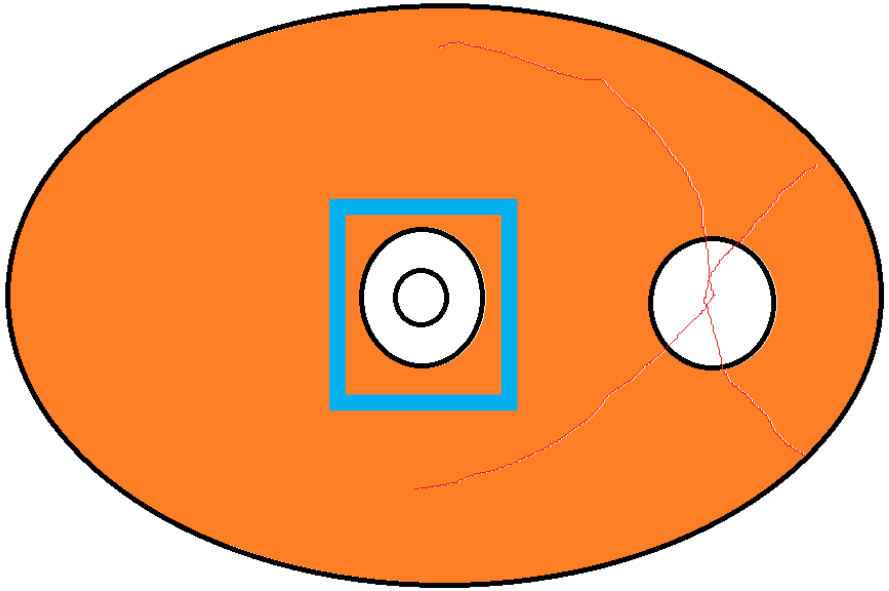


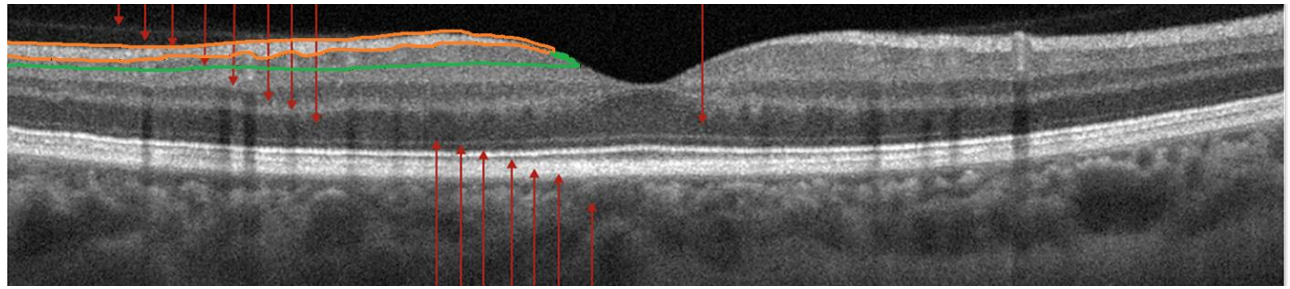

Netvlies (retina)
oogzenuw
(papil)
gele vlek
(macula)
oogartsen.nl

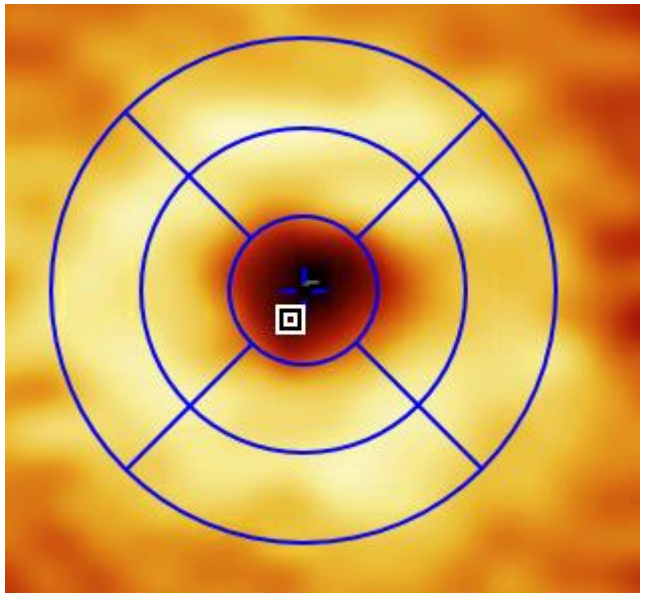

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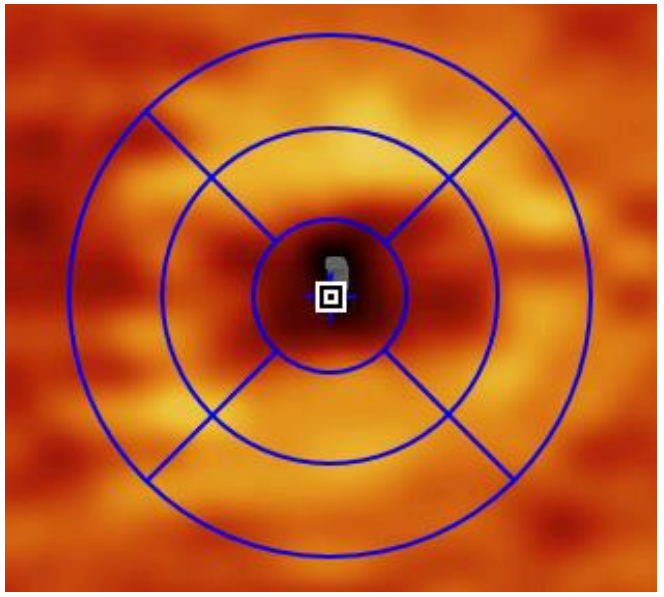

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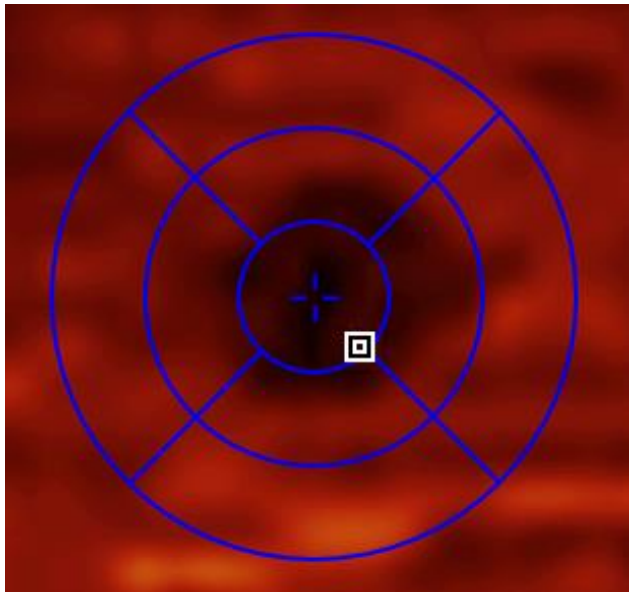


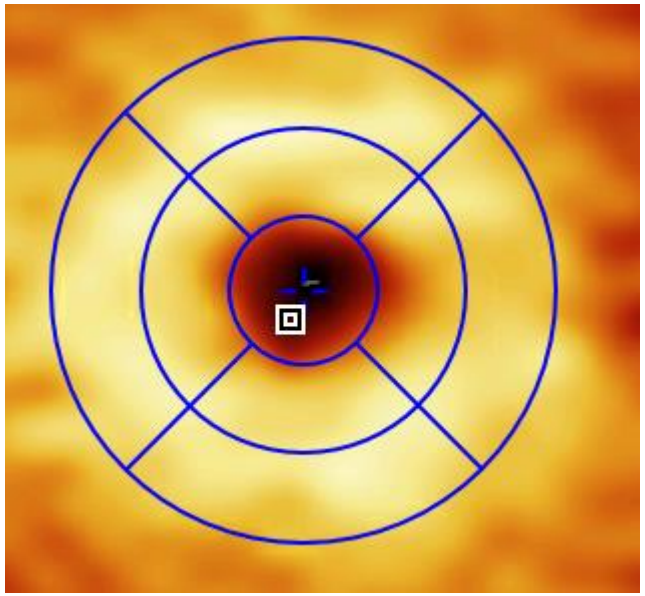


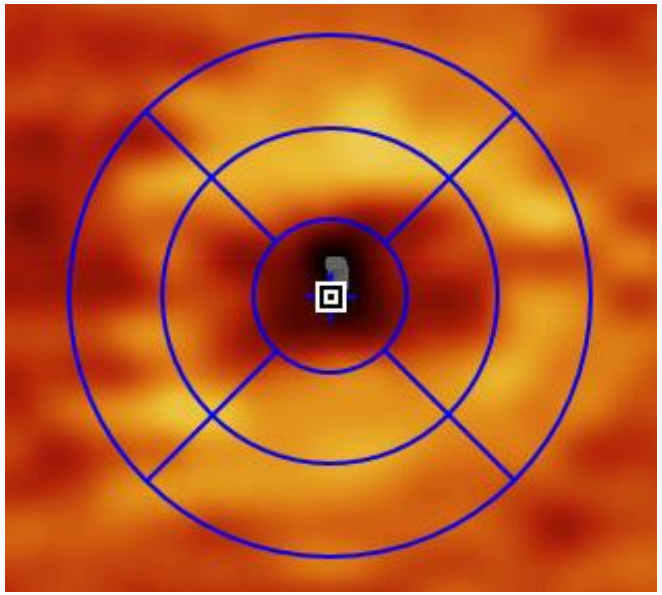


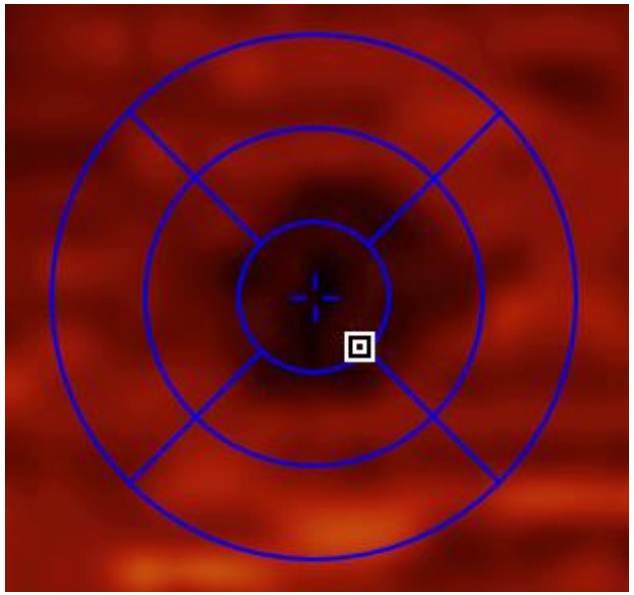


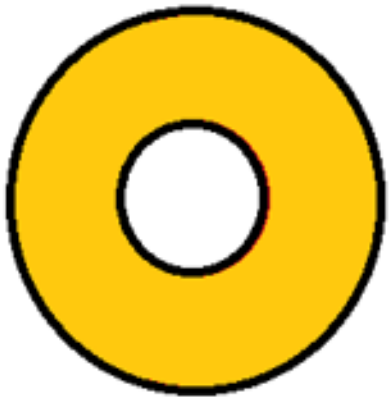






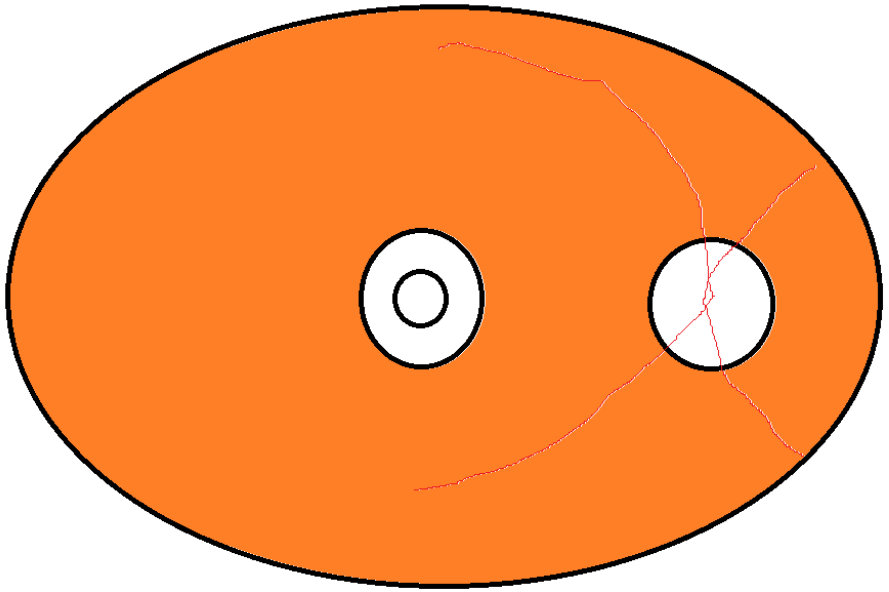


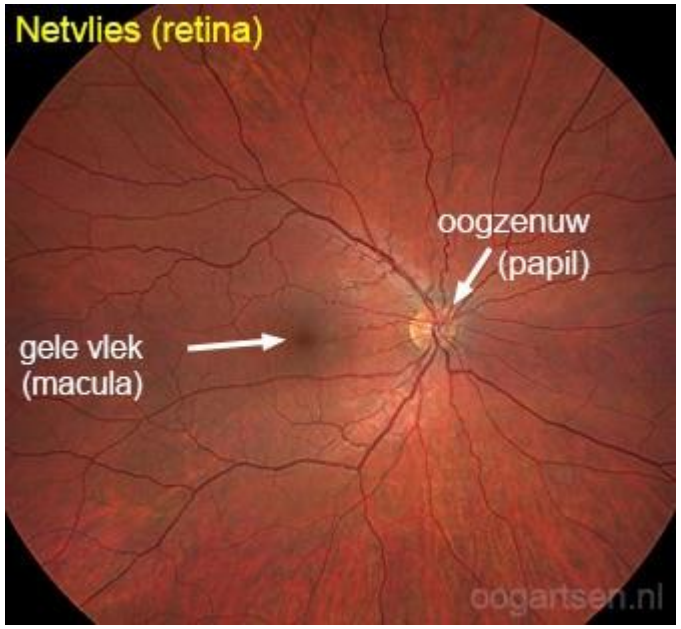


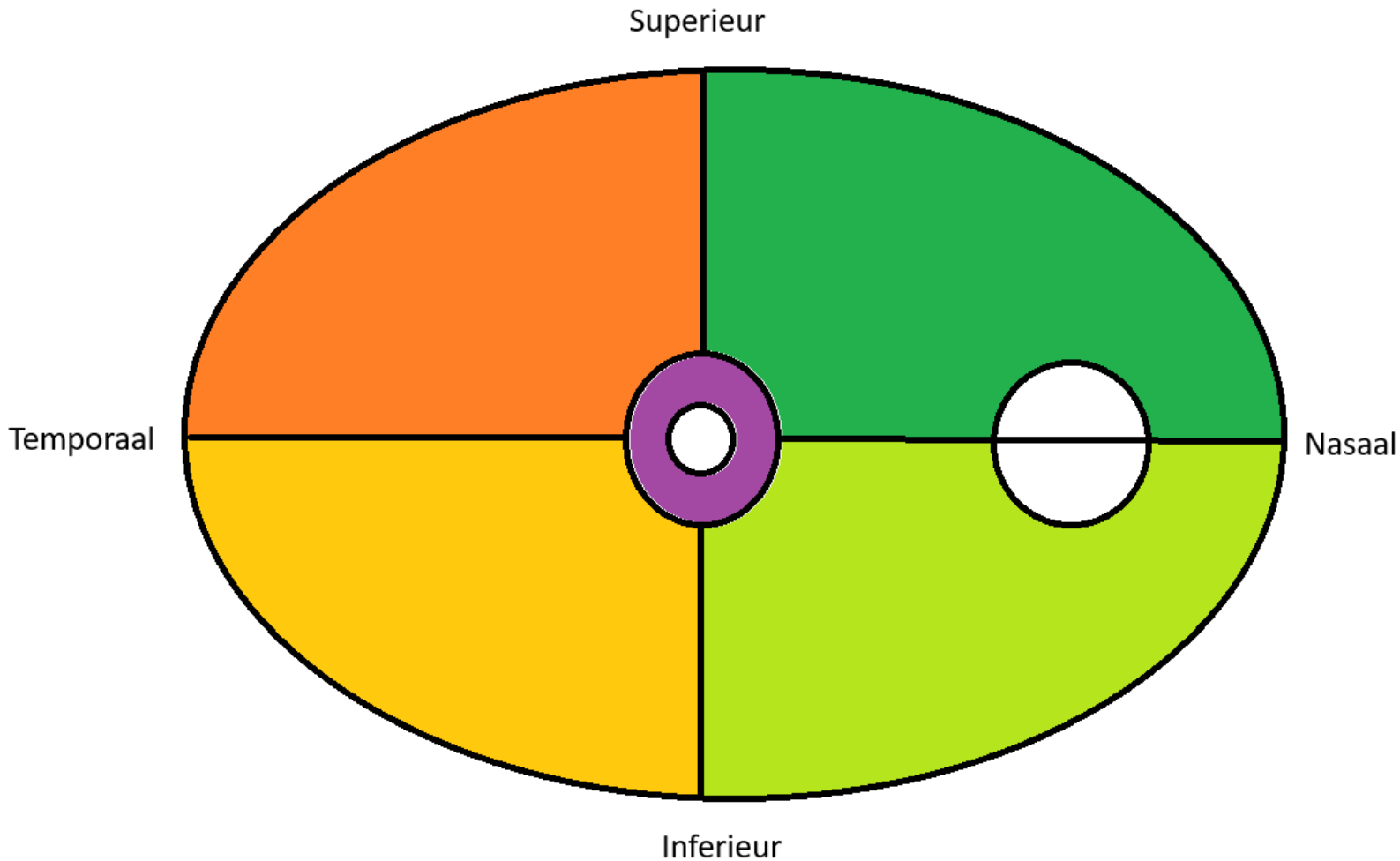




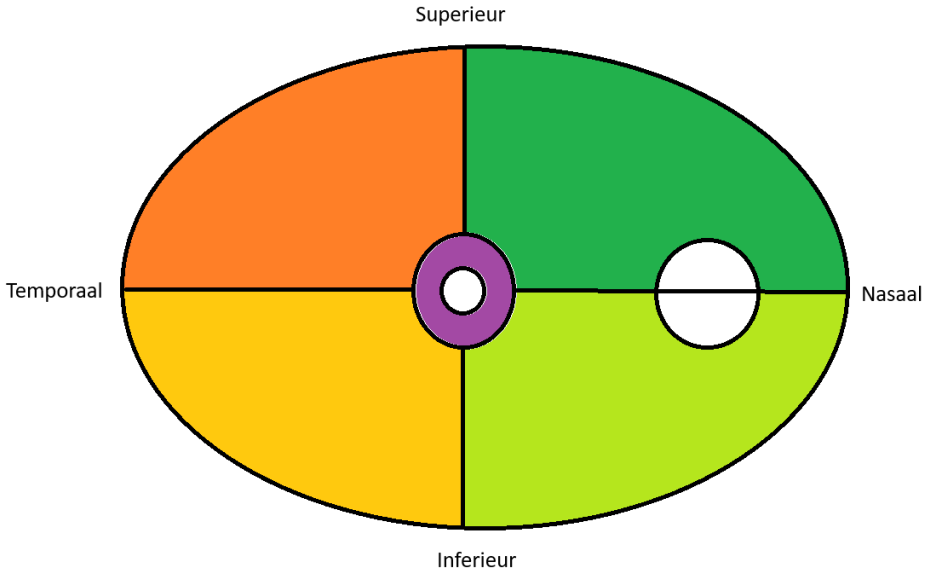




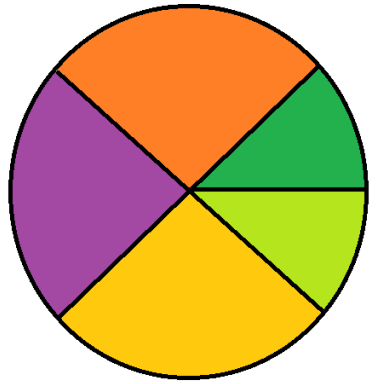

Netvlies (retina)
oogzenuw
(papil)
gele vlek
(macula)
oogartsen.nl


Superieur
Temporaal
Nasaal
Inferieur

Anatomie nervus opticus

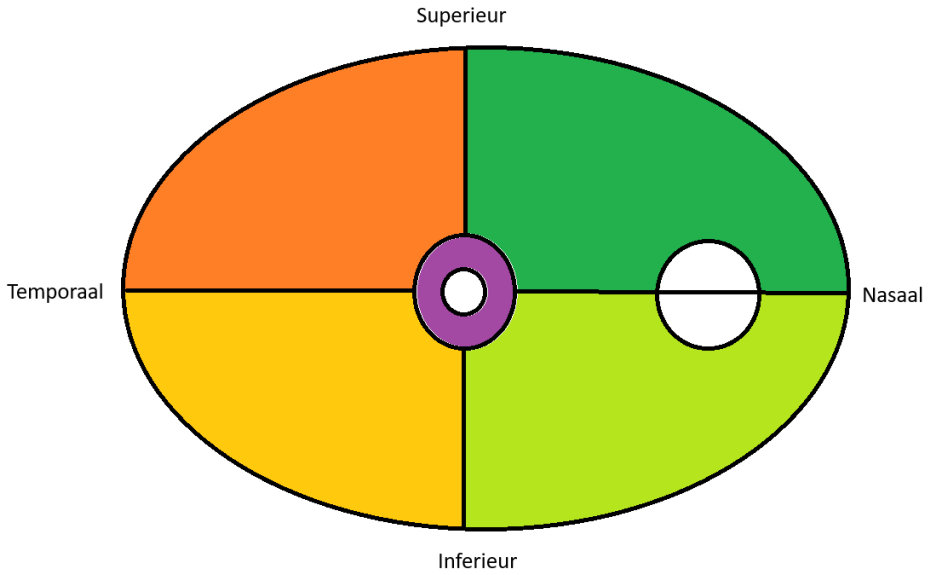


Retina

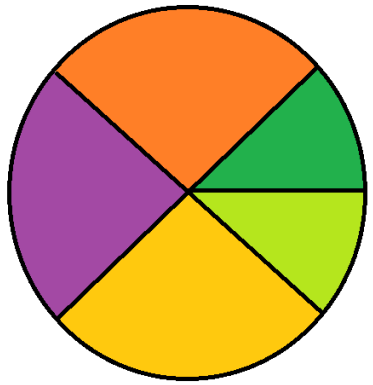


Papil

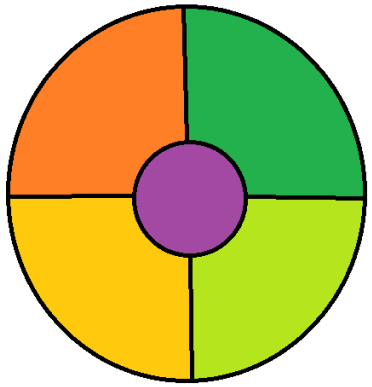
Anatomie nervus opticus



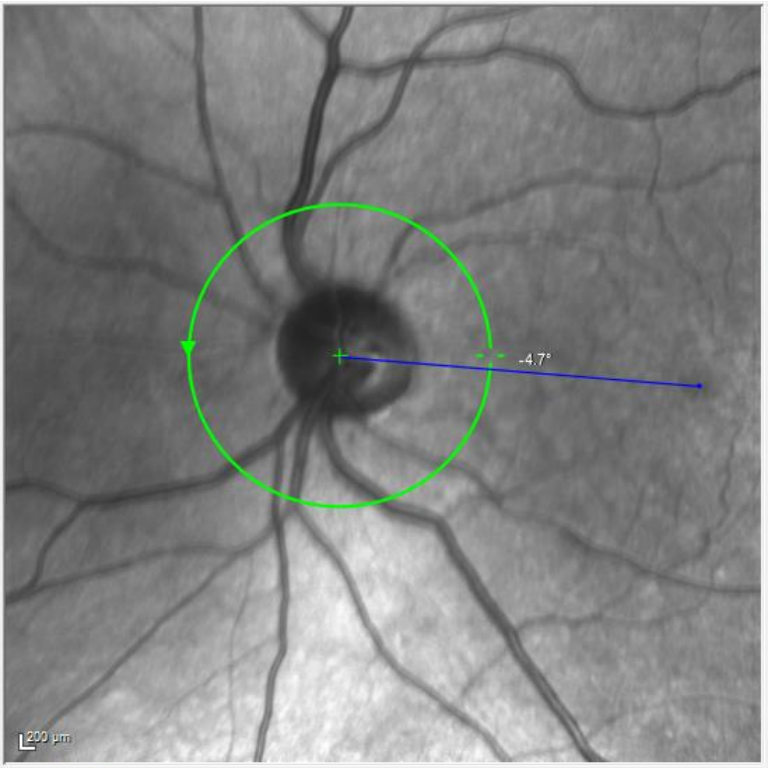
Retina

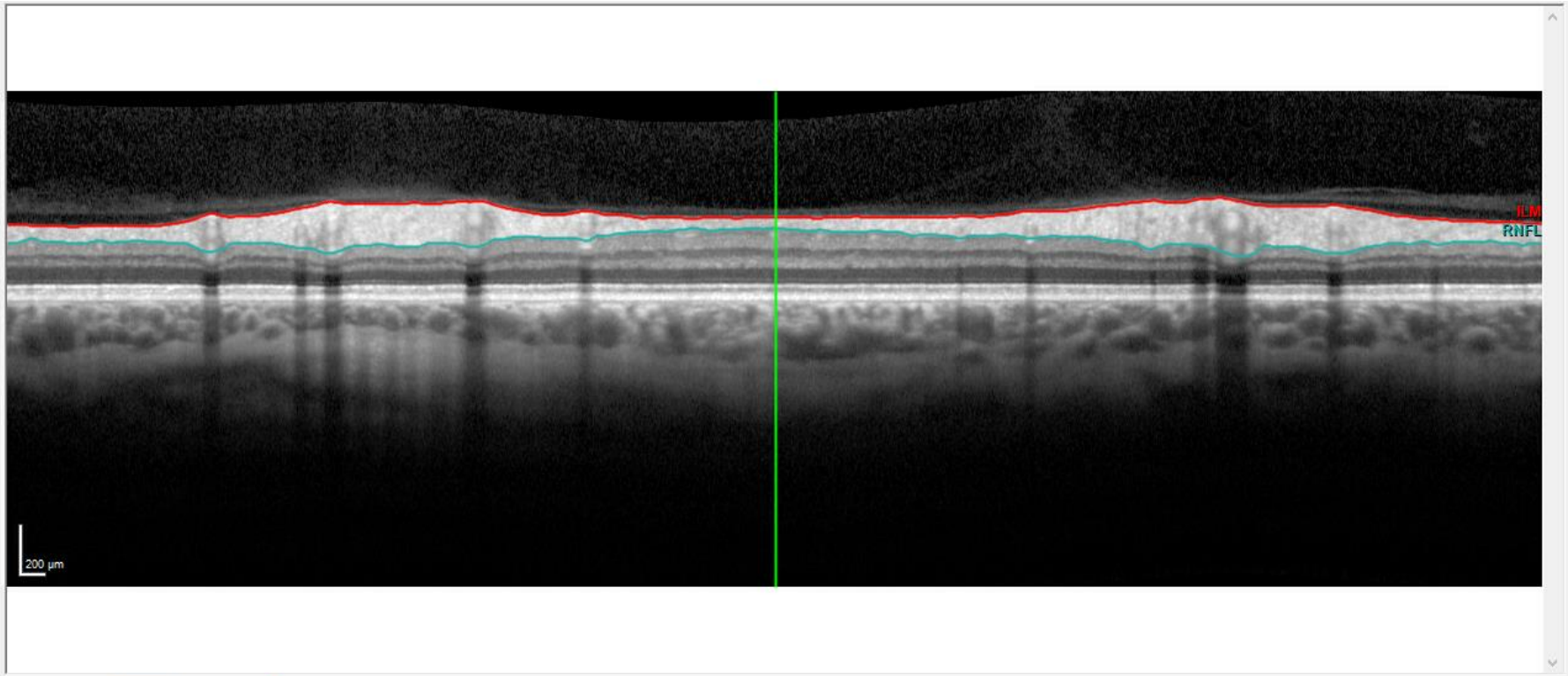


Papil



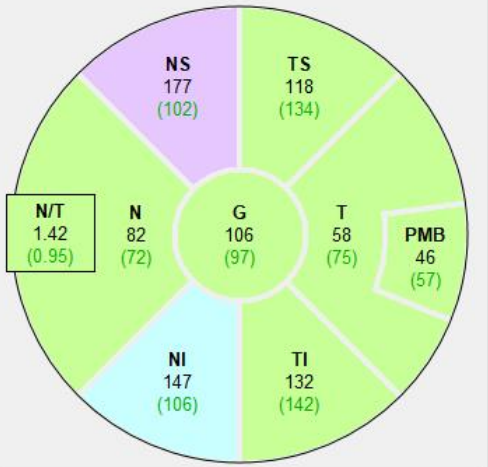
Nervus opticus



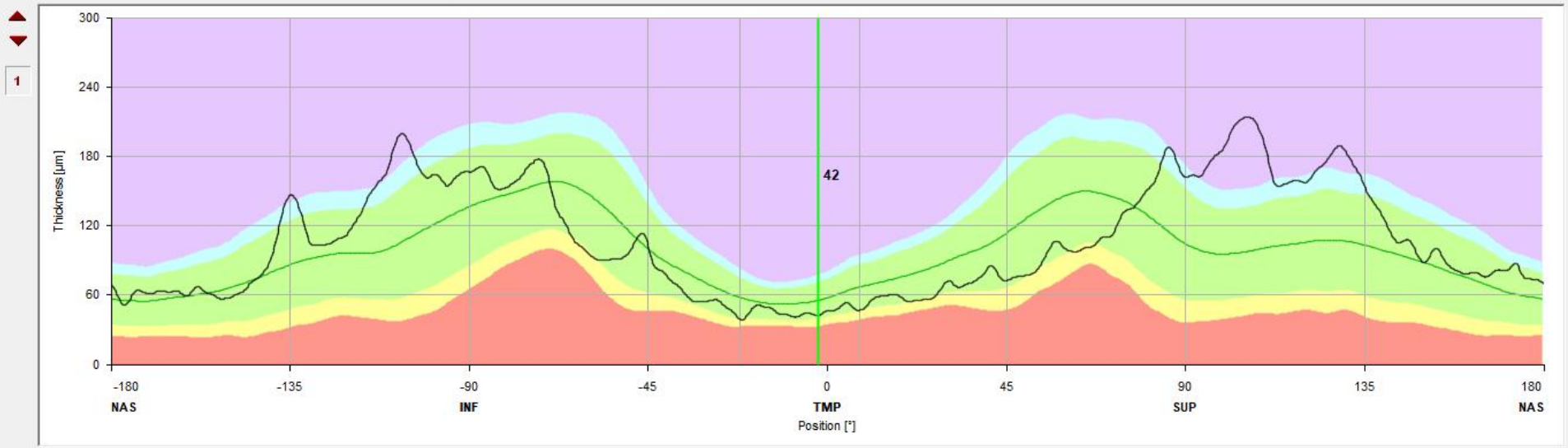


1:1 pixel | 1:1 µm | Layer: Nerve Fiber Layer

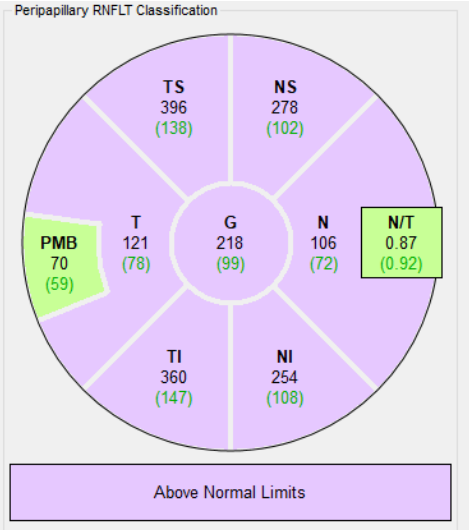
Peripapillary RNFLT Classification

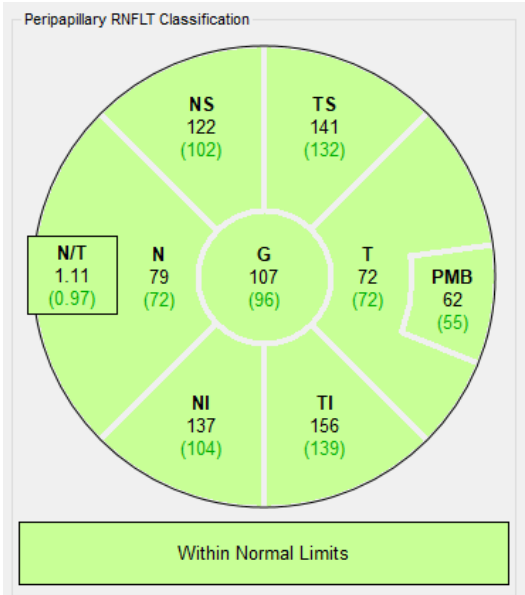


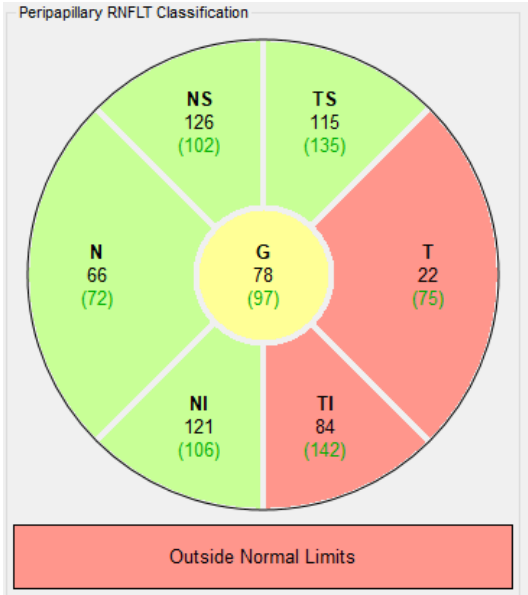
Above Normal Limits

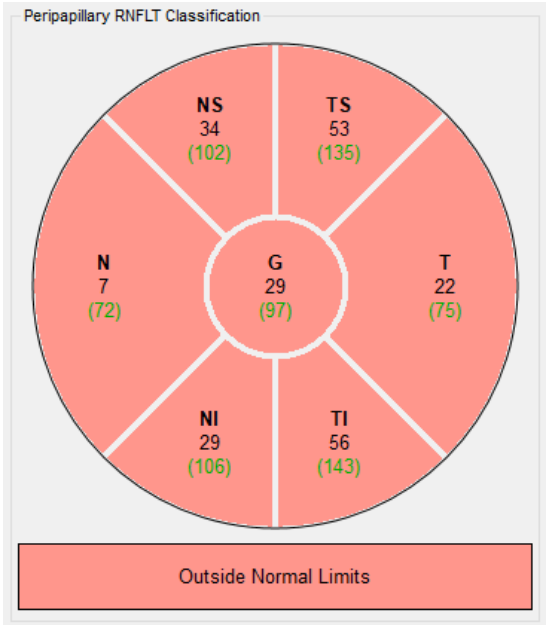


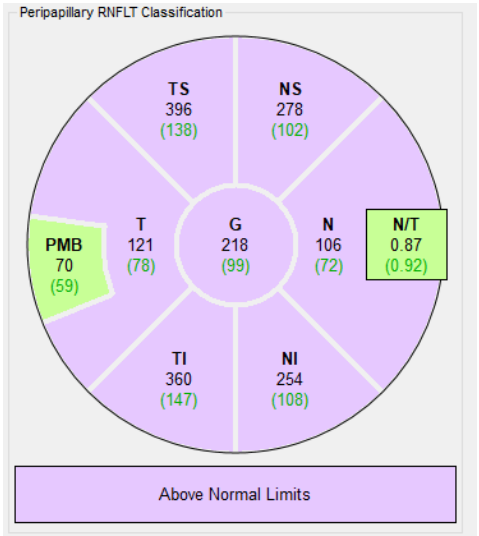
Reference database: European Descent (2009)

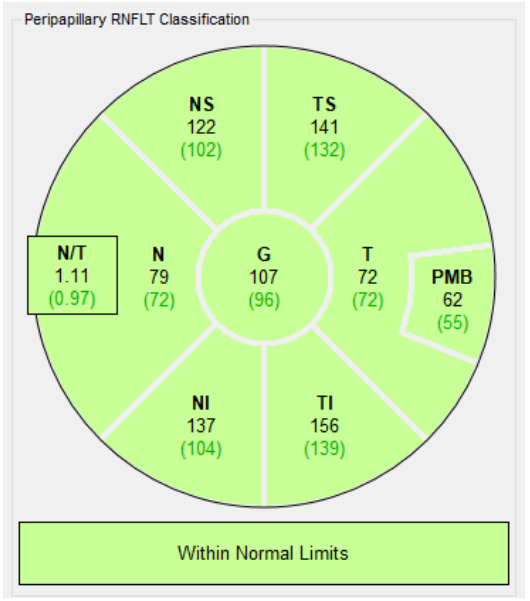

Peripapillary RNFLT Classification
TS
396
(138)
NS
278
(102)
T
121
(78)
G
218
(99)
N
106
(72)
N/T
0.87
(0.92)
PMB
70
(59)
TI
360
(147)
NI
254
(108)
Above Normal Limits

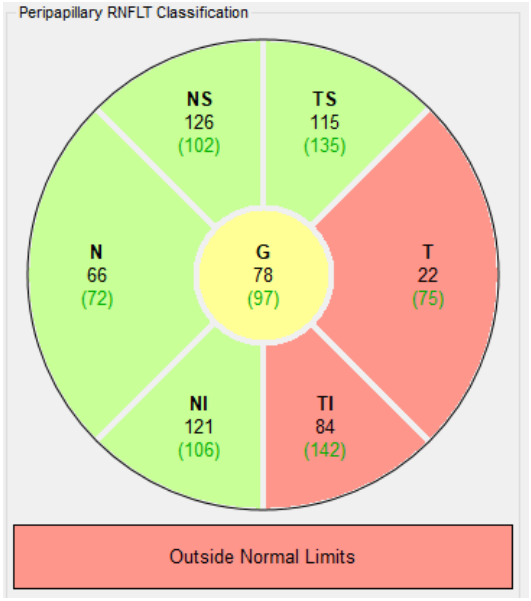

Peripapillary RNFLT Classification
NS
122
(102)
TS
141
(132)
N/T
1.11
(0.97)
N
79
(72)
G
107
(96)
T
72
(72)
PMB
62
(55)
NI
137
(104)
TI
156
(139)
Within Normal Limits

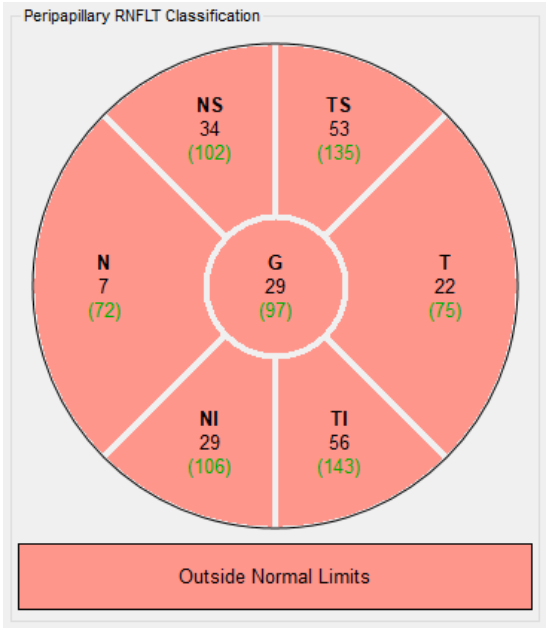

Peripapillary RNFLT Classification
NS
126
(102)
TS
115
(135)
N
66
(72)
G
78
(97)
T
22
(75)
NI
121
(106)
TI
84
(142)
Outside Normal Limits

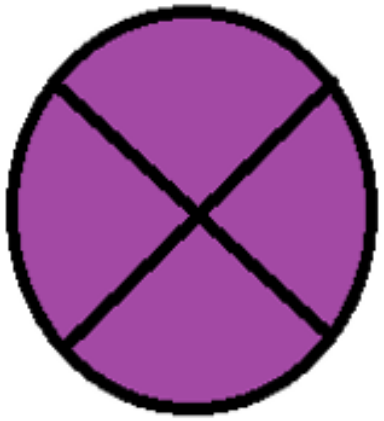

Peripapillary RNFLT Classification
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(102)
TS
53
(135)
N
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T
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(106)
TI
56
(143)
Outside Normal Limits

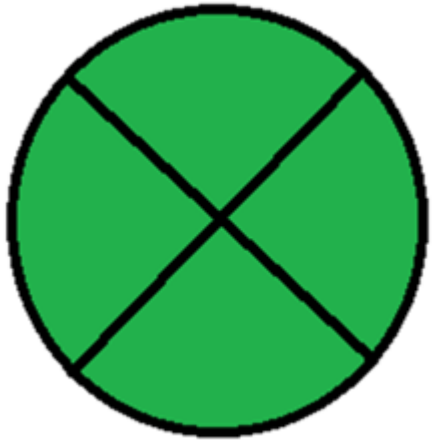

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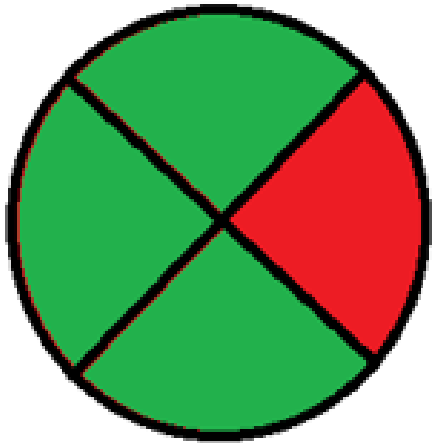

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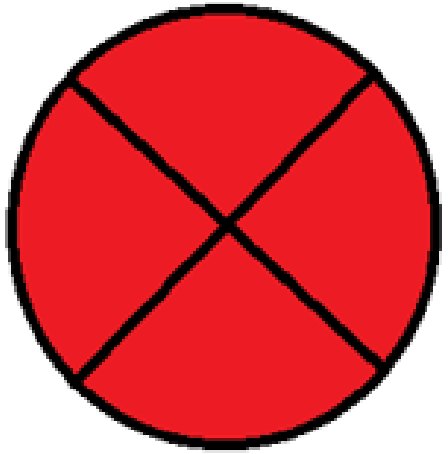

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TI
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Peripapillary RNFLT Classification
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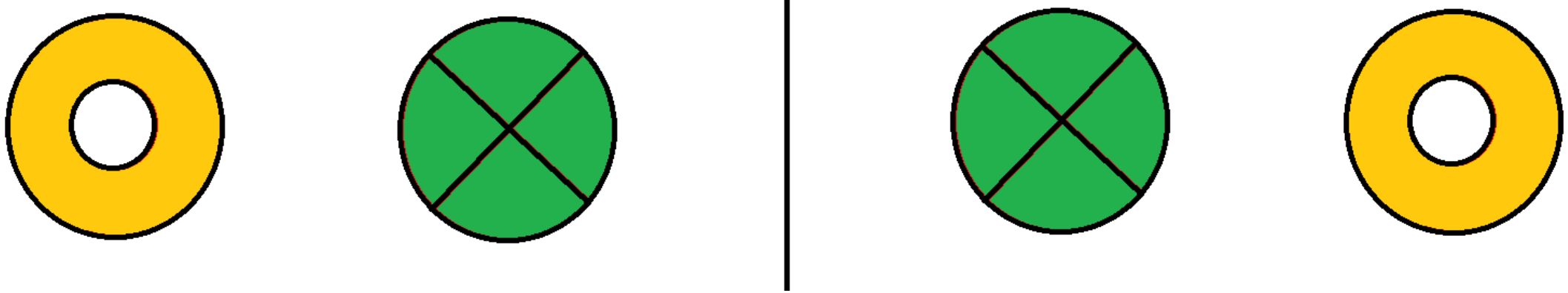






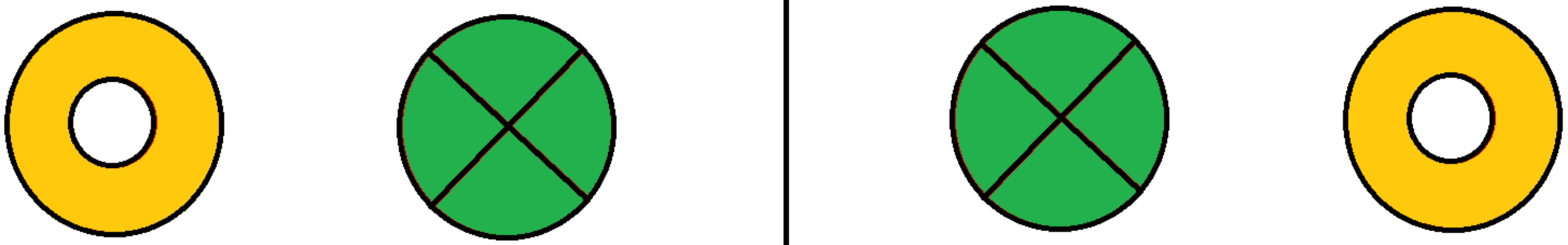


Normaal

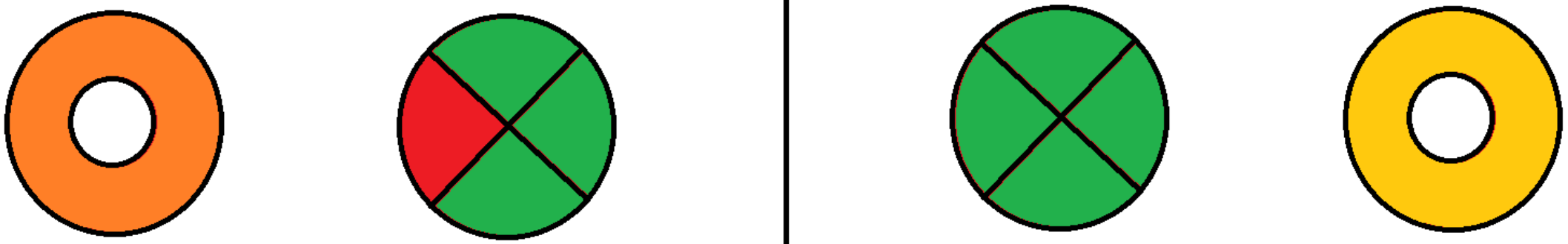


MS/idiopathische neuritis optica

Acuut:



Chronisch:

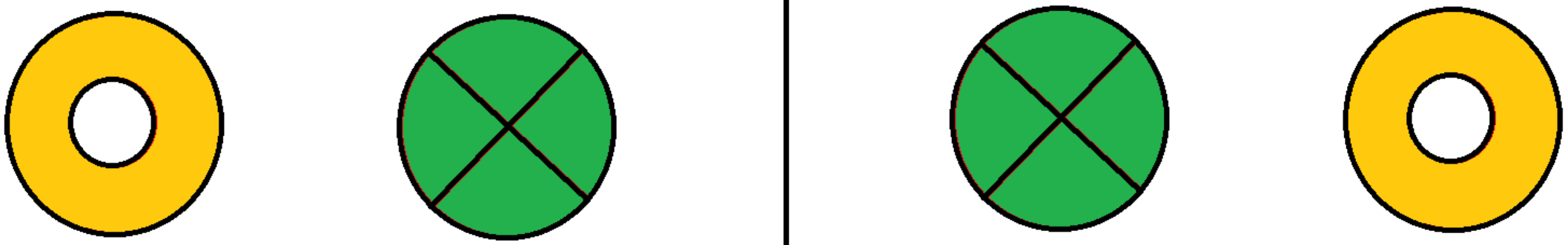


Andere vormen neuritis

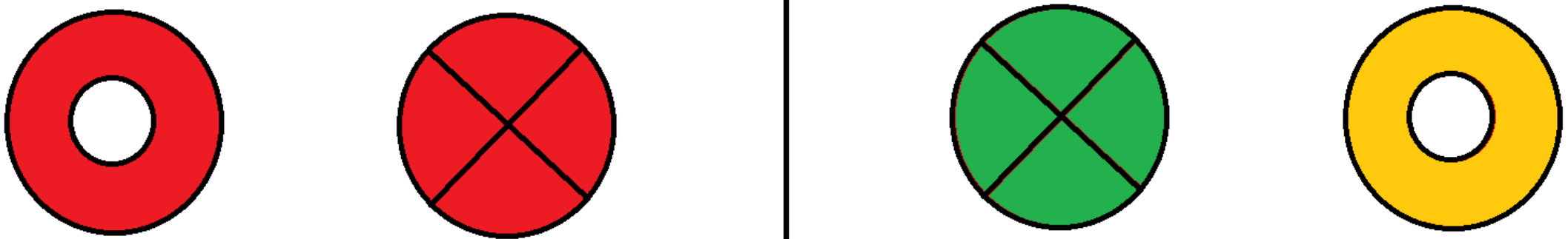
	NMOSD	MS	MOGAD
Vrouw:man	9:1	2.5:1	1:1
Bilateraal	20-30%	Zelden	50%
Papilzwelling	30%	30%	85%
Acute visus <0.1	80%	30%	Meesten (mediaan CF)
Chronisch visus <0.1	60%	4%	5%
MRI	Longitudinaal extensief Chiasma betrokkenheid	Korte segment laesies	Longitudinaal extensief Anterieur Perineurale aankleuring
CSF oligoclonale banden	15%	85%	10%
Antistoffen	Anti-aquaporine 4	Geen	Anti-MOG
Test-karakteristieken antistoffen	Sensitief en specifiek	X	Niet sensitief/specifiek
Relapsen	Bijna altijd	Frequent	~50%
Prednison stootkuur	Ja, tenzij	Op indicatie	Ja, tenzij
Plasmaferese	Ja, tenzij	Op indicatie	Op indicatie
Indicatie voor spoeddiagnostiek/ behandeling	Ja	Op indicatie	Meestal

NMOSD neuritis optica

Acuut:

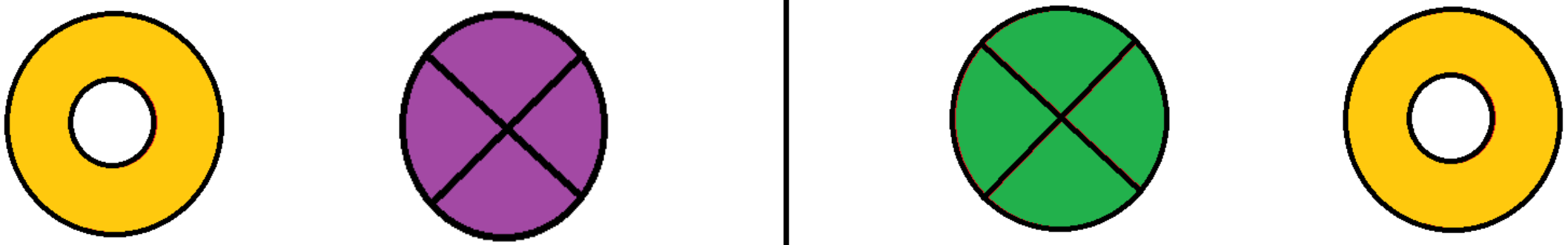


Chronisch:

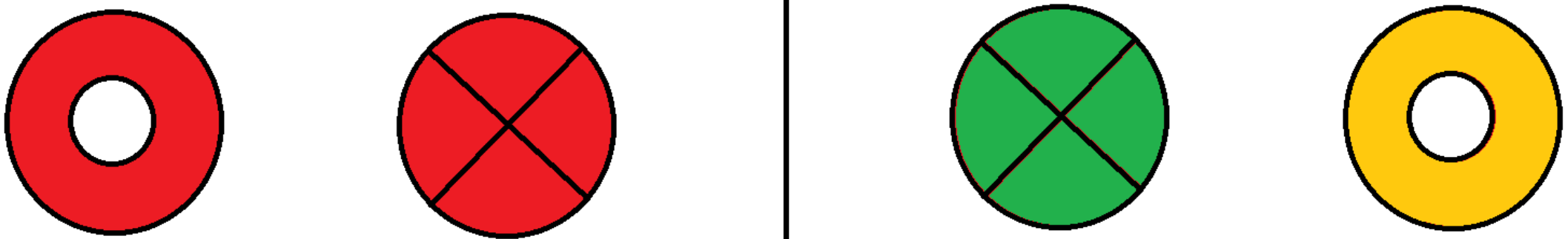


MOGAD neuritis optica

Acuut:



Chronisch:

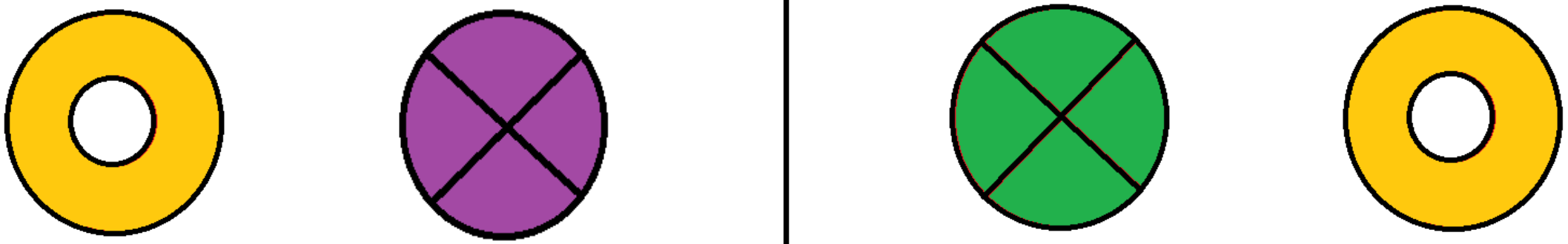


pRNFL en MOGAD

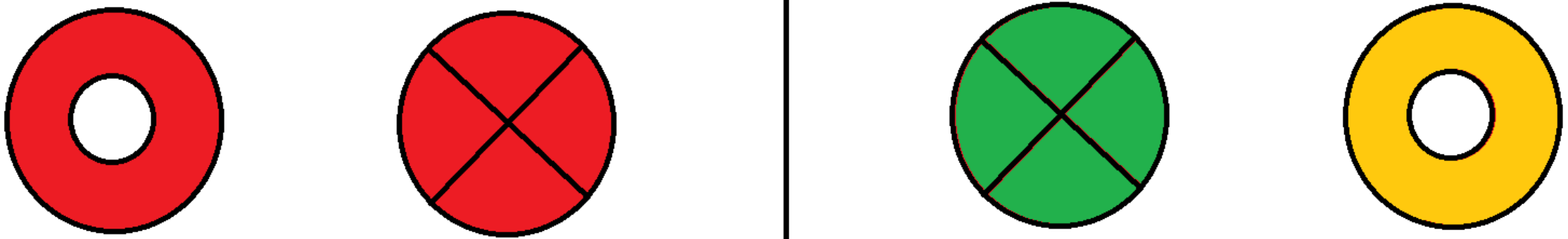
	Ten opzichte van		
	MS (117.5um)	**MS (175.0um)**	**NMOSD (118.0um)**
Sensitiviteit	92.9%	45%	82%
Specificiteit	71.1%	96%	74%

MOGAD neuritis optica en N-AION

Acuut:



Chronisch:



Acute opticopathie in ouderen met papilzwelling

RESEARCH ARTICLE OPEN ACCESS

Acute Optic Neuropathy in Older Adults

Differentiating Between MOGAD Optic Neuritis and Nonarteritic Anterior Ischemic Optic Neuropathy

Nanthaya Tisavipat, MD,* Hadas Stiebel-Kalish, MD,* Dahlia Palevski, MD, Omer Y. Bialer, MD, Heather E. Moss, MD, PhD, Pareena Chaitanuwong, MD, Tanyatuth Padungkiatsagul, MD, Amanda D. Henderson, MD, Elias S. Sotirchos, MD, Shonar Singh, MD, Abdul-Rahman Salman, BS, Deena A. Tajfirouz, MD, Kevin D. Chodnicki, MD, Sean J. Pittock, MD, Eoin P. Flanagan, MBBCh, and John J. Chen, MD, PhD

Correspondence
Dr. Chen
chen.john@mayo.edu

Acute opticopathie in ouderen met papilzwelling

- Inclusiecriteria MOGAD
  - Voldoen aan 2023 MOGAD criteria
  - Unilaterale neuritis optica als eerste episode
  - ≥45 jaar
  - Papilzwelling
    - (ook inclusie zonder papilzwelling, maar weggelaten voor deze presentatie)

  - NB: dus de groep waarbij er diagnostische twijfel is over N-AION

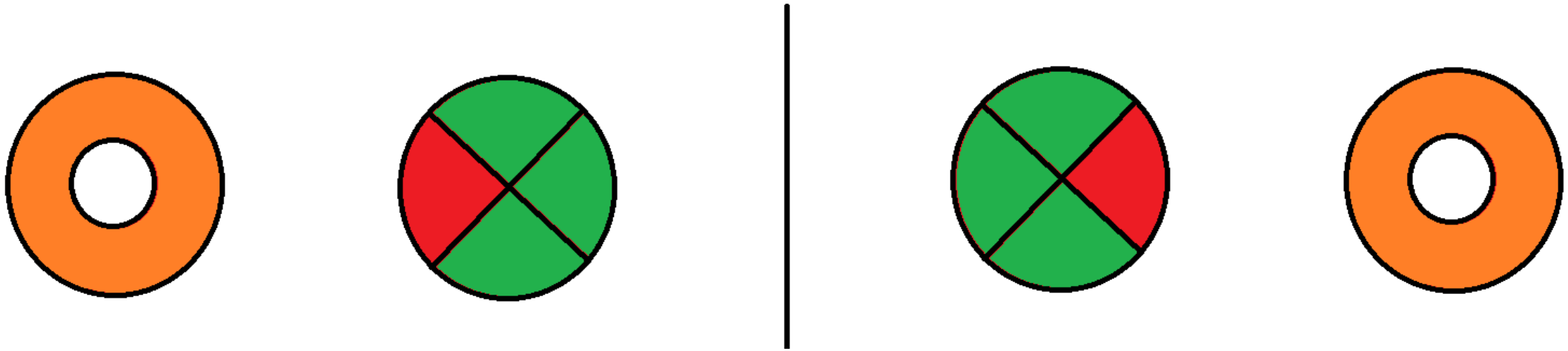
Acute opticopathie in ouderen met papilzwelling

- Inclusiecriteria MOGAD
- Inclusiecriteria N-AION
  - Age-matched en sex-matched op 1:1 ratio met MOGAD, geen dreigende N-AION

Acute opticopathie in ouderen met papilzwelling

	N-AION (64)	MOGAD-NO met papilzwelling (37)
Leeftijd; (mediaan)	56.5	57.3
Vrouw; n (%)	45 (70.3)	26 (70.3)
≥2 cardiovasculaire risicofactoren; n (%)	50 (78.1)	21 (56.8)
Crowded optic disc	51/64 (81.0)	13/32 (40.6)
Oogpijn	14 (21.9)	33 (89.2)
Toename pijn bij oogbewegingen	2/14 (14.3)	22/26 (84.6)
Altitudinaal HFA defect	47 (73.4)	5/33 (15.2)
Acute pRNFL; mediaan (IQR)	201 (155-240)	145.5 (101-215)

Metabool / hereditair

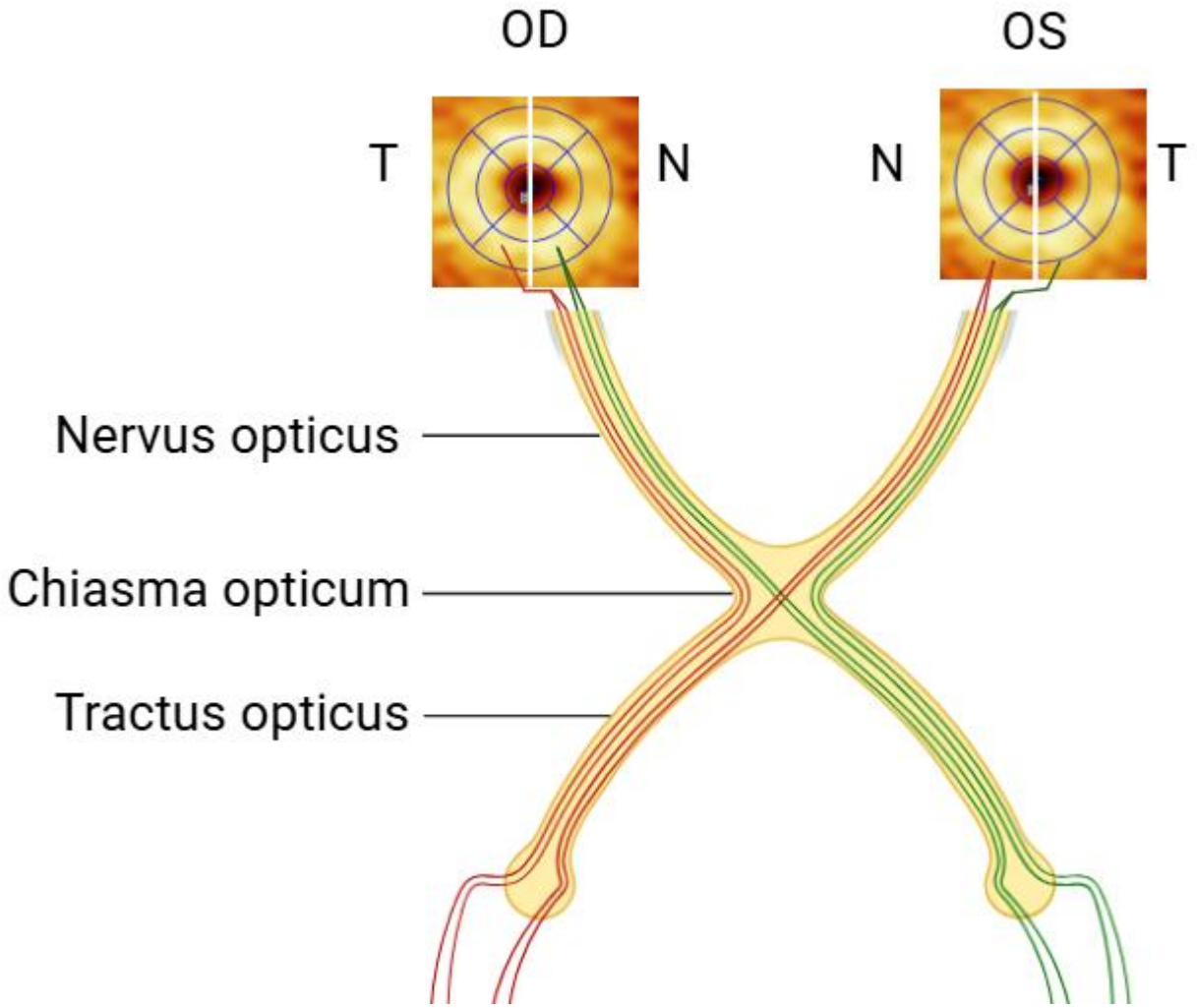


Hereditair (2)

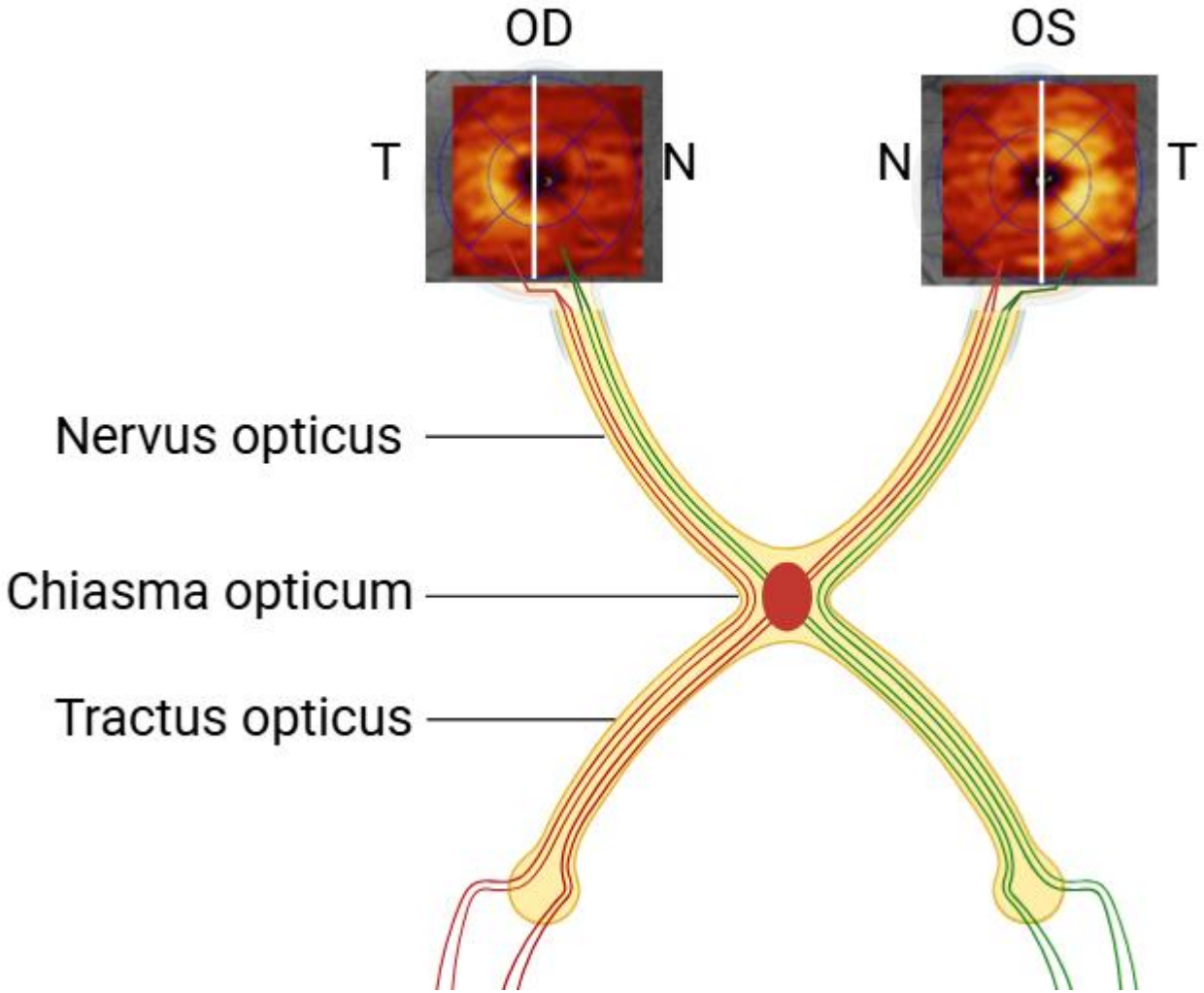


Voorbij de nervus opticus?

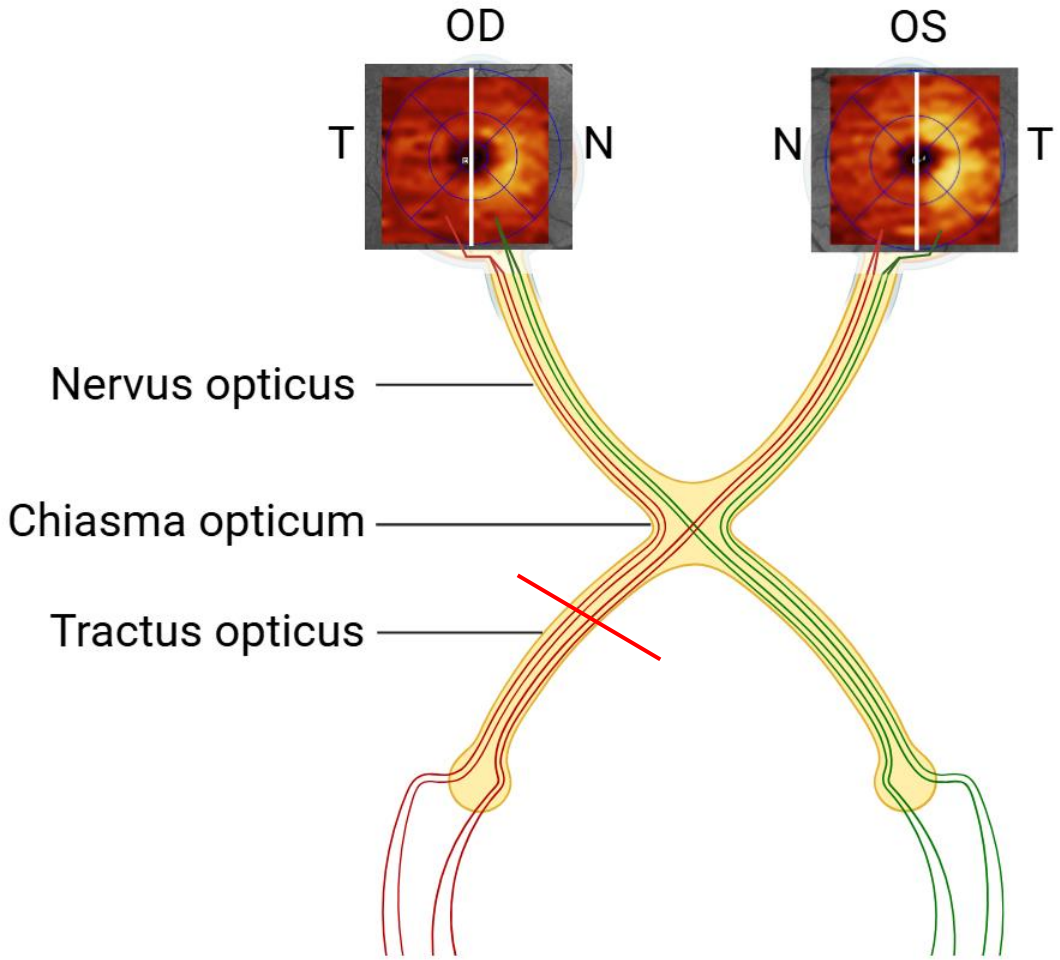
Gezond



Chiasma pathologie



Tractus opticus / retrogeniculaire pathologie



Samenvattend

- Geen GCL atrofie in acute stadium, behalve bij hereditaire (LHON)-opticopathie

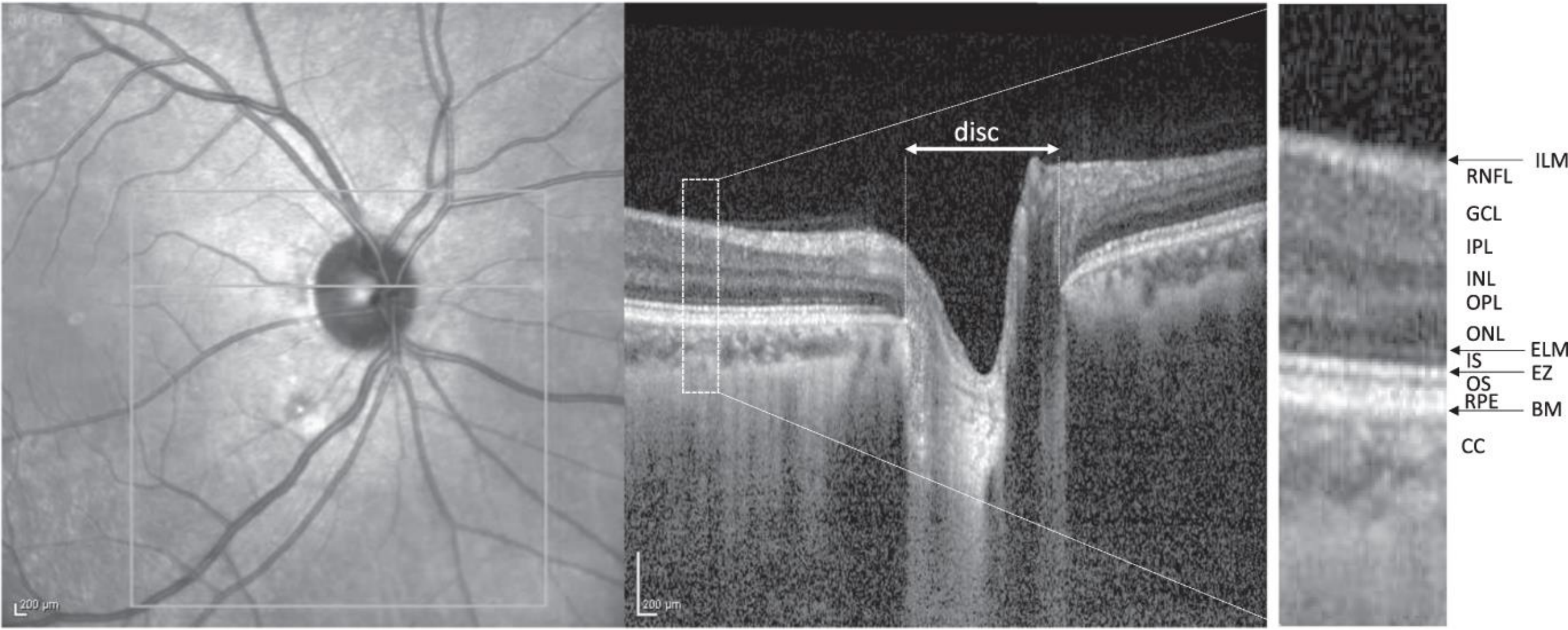
- Wel GCL atrofie in chronische stadium
  - Indien geen GCL atrofie is een opticopathie erg onwaarschijnlijk

- Patroon van GCL atrofie is een aanwijzing voor de oorzaak van de opticopathie (of chiasmale/retrochiasmale pathologie)

Papilscan

- Papiloedeem versus pseudo-papiloedeem

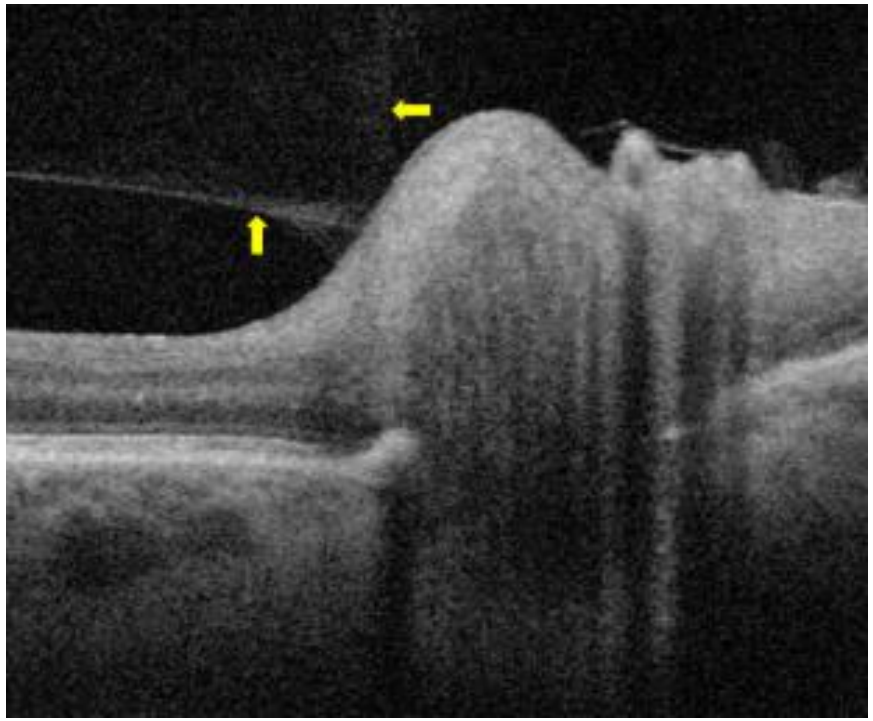
Papilscan


200 µm
disc
200 µm
ILM
RNFL
GCL
IPL
INL
OPL
ONL
ELM
IS
EZ
OS
RPE
BM
CC

Papilscan

- Vitreopapillaire tractie
- PHOMS (Peripapillary Hyperreflective Ovoid Mass-Like Structures)
- Papildrusen
- Aanwijzingen voor papiloedeem
  - Anterieure verplaatsing membraan van Bruch
  - Peripapillair subretinaal vocht
  - Peripapillaire RNFL plooien

Vitreopapillaire tractie



PHOMS

- Definitie
  - Strikt peripapillair en boven membraan van Bruch
  - Opwaartse deflectie van tenminste twee retinale lagen
  - Signaal is soortgelijk aan de retinale zenuwvezellaag en ganglioncellaag

NEURO-OPHTHALMOLOGY
2020, VOL. 44, NO. 6, 413–414
https://doi.org/10.1080/01658107.2020.1760891

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LETTER TO THE EDITOR

Check for updates

Multirater Validation of Peripapillary Hyperreflective Ovoid Mass-like Structures (PHOMS)

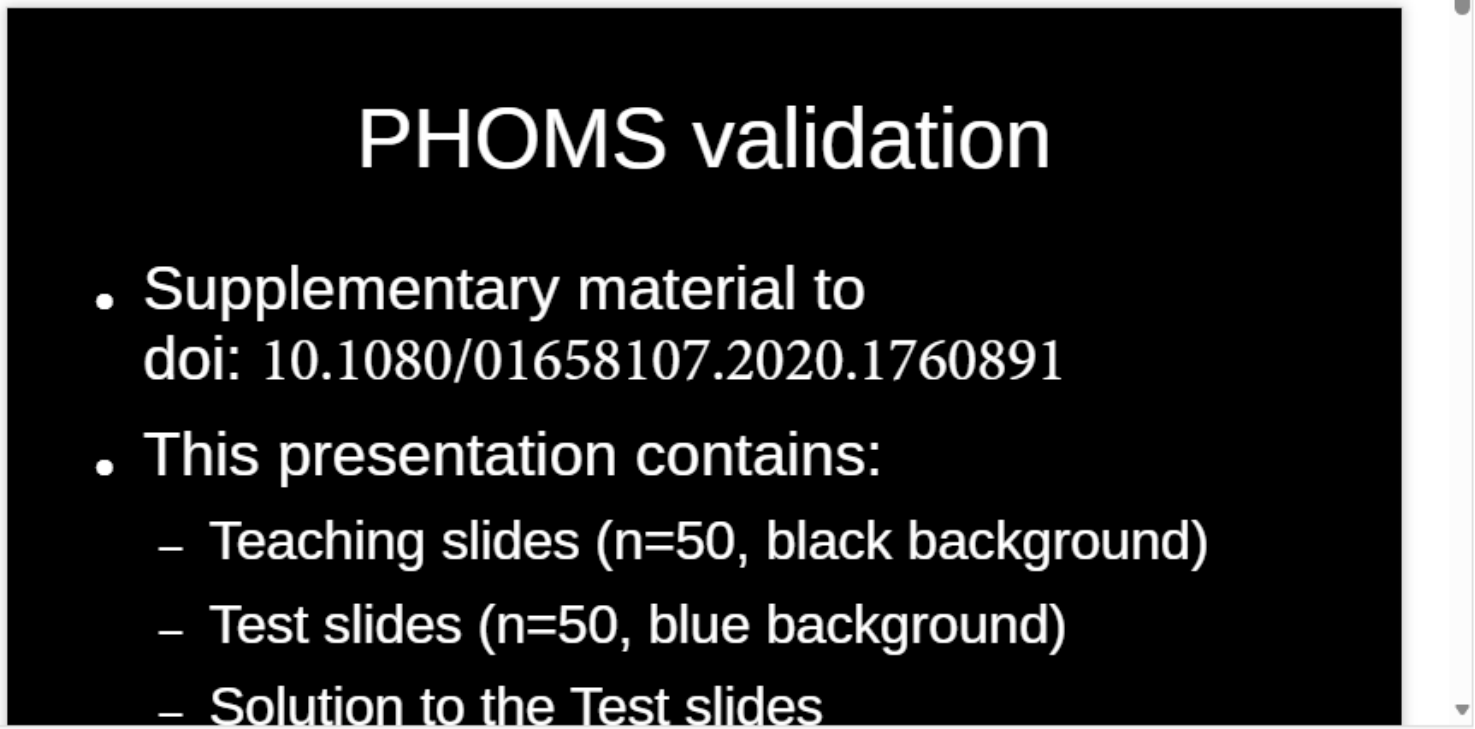
Axel Petzold [a,b], Valerie Biousse[c], Lulu Bursztyn[d], Fiona Costello[e], Alison Crum[f], Kathleen Digre[g], Clare Fraser [h], J. Alex Fraser[i], Bradley Katz[f], Neringa Jurkute[j], Nancy Newman[k], Jette Lautrup-Battistini[l], Mitchell Lawlor[h], Petra Liskova[m], Birgit Lorenz[n], Lasse Malmqvist[o], Jason Peragallo[c], Patrick Sibony[p], Prem Subramanian[q], Robert Rejdak [r], Katarzyna Nowomiejska[r], Valerie Touitou[s], Judith Warner[t], Marianne Wegener[o], Sui Wong[u], Patrick Yu-Wai-Man[v,w], and Steffen Hamann[x]

PHOMS

Supplemental material

Multirater Validation of Peripapillary Hyperreflective Ovoid Mass-like Structures (PHOMS)

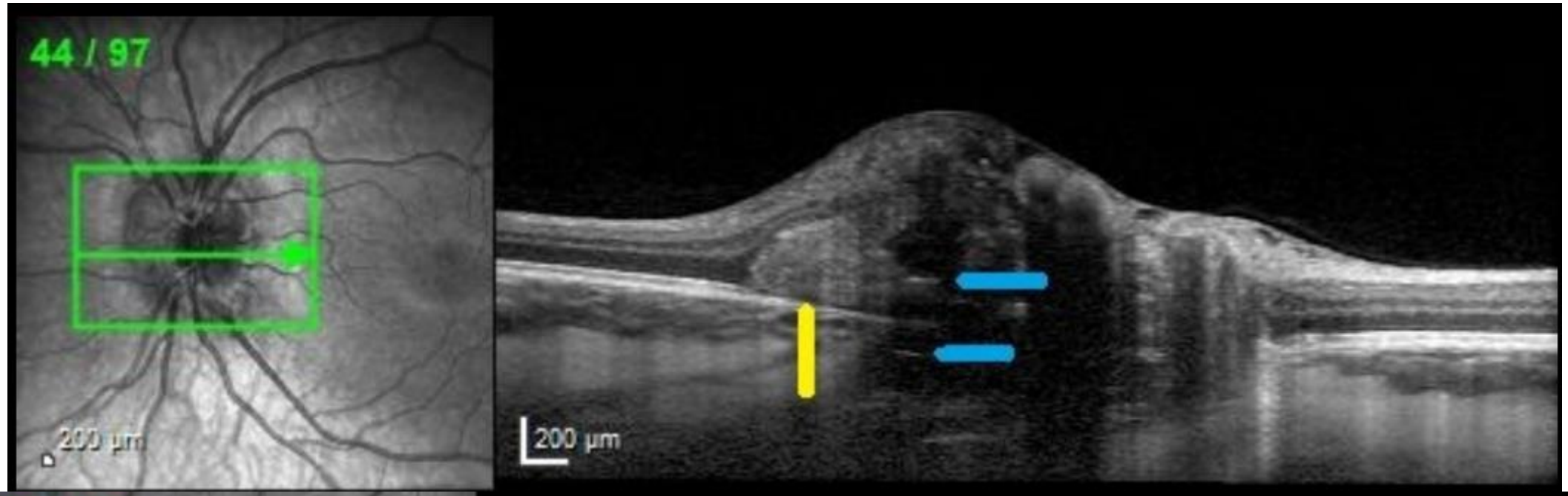
896 views | 0 shares | 315 downloads

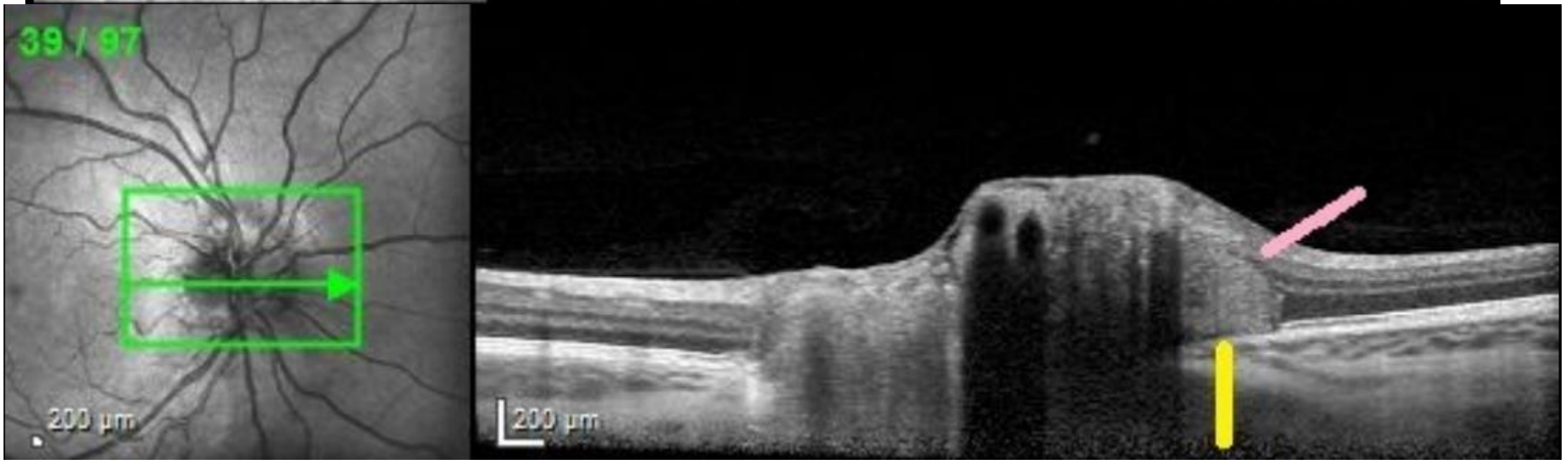


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Supplemental Material

Supplemental data for this article can be accessed online at http://dx.doi.org/10.1080/01658107.2020.1760891.

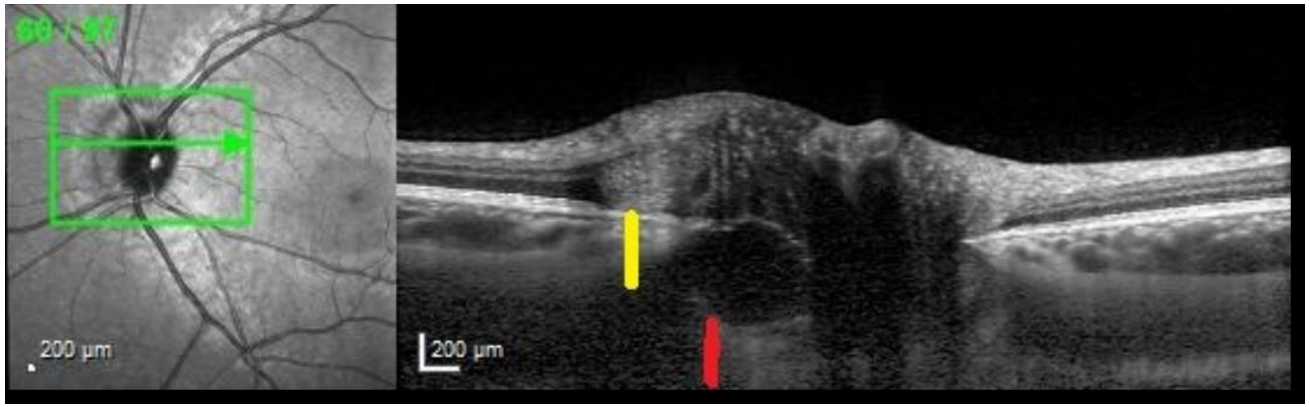

44 / 97
200 µm
200 µm

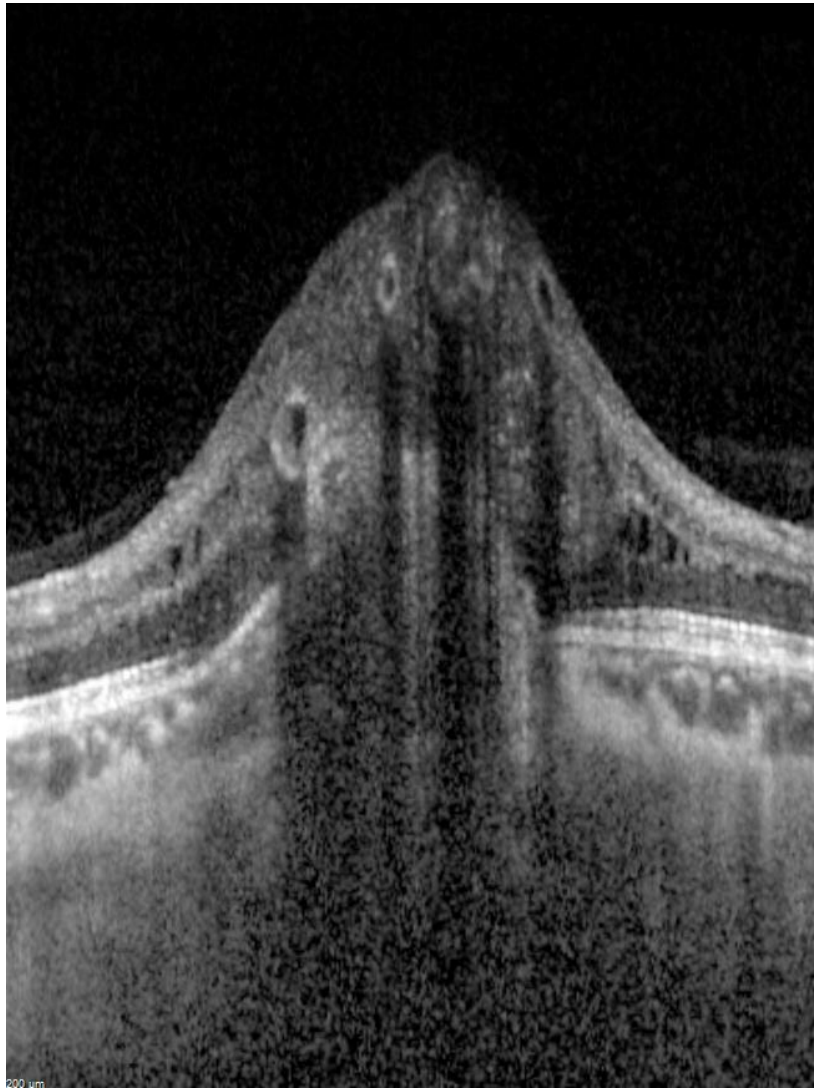

39 / 97
200 µm
200 µm

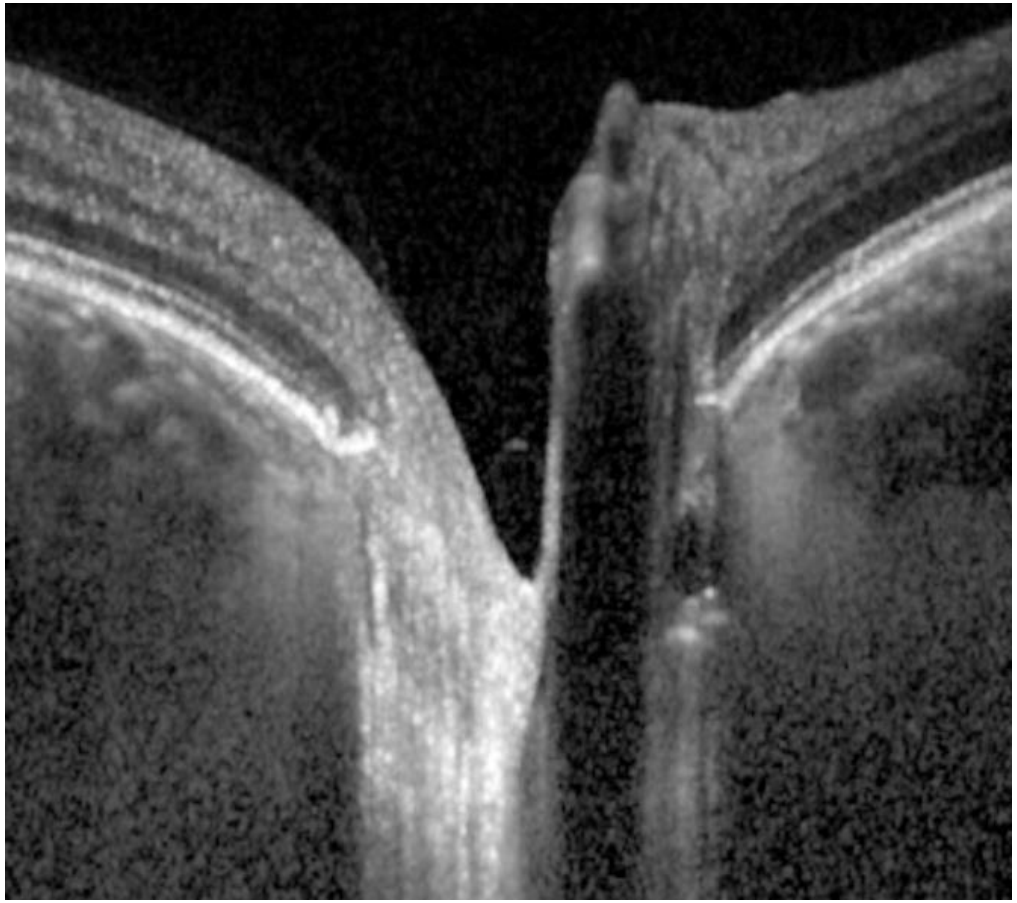
Papildrusen

- Best zichtbaar op EDI scans (gouden standaard)
- Definitie
  - Hyporeflectieve structuren met een volledige of partiële hyperreflectieve rand
    - Hyperreflectieve rand is superieur meest prominent aanwezig en kan moeilijk zijn om te detecteren

Papildrusen

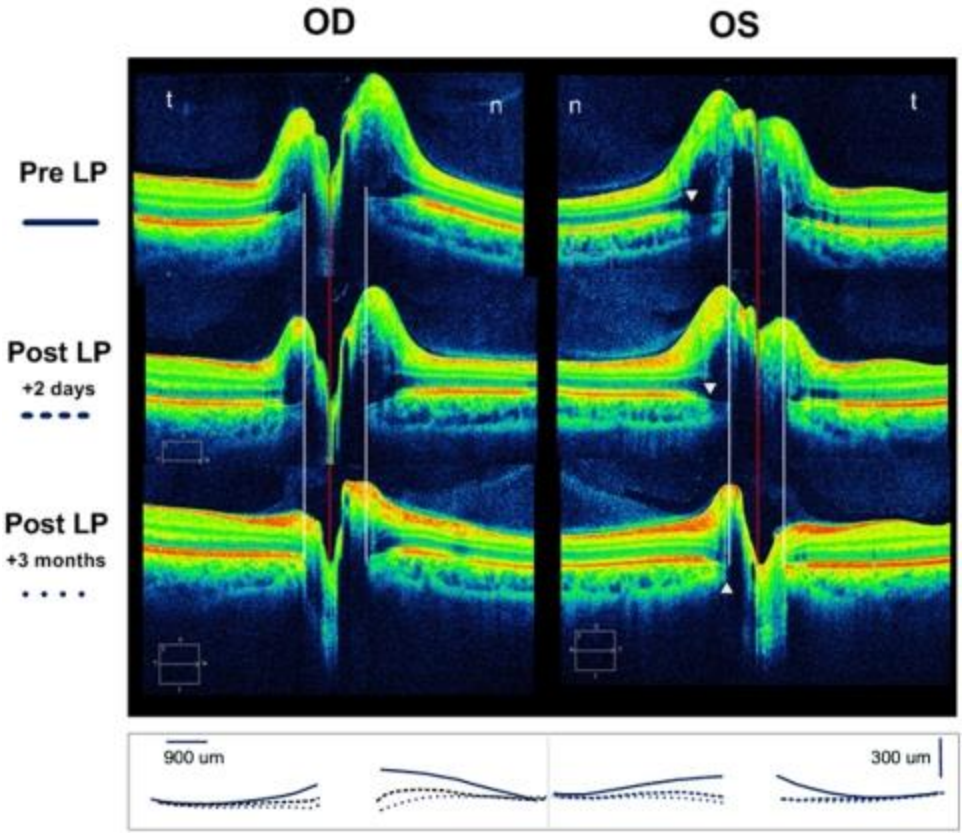






Aanwijzingen papiloedeem

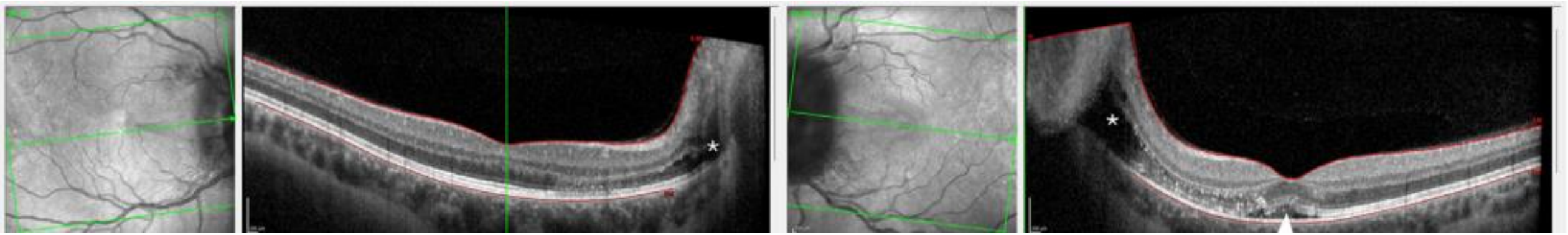
- Anterieure verplaatsing Bruch



Sibony et al. Invest Ophthalmol Vis Sci 2011

Aanwijzingen papiloedeem

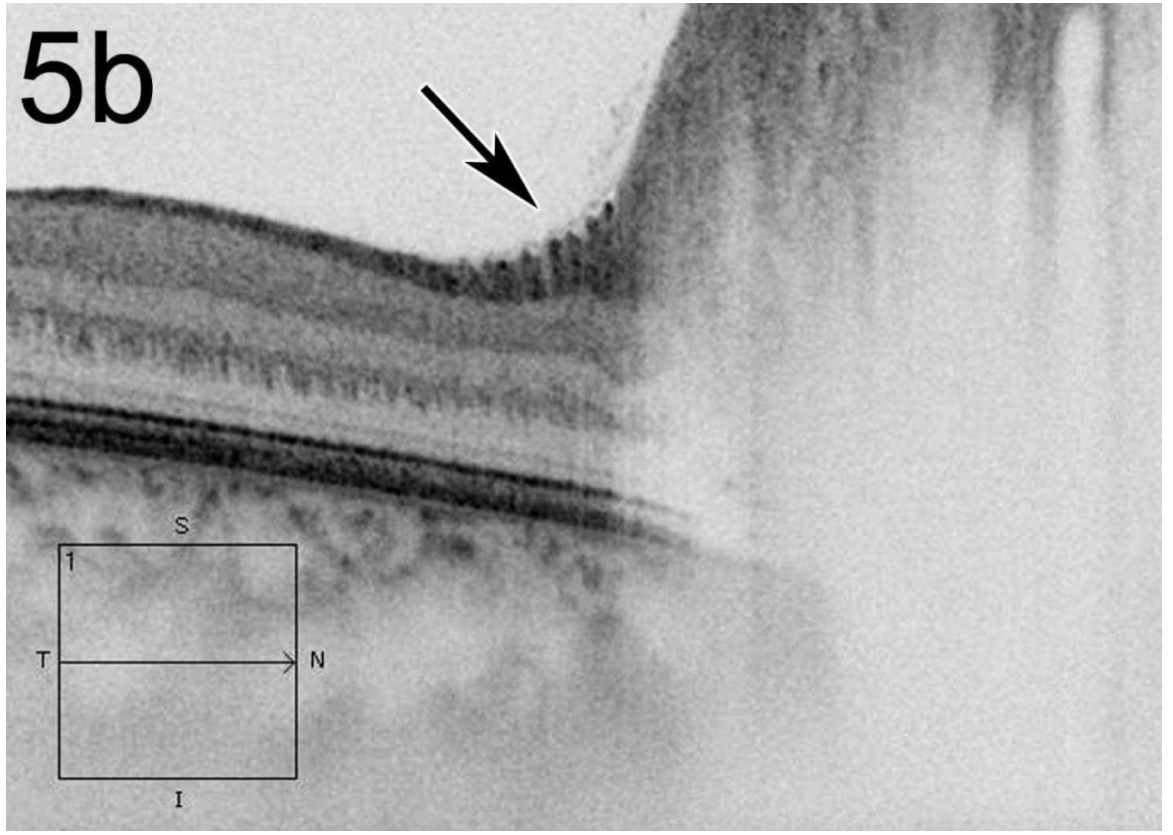
- Anterieure verplaatsing Bruch
- Peripapillair subretinaal vocht



Lowe et al. Practical Neurology 2026

Aanwijzingen papiloedeem

- Anterieure verplaatsing Bruch
- Peripapillair subretinaal vocht
- Peripapillaire RNFL plooien



Aanwijzingen papiloedeem

		Diagnosis									
Biomarker		**Pap (n = 79)**	**ODD (n = 76)**	**TOD (n = 44)**	**COD (n = 14)**	**Odds ratio**	***P* value**	**Sensitivity**		**Specificity**	
Hypo-reflective Cores (absence)	N (%)	71 (89.9)	3 (4.0)	43 (97.7)	12 (85.7)	15.04	< 0.001	89.87		56.72	
Hyperreflective Lines (absence)	N (%)	62 (78.5)	13 (17.1)	37 (84.1)	10 (71.4)	1.28	< 0.001	78.48		55.22	
PHOMS (presence)	N (%)	65 (82.3)	68 (89.5)	34 (77.3)	8 (57.1)	1.20	0.024	82.28	65.8	17.91	93.3
BM/RPE Angulation (+ve)	N (%)	32 (40.5)	5 (6.6)	6 (13.6)	1 (7.1)	4.68	< 0.001	40.51		91.04	
Folds (presence)	N (%)	43 (54.4)	6 (7.9)	3 (6.8)	0 (0)	29.94	< 0.001	54.43		93.28	

Sekhri et al. scientific reports 2025

Papilscan

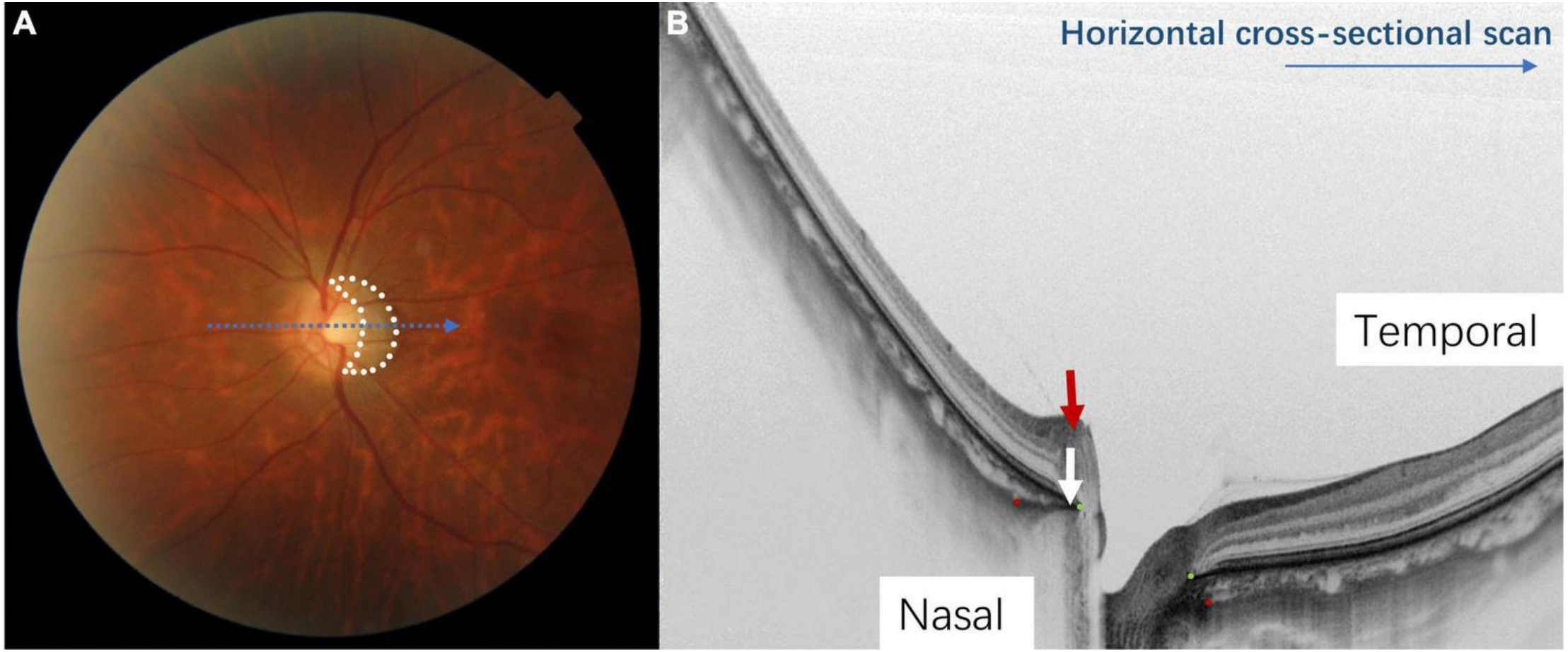
- Vitreopapillaire tractie



- Peripapillaire RNFL plooien

- Aanrader: Lowe et al. Practical Neurology 2026

Tilted disc



Tilted disc

- RNFL-profielen verschuiven
- Sectoren worden asymmetrisch
- GCL verdelingen veranderen
- Vaker segmentatie artefacten

A-AION versus N-AION

PAMM en intraretinaal vocht:
A-AION versus N-AION

Combining Paracentral Acute Middle Maculopathy and Peripapillary Fluid as Biomarkers in Anterior Ischemic Optic Neuropathy

OLIVER NIELS KLEFTER, MICHAEL STORMLY HANSEN, LEA LYKKEBIRK, YOUSIF SUBHI, JANE MAESTRI BRITTAIN, MADS RADMER JENSEN, UFFE MØLLER DØHN, VIKTORIA FANA, ANNE KATRINE WIENCKE, STEFFEN HEEGAARD, LENE TERSLEV, AND STEFFEN HAMANN

PAMM en intraretinaal vocht: A-AION versus N-AION

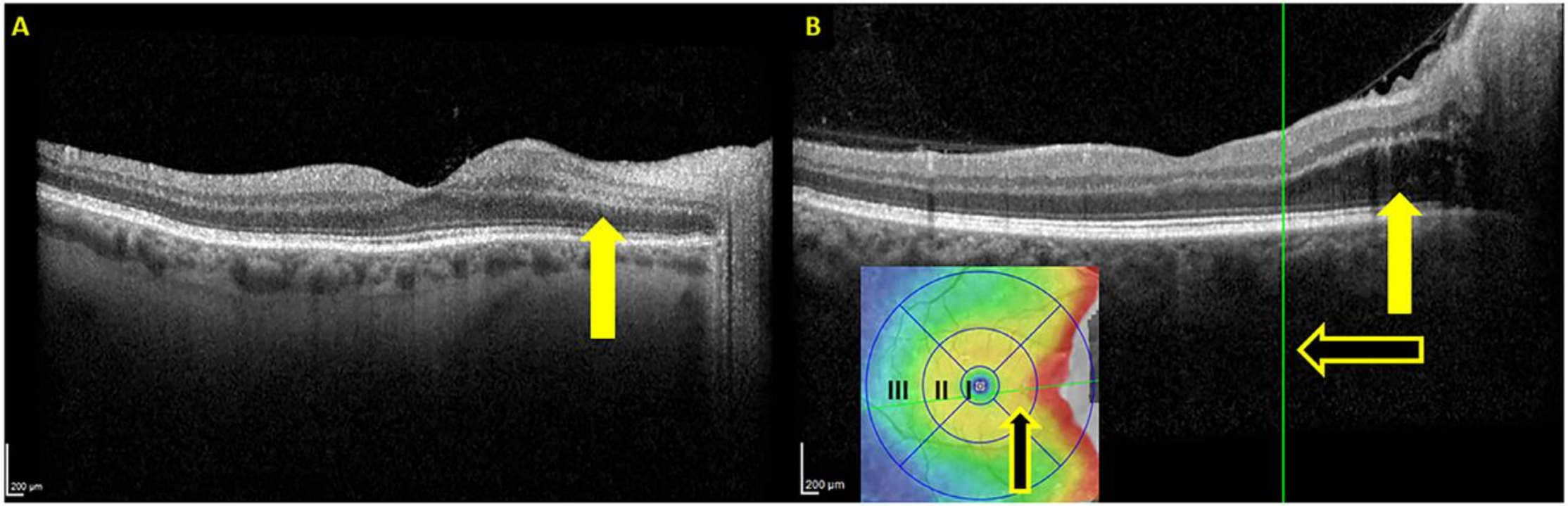


FIGURE. Macular optical coherence tomography (OCT) of the right eye in a patient with arteritic anterior ischemic optic neuropathy (A) and nonarteritic anterior ischemic optic neuropathy (B). The first OCT B-scan shows peripapillary paracentral acute middle maculopathy (A, yellow arrow). The second OCT B-scan shows peripapillary intraretinal fluid (B, yellow arrow) which extends into the second ring of the fovea-centered Early Treatment Diabetic Retinopathy Study grid (B, inset, black arrow). The vertical green bar (B, black arrow) delimits the leading edge of the intraretinal fluid. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article)

PAMM en intraretinaal vocht: A-AION versus N-AION

TABLE 3. Combining Optical Coherence Tomography Biomarkers in Anterior Ischemic Optic Neuropathy

	Arteritic AION	Nonarteritic AION
No PAMM, Fluid in ring III[a] (N)	0	20[b]
No PAMM, No fluid in ring III[a] (N)	4	4
PAMM, Fluid in ring III[a] (N)	0	0
PAMM, No fluid in ring III[a] (N)	4	0[b]

AION = anterior ischemic optic neuropathy; PAMM = paracentral acute middle maculopathy.

[a]peripapillary fluid extending into the Early Treatment Diabetic Retinopathy Study grid, within 3 mm of the center of the fovea.

[b]combinations of biomarker findings that resulted in correct classification into arteritic or nonarteritic AION. In total 24 of 32 patients (75%) could be correctly classified based on optical coherence tomography findings.

PAMM en intraretinaal vocht: A-AION versus N-AION

- Verdenking AION
  - PAMM: A-AION
  - PAMM + intraretinaal vocht: A-AION
  - Intraretinaal vocht zonder PAMM: N-AION

TABLE 3. Combining Optical Coherence Tomography Biomarkers in Anterior Ischemic Optic Neuropathy

	Arteritic AION	Nonarteritic AION
No PAMM, Fluid in ring III[a] (N)	0	20[b]
No PAMM, No fluid in ring III[a] (N)	4	4
PAMM, Fluid in ring III[a] (N)	0	0
PAMM, No fluid in ring III[a] (N)	4	0[b]

Overleg

- Neuritis optica: 06-25716314
- Oogheelkunde (algemeen): 06-50087691
- Stage (neurologie en oogheelkunde): w.perini@amsterdamumc.nl

Vragen / discussie