

A service evaluation of the  
Eidon imaging system.

North East London DESP

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Haag-Streit UK

# True Colour Confocal Widefield Imaging for Diabetic Eye Screening

# Declarations

Haag-Streit are the UK distributor  
for the Eidon device.



Background

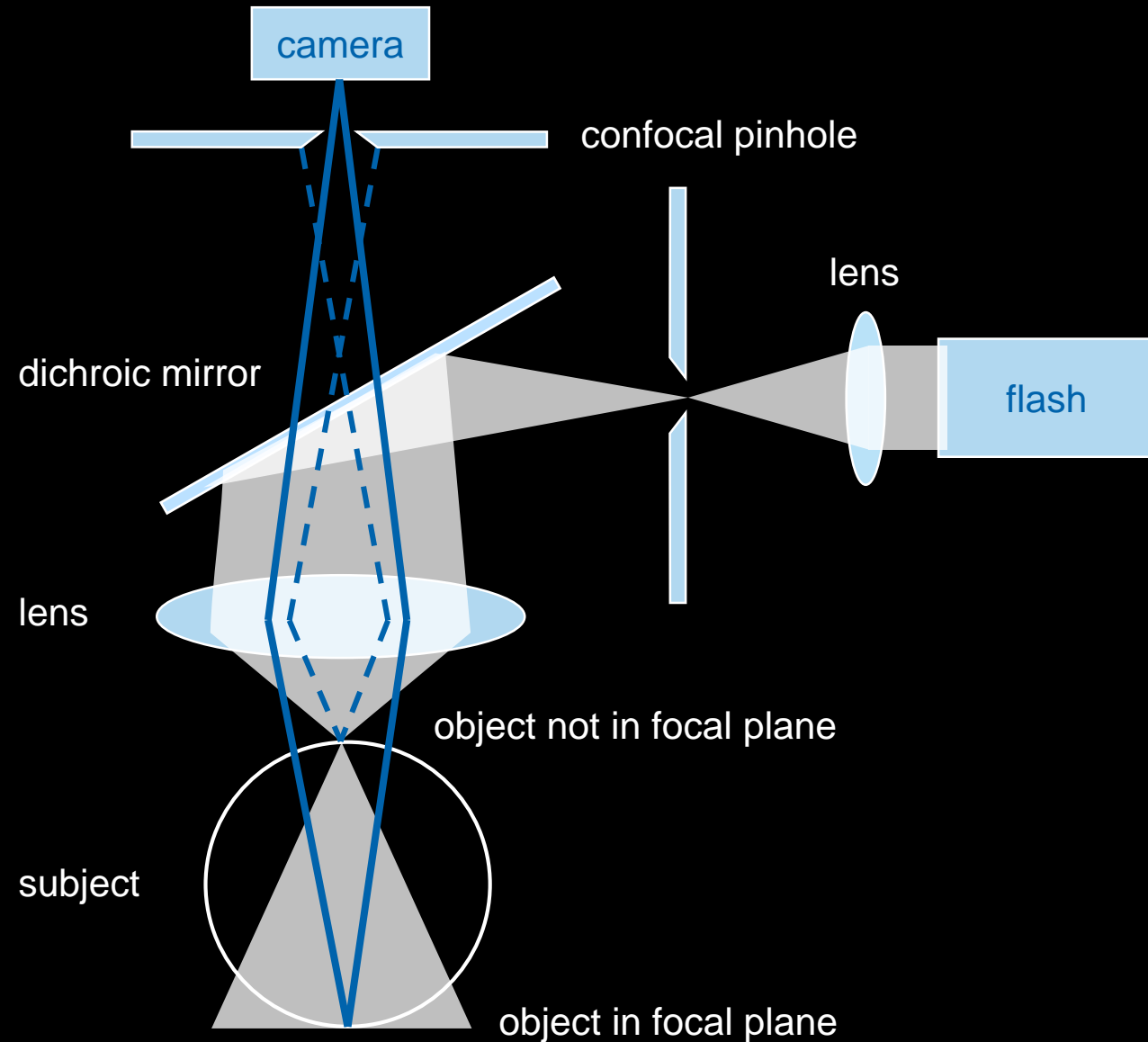
# True colour

Using white light with all wavelengths across the visible spectrum, from 650nm at the red end to 400nm at the violet end.



# Confocal

Pinholes at both the flash and the camera reduce scattered light and stop light from objects not in focal plane reaching the camera.



# Widfield

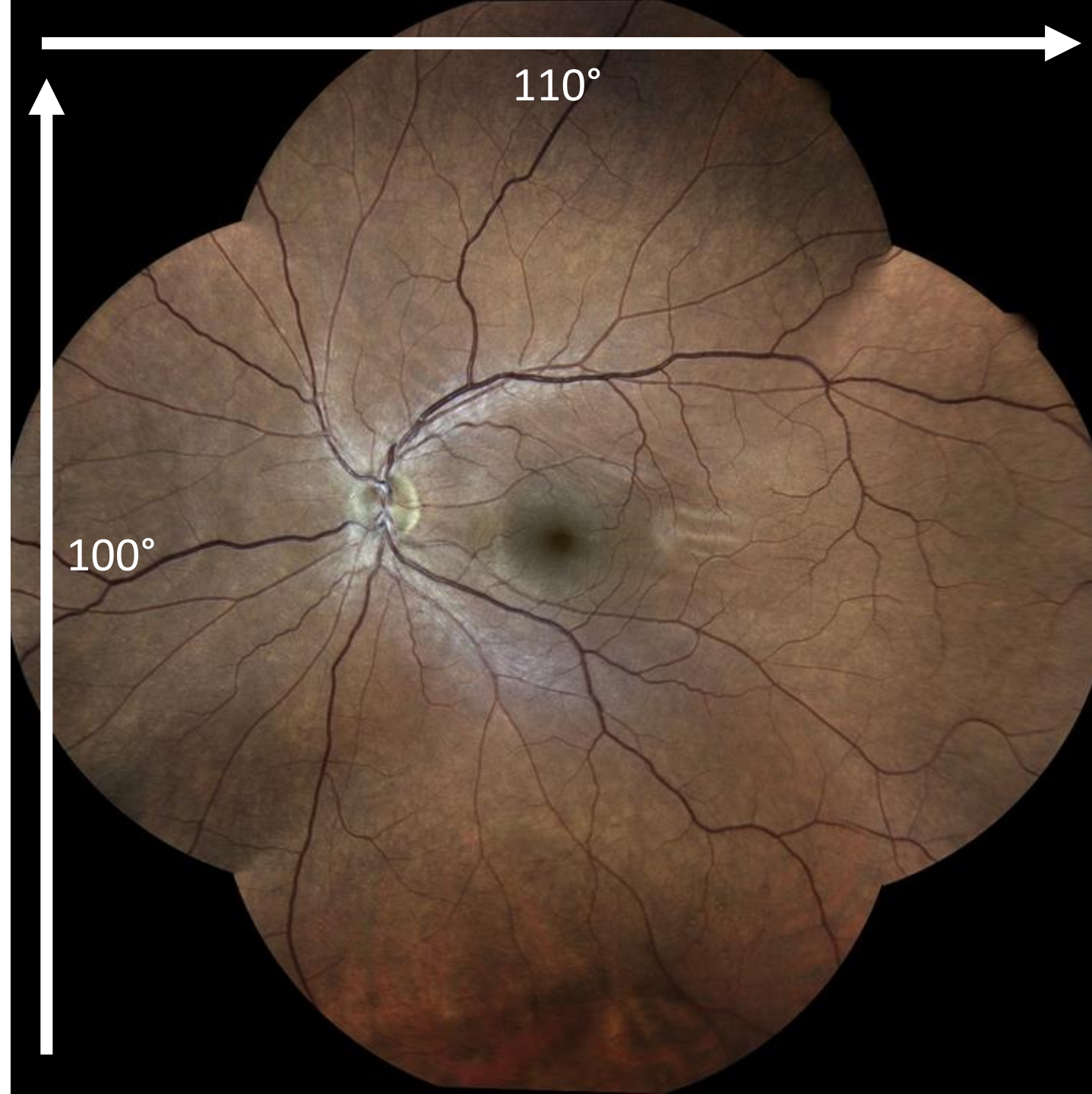
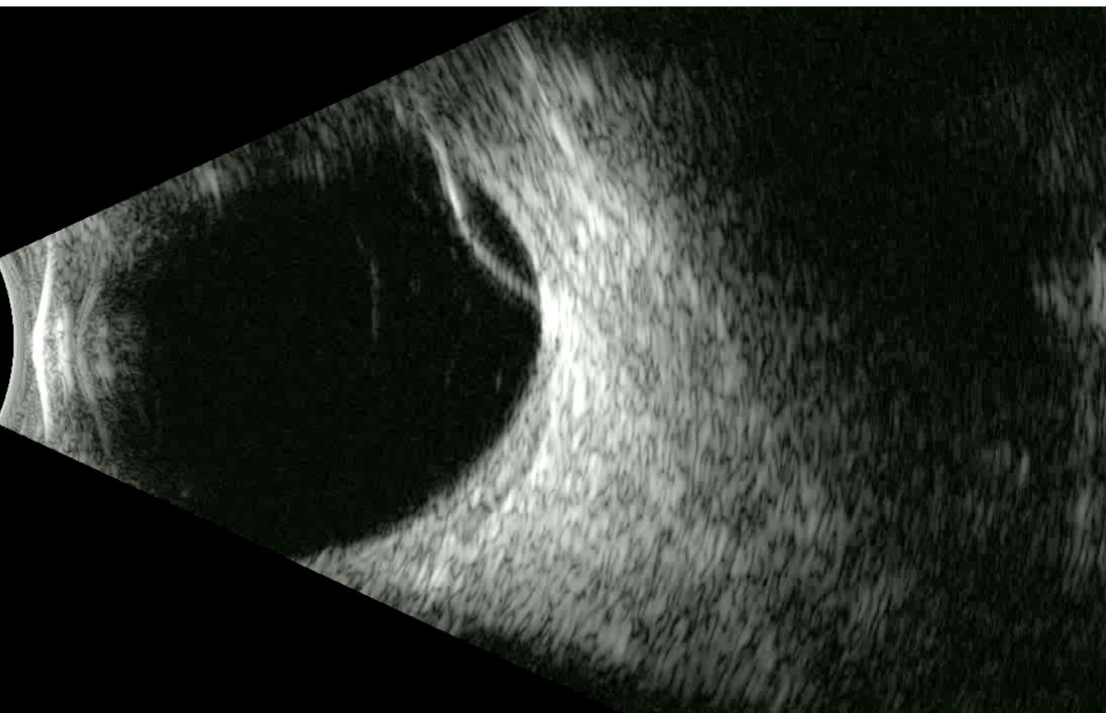
Over 45° F.O.V.

Up to 200° +

Scanning laser ophthalmoscopy (SLO)

True colour





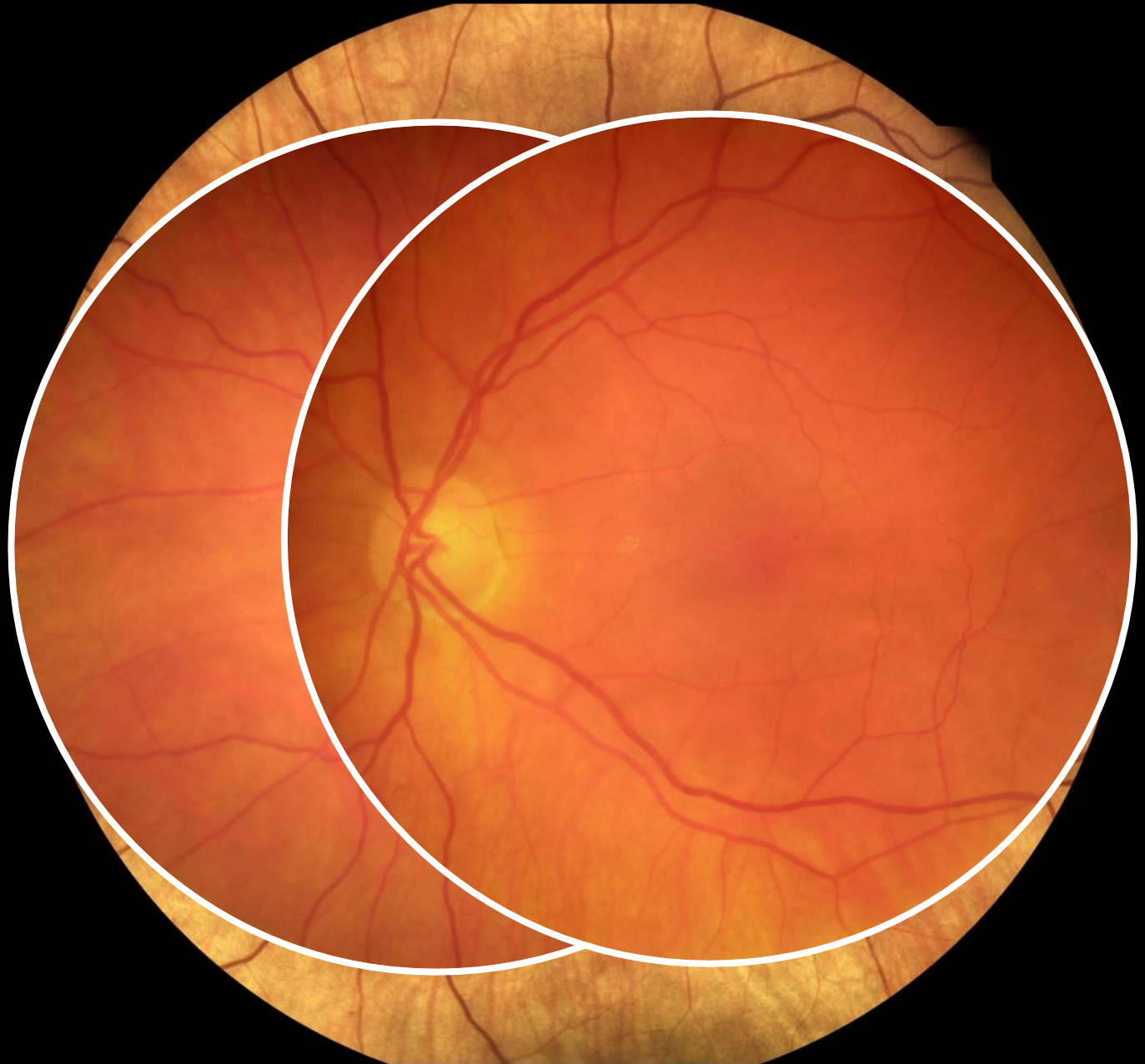
# DR Screening

Single field

Capture 1 x 60° field per

Includes 97% of the current 2 x 45° F.O.V.  
plus additional visible retina ~45%

(combined inferior and superior)





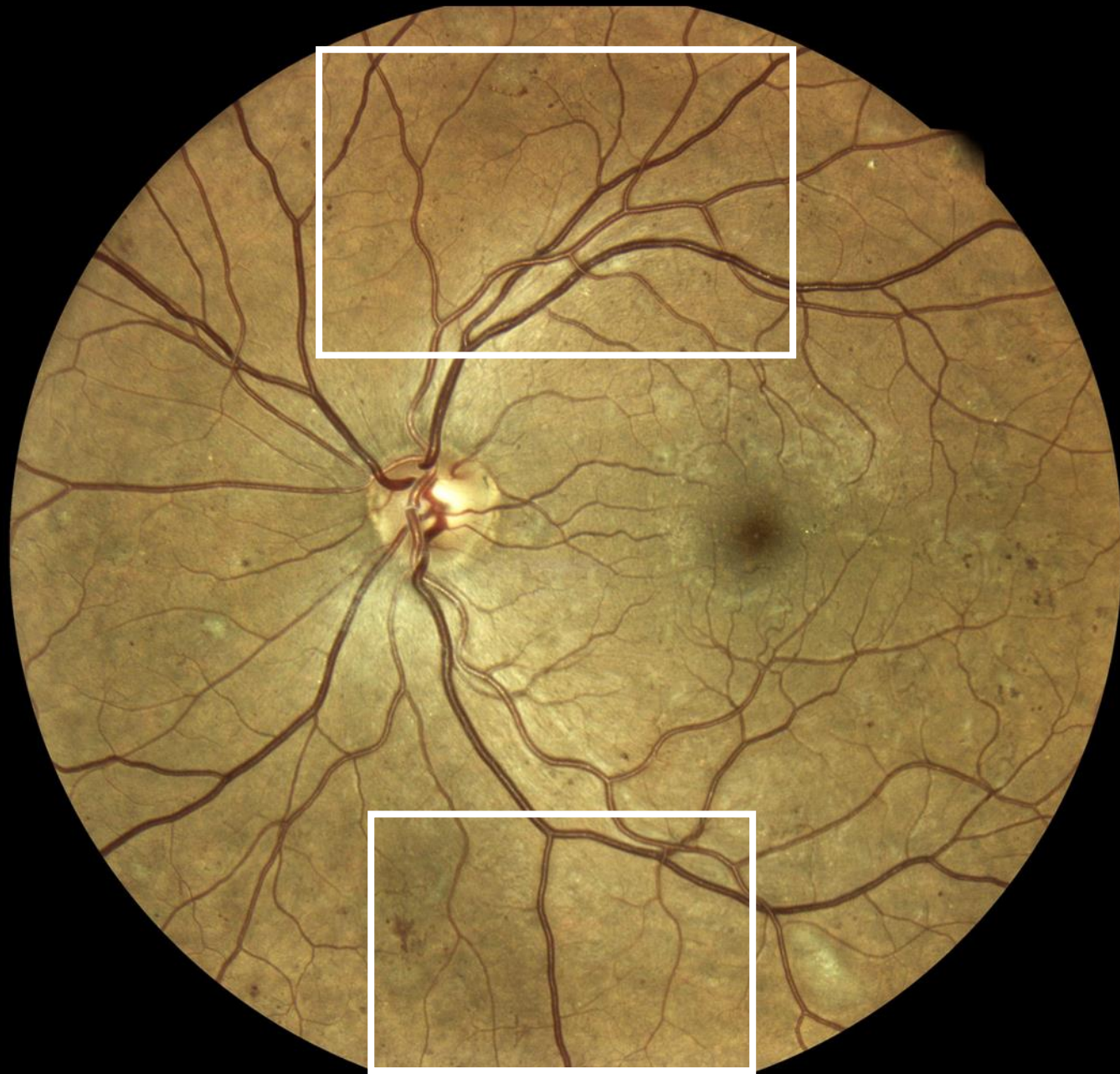
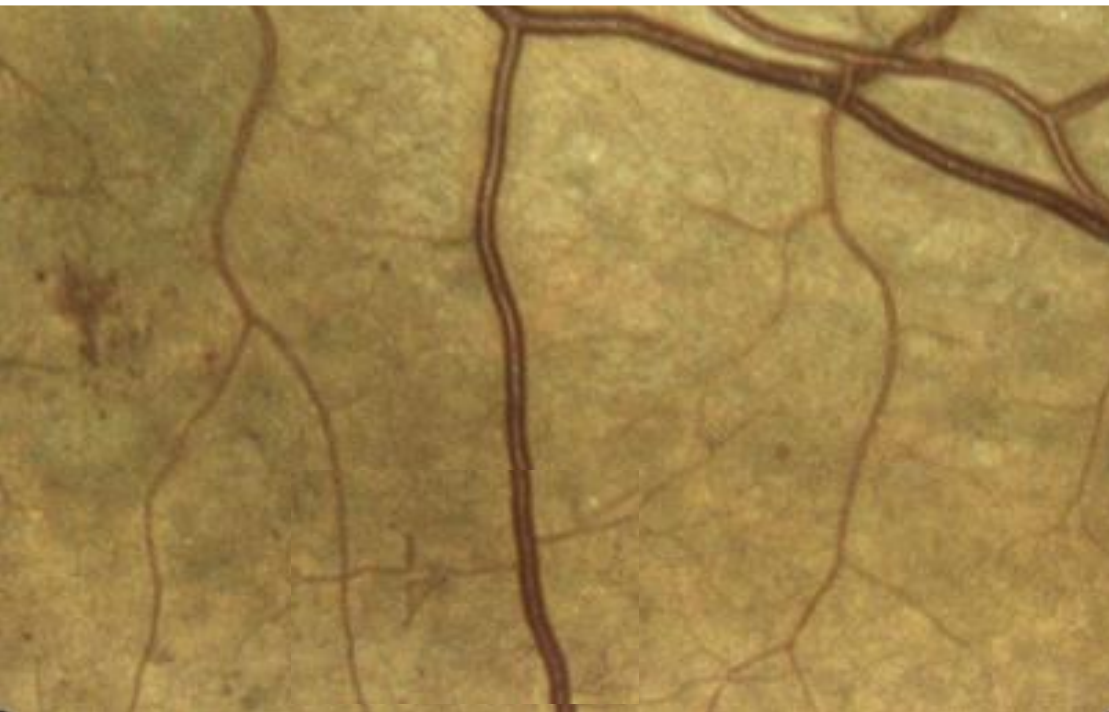
# Other Potential Advantages

Un-dilated?

Red lesion identification (IRMA)







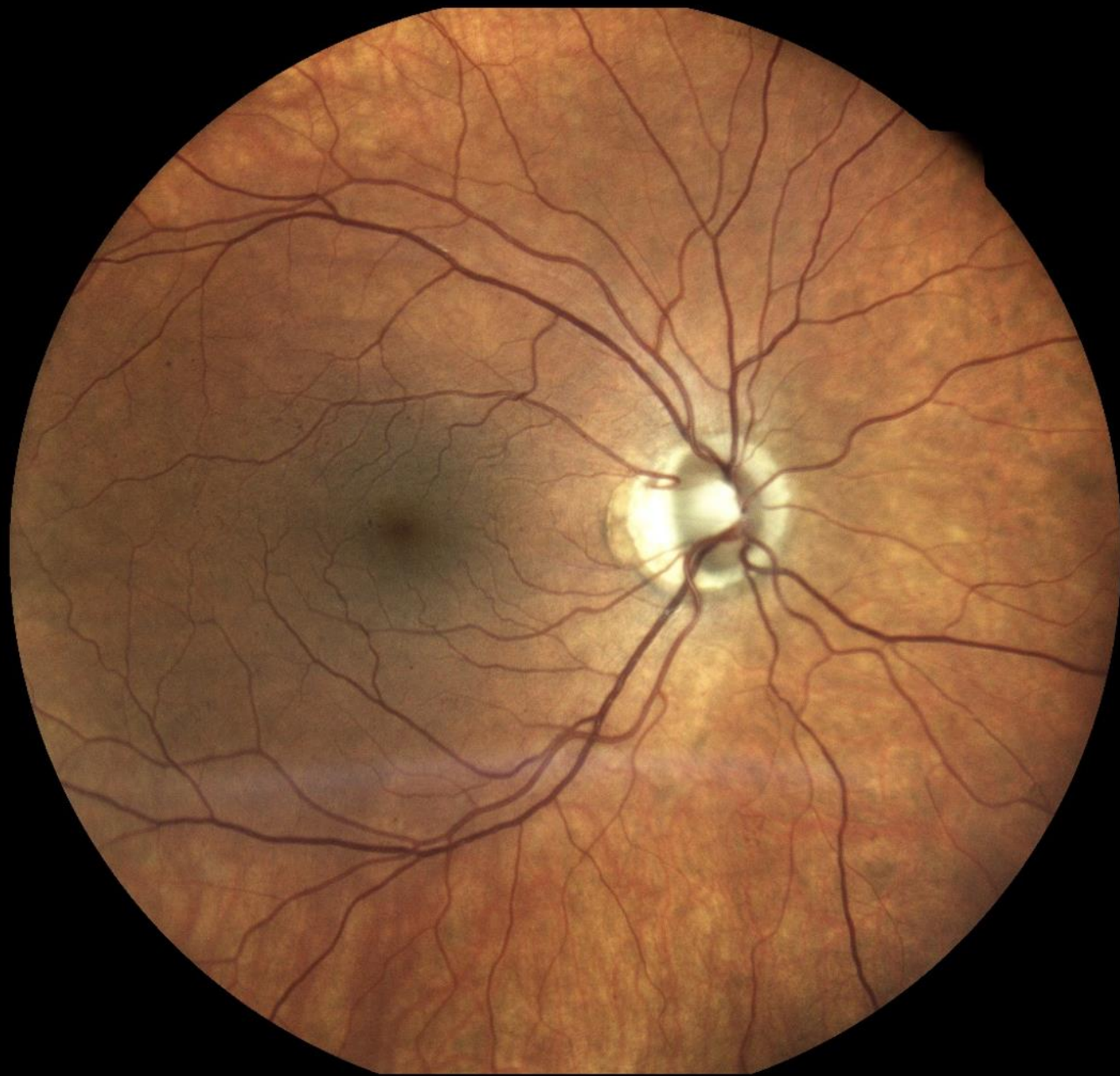
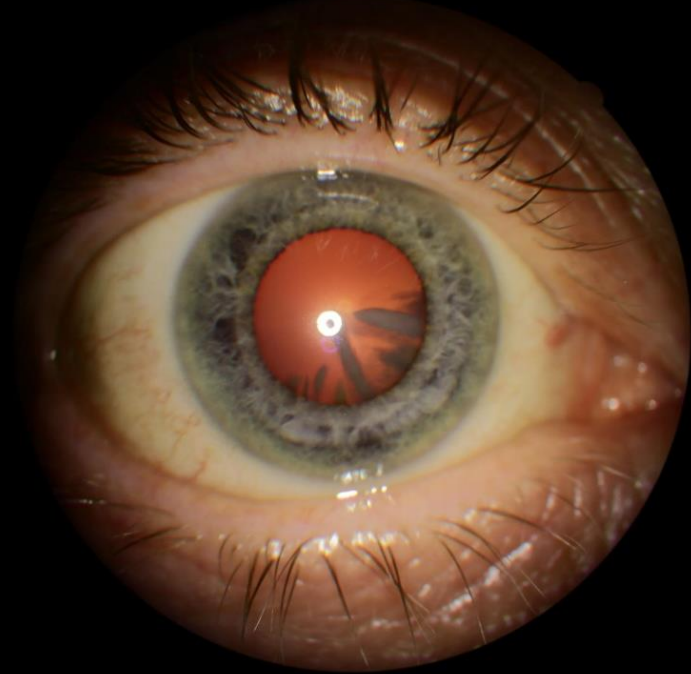
# Other Potential Advantages

Single field

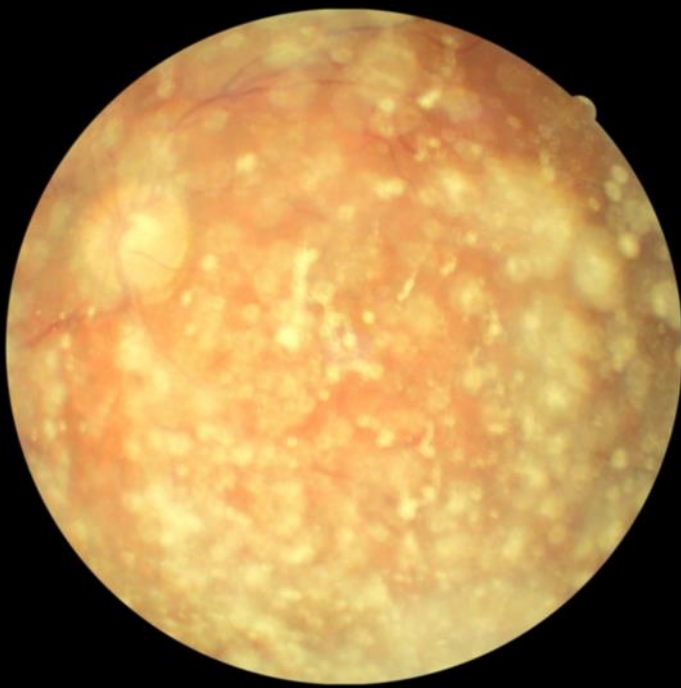
Red lesion (IRMA)

Media opacities

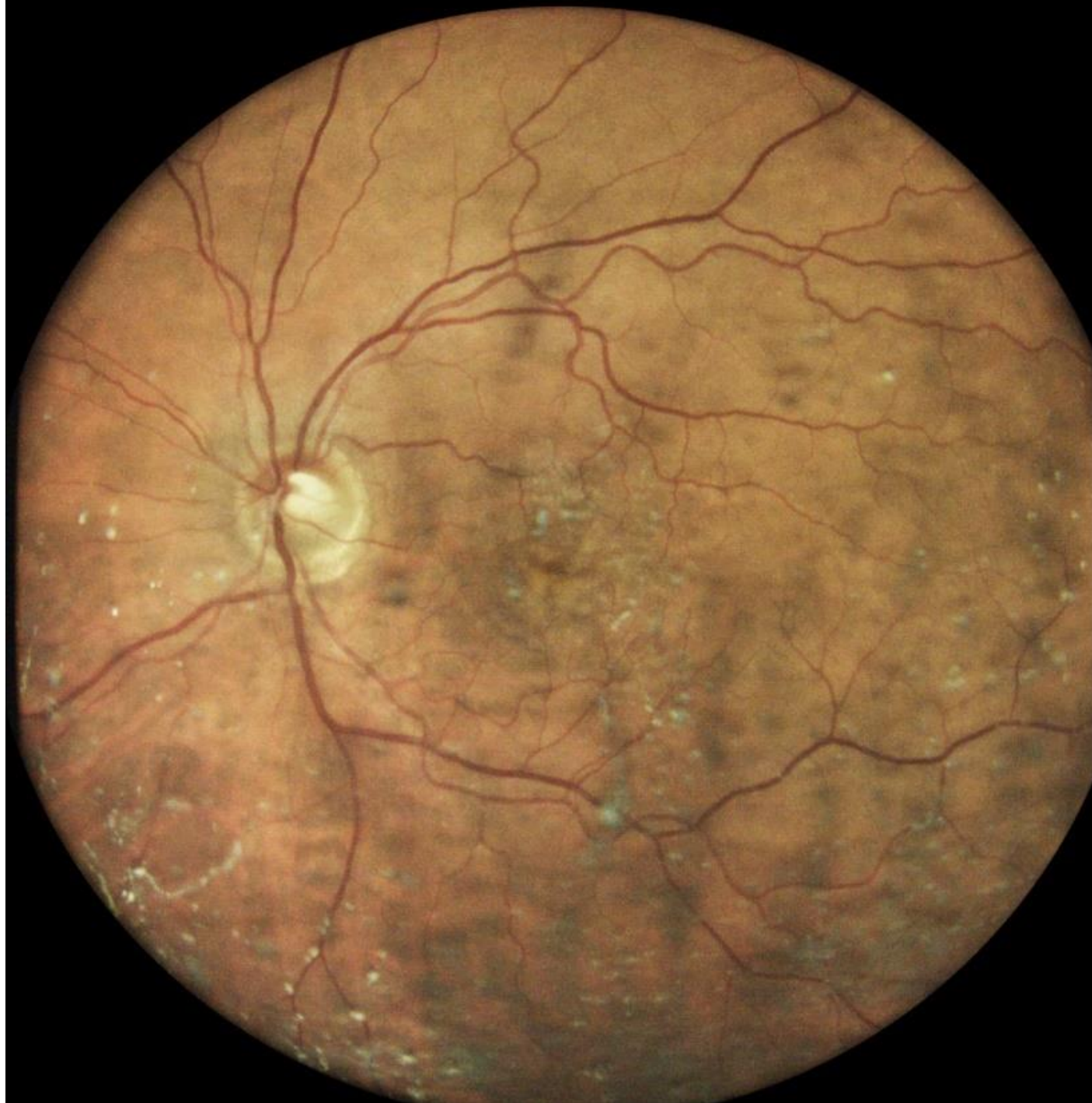








Single field  
Red lesion (IRMA)  
Media opacities  
Vitreous opacities



# DESP Evaluation

# North East London DESP

Waltham Forest Diabetic Eye  
Screening Centre.





1,262 patients recruited between 22  
January and 18 April 2018

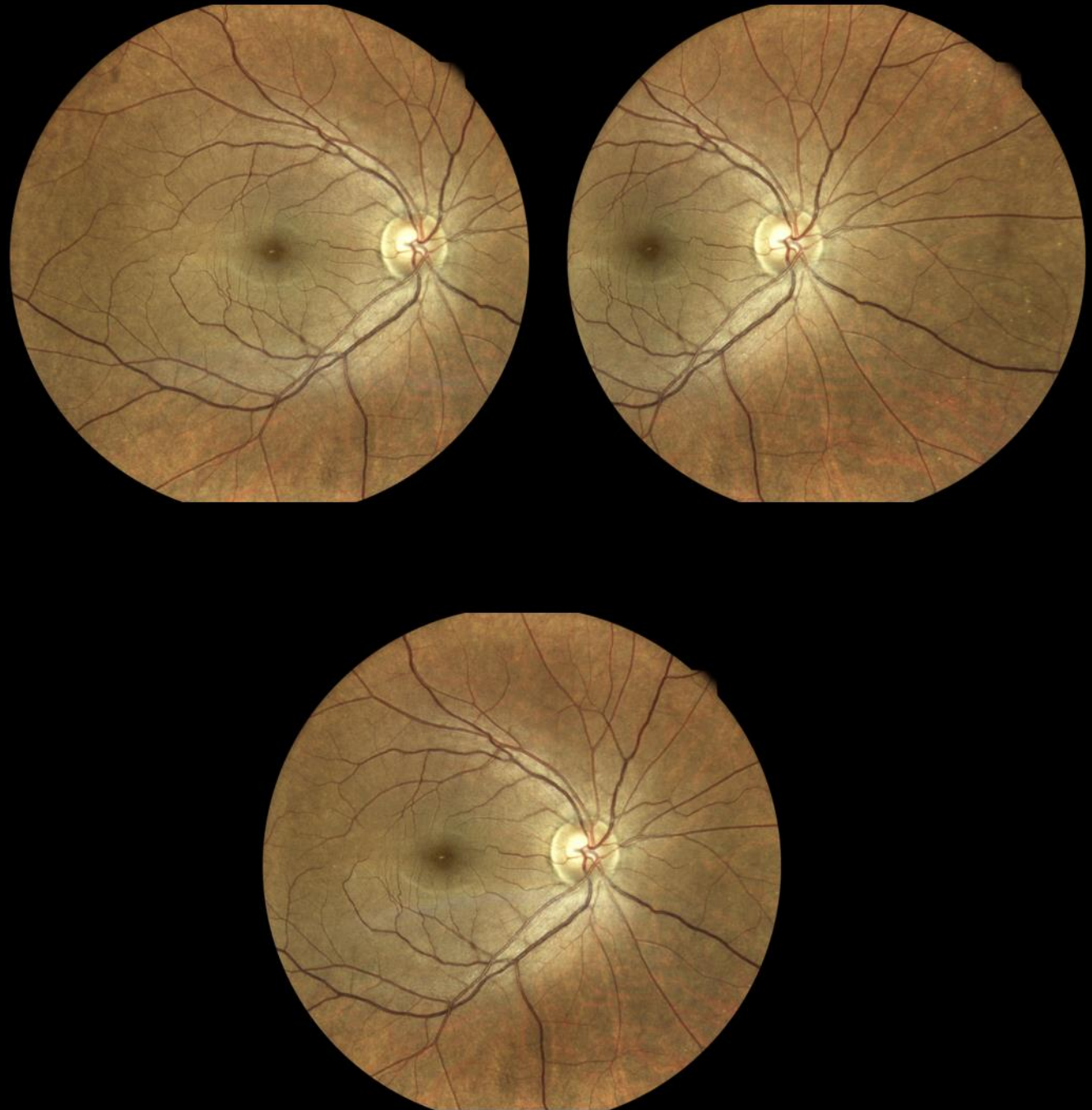
Reported **interim** data based on  
first 337 patients only

Standard 45° fundus photography

Eidon 60° photography

Two field

Single field





	Eidon 2 field	Eidon 1 field	Std photo
R0M0	204 (60.5%)	207 (61.4%)	232 (68.8%)
R1M0	106 (31.4%)	99 (29.4%)	81 (24.0%)
R1M1	8 (2.4%)	8 (2.4%)	12 (3.6%)
R2M0	5 (1.5%)	4 (1.2%)	4 (1.2%)
R2M1	3 (0.9%)	3 (0.9%)	2 (0.6%)
R3sM0	1 (0.3%)	1 (0.3%)	0 (0.0%)
R3sM1	0 (0.0%)	0 (0.0%)	1 (0.3%)
R3aM0	0 (0.0%)	0 (0.0%)	0 (0.0%)
R3aM1	2 (0.6%)	2 (0.6%)	2 (0.6%)
U	8 (2.4%)	13 (3.8%)	3 (0.9%)

Study ID number:

Right eye

Left eye

Visual acuity

Maculopathy

☐ M0

Any microaneurysm or haemorrhage within 1DD of the fovea associated with a best VA of  $\leq 6/12$  where the cause is known and is not diabetic maculopathy

☐ M1

Exudate within 1 disc diameter (DD) of the fovea

Group of exudates within 1DD of the centre of the macula

Retinal thickening within 1DD of the centre of the macula

Any microaneurysm or haemorrhage within 1DD of the fovea associated with a best VA of  $\leq 6/12$

NO DIABETIC MACULOPATHY

No maculopathy

REFERABLE DM

Photocoagulation

☐ P0

No evidence of previous photocoagulation

☐ P1

Focal/grid to macula or periphery

NO PHOTOCOAGULATION

PHOTOCOAGULATION

Outcome

Comments:

Image quality

Retinopathy

☐ R0

No DR

☐ R1

BACKGROUND DR

Microaneurysm(s)

Retinal haemorrhage(s)

Venous loop

Any exudate in the presence of other features of DR

Any number of cotton wool spots (CWS) in the presence of other features of DR

☐ R2

PRE-PROLIFERATIVE DR

Venous beading

Venous reduplication

Multiple blot haemorrhages

Intraretinal microvascular abnormality (IRMA)

☐ R3S

STABLE POST TREATMENT PROLIFERATIVE DR

Stable fibrous proliferation (disc or elsewhere)

Stable R2 features (from feature based grading) + peripheral retinal scatter laser

R1 features (from feature based grading)

☐ R3A

ACTIVE PROLIFERATIVE DR

New vessels on disc (NVD)

New vessels elsewhere (NVE)

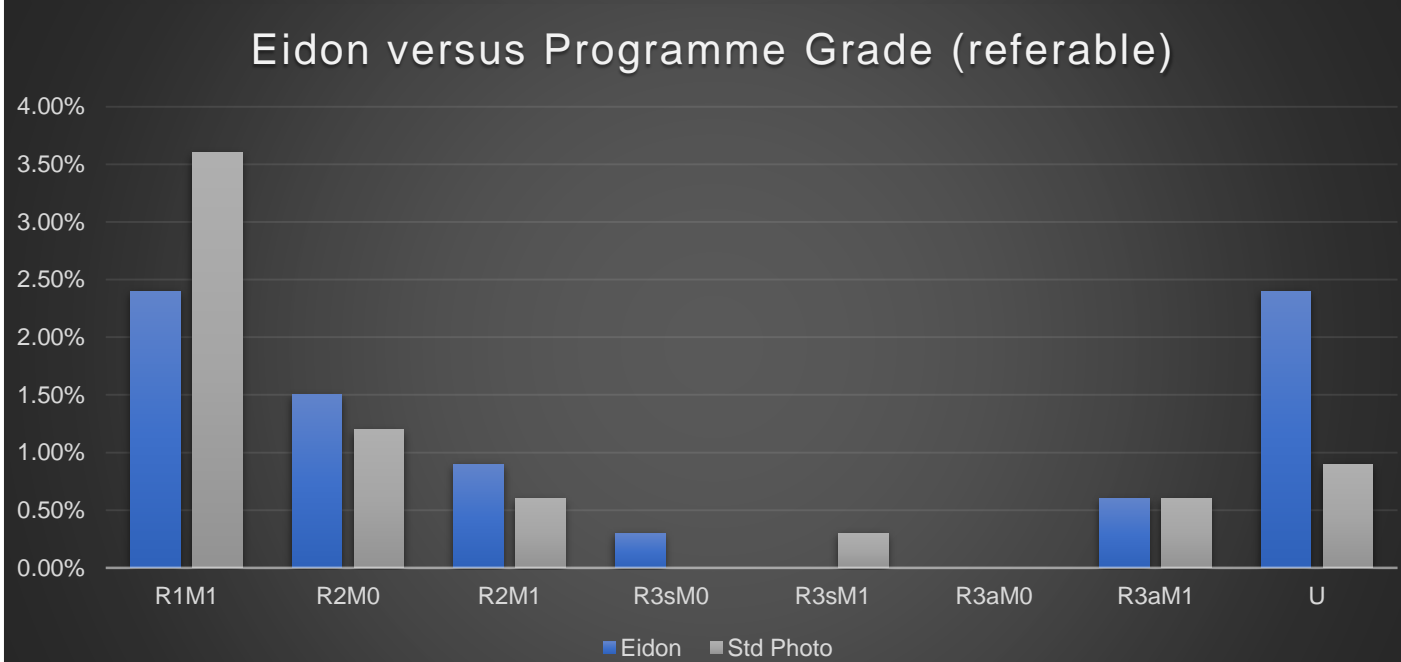
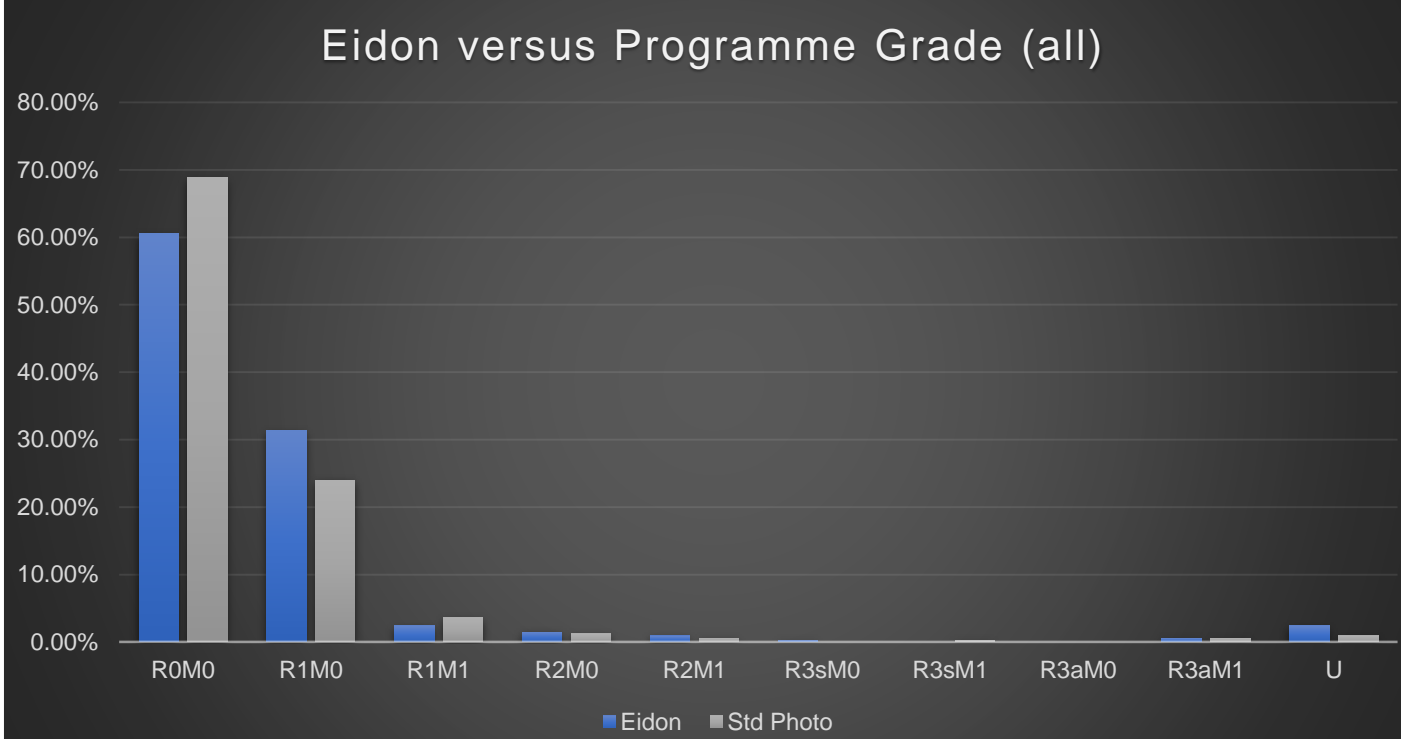
New pre-retinal or vitreous haemorrhage

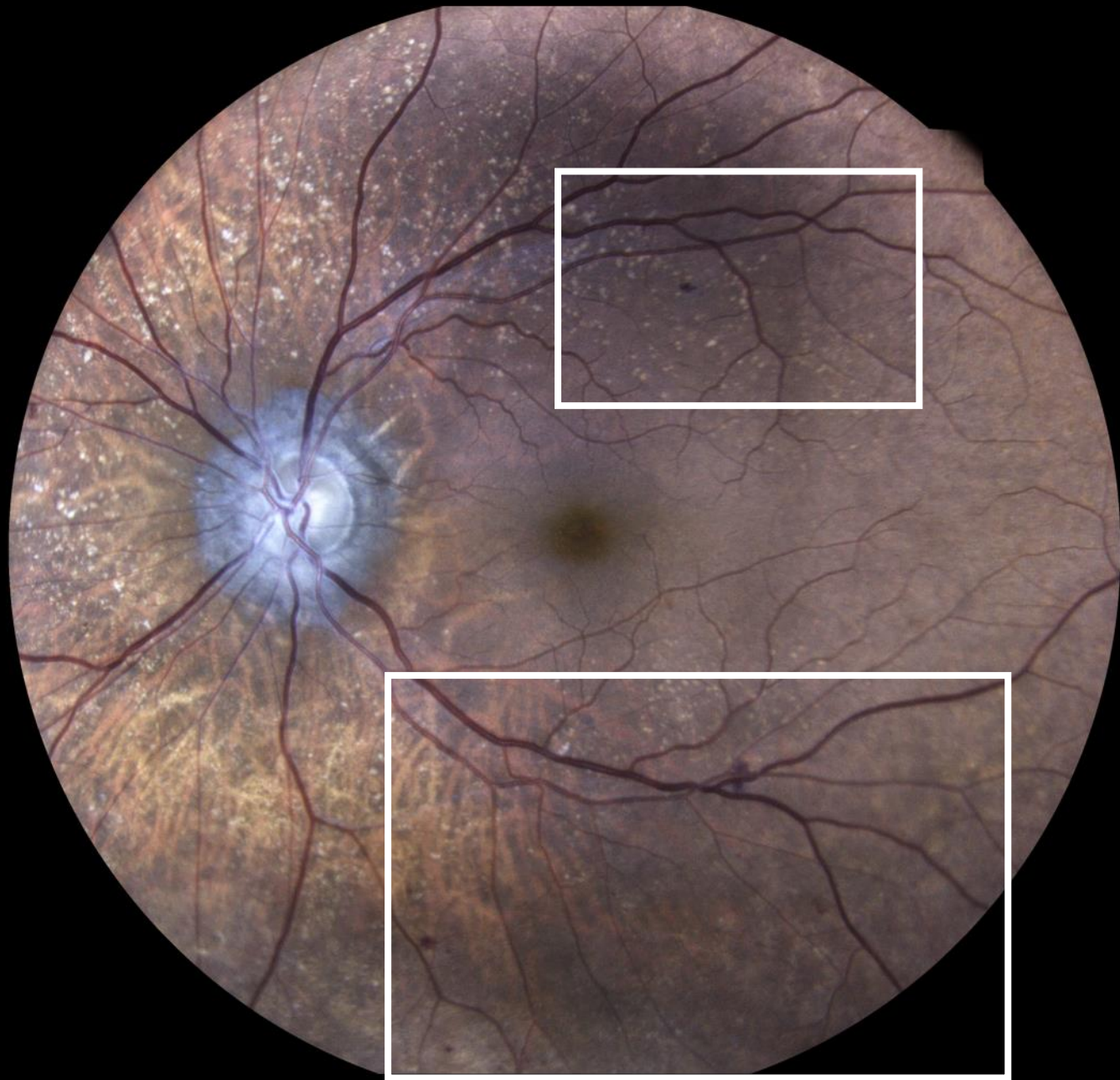
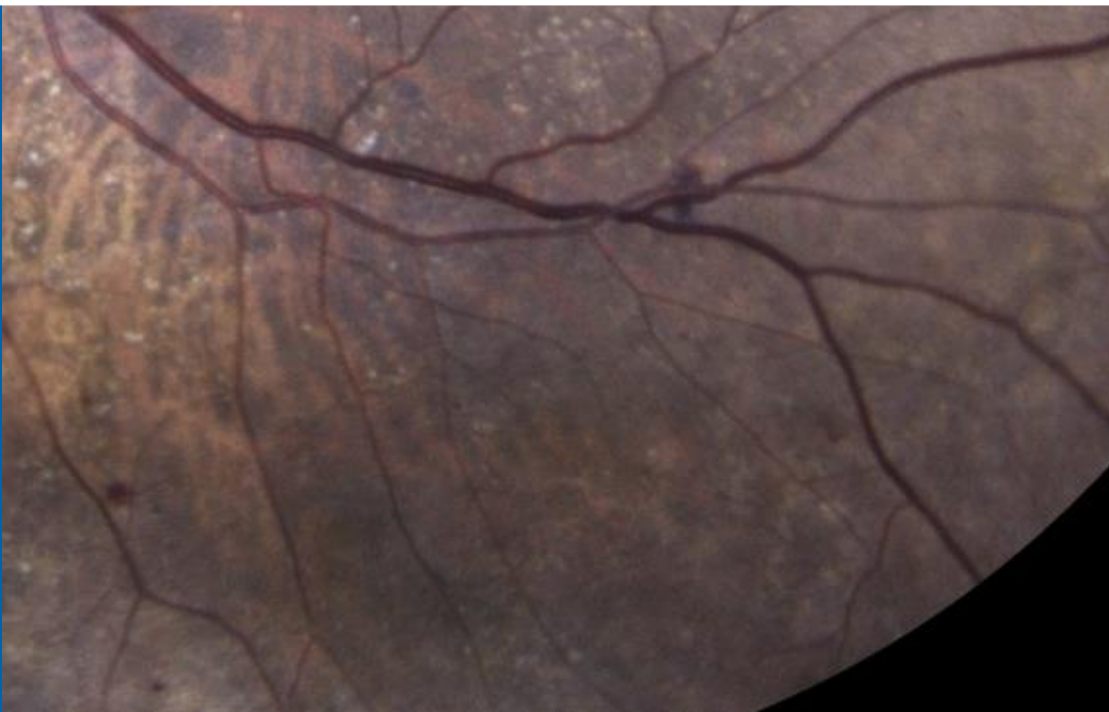
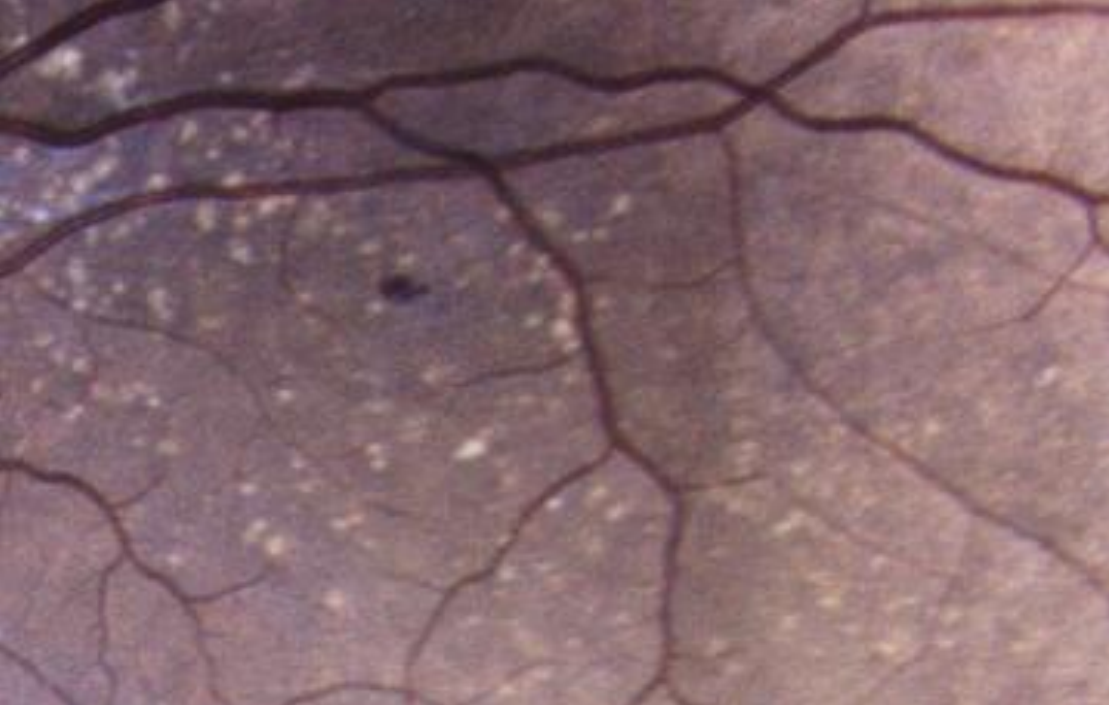
New pre-retinal fibrosis

New tractional retinal detachment

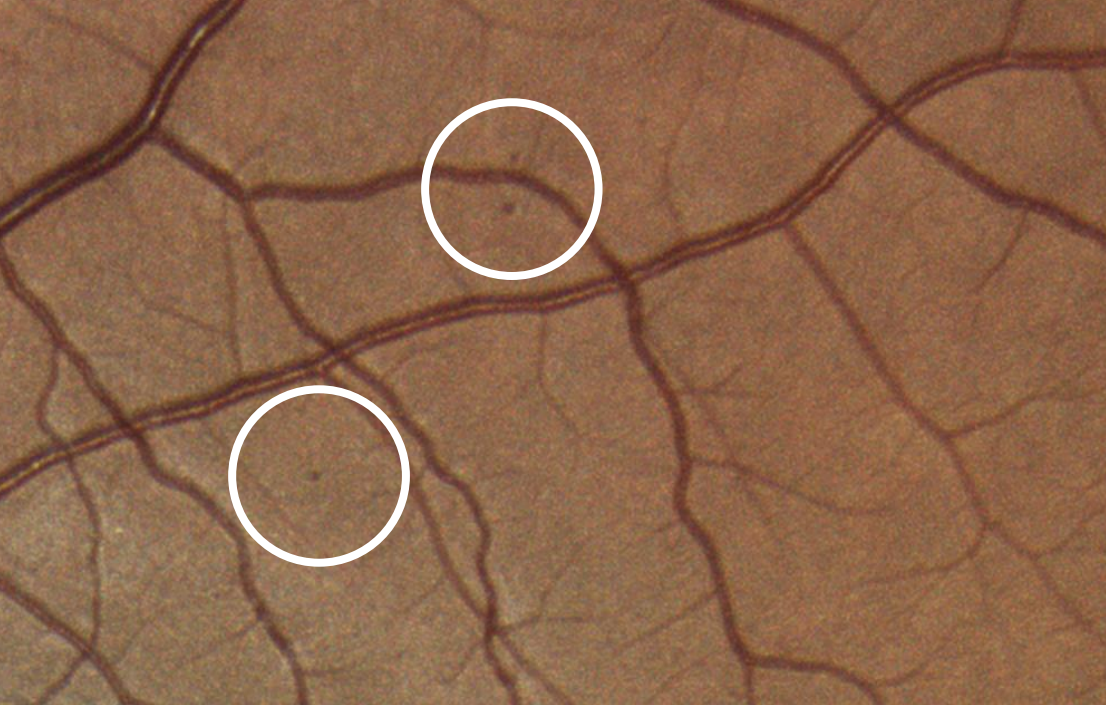
Reactivation in a previous stable R3S eye

	Eidon 2 field	Eidon 1 field	Std photo
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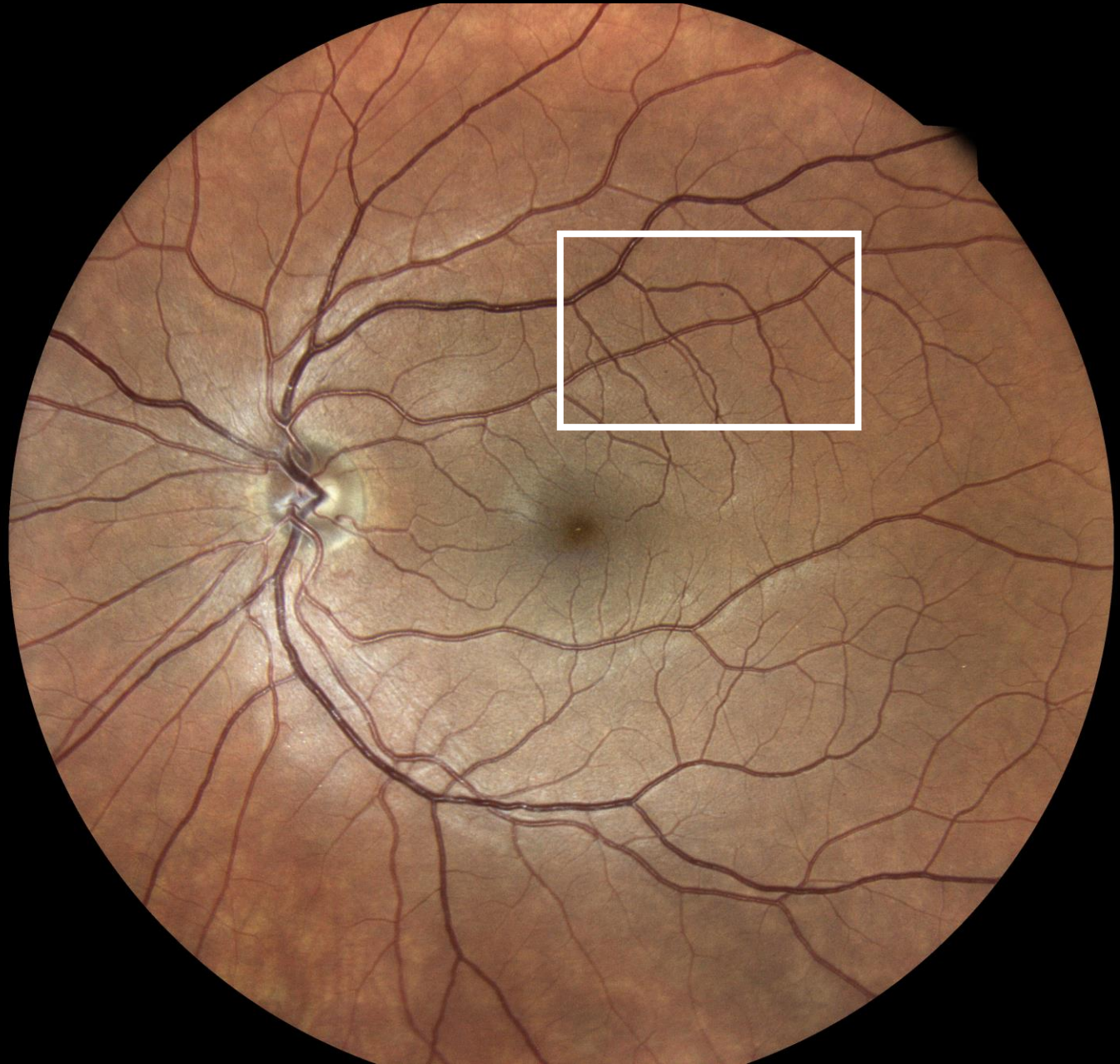




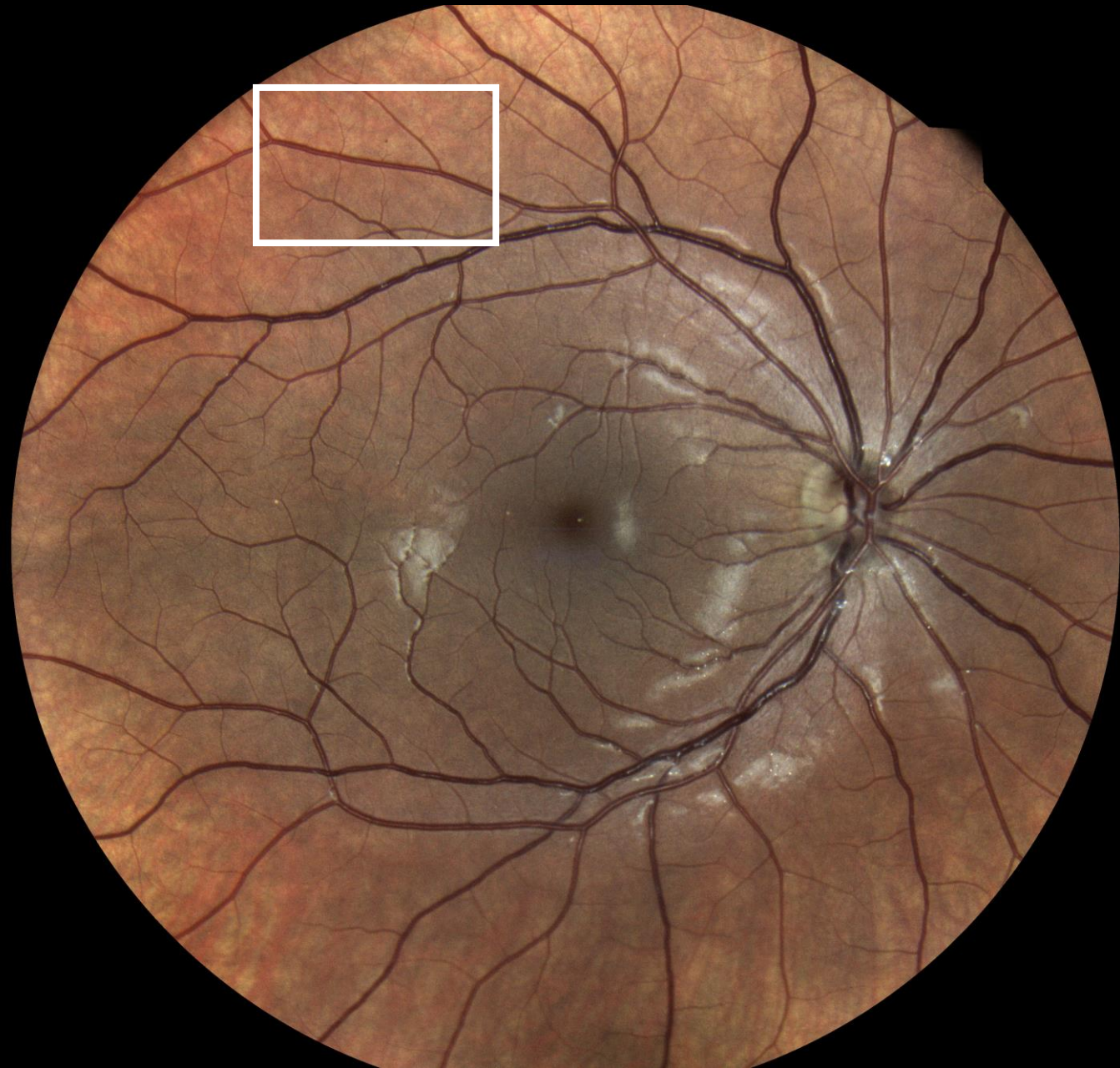
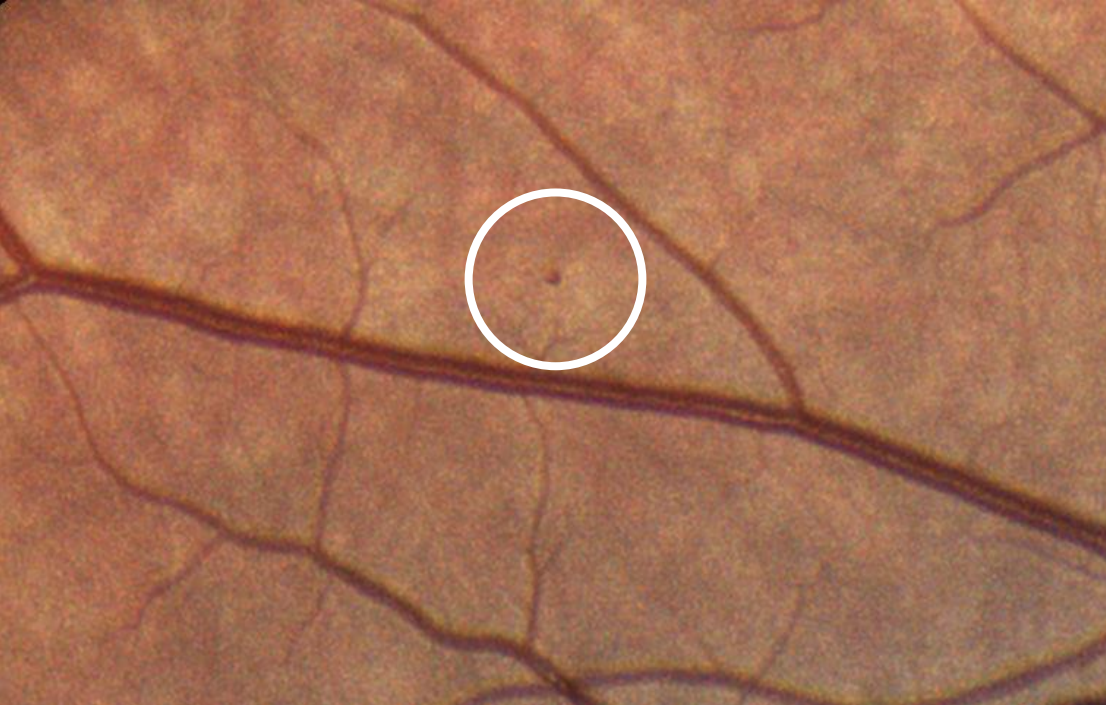




R1M0 versus R0M0

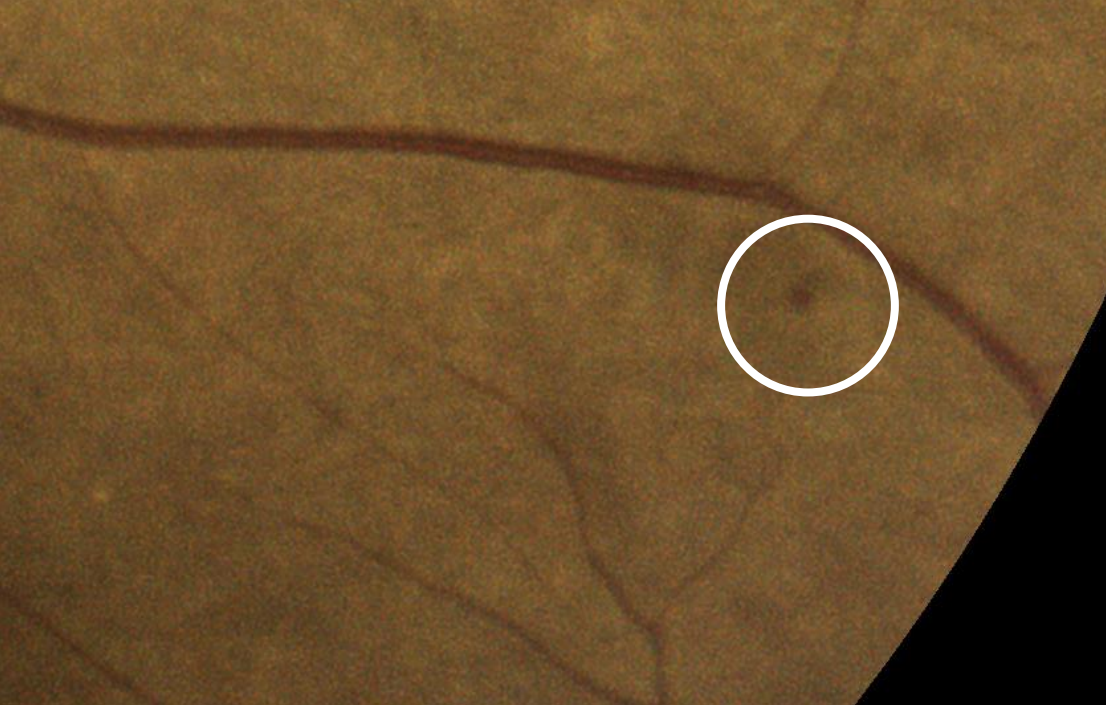




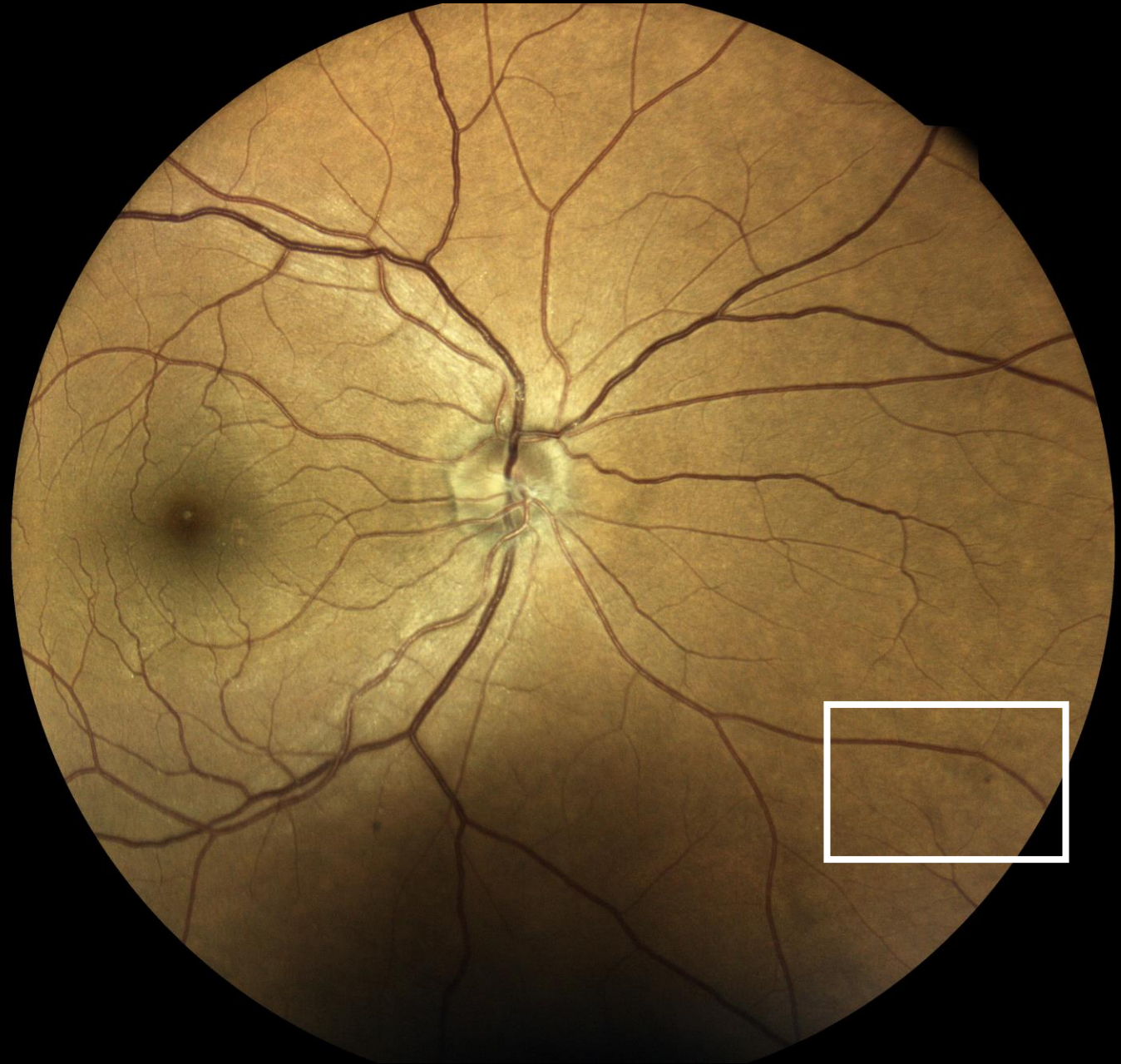


R1M0 versus R0M0

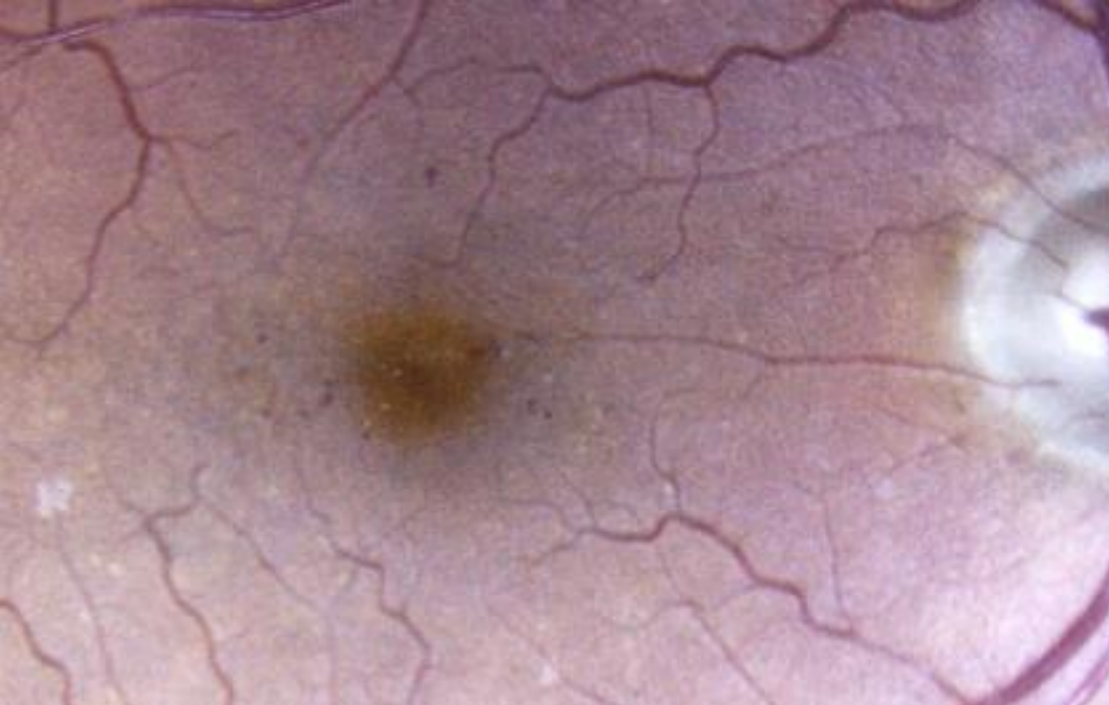




R1M0 versus R0M0







“Missed M1”

VA 6/6





“Missed M1”

VA 6/12

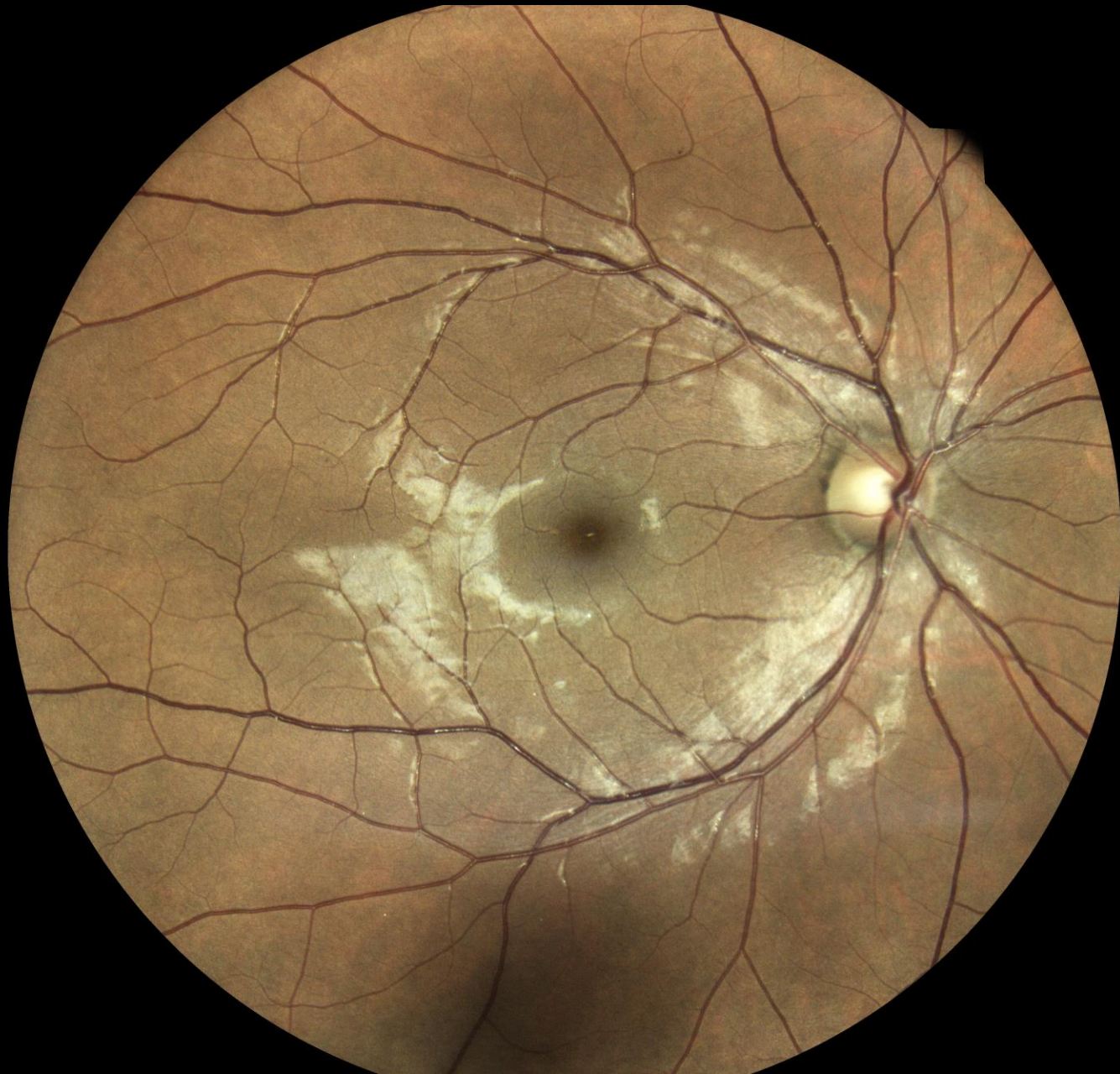






“Missed M1”

VA 6/6

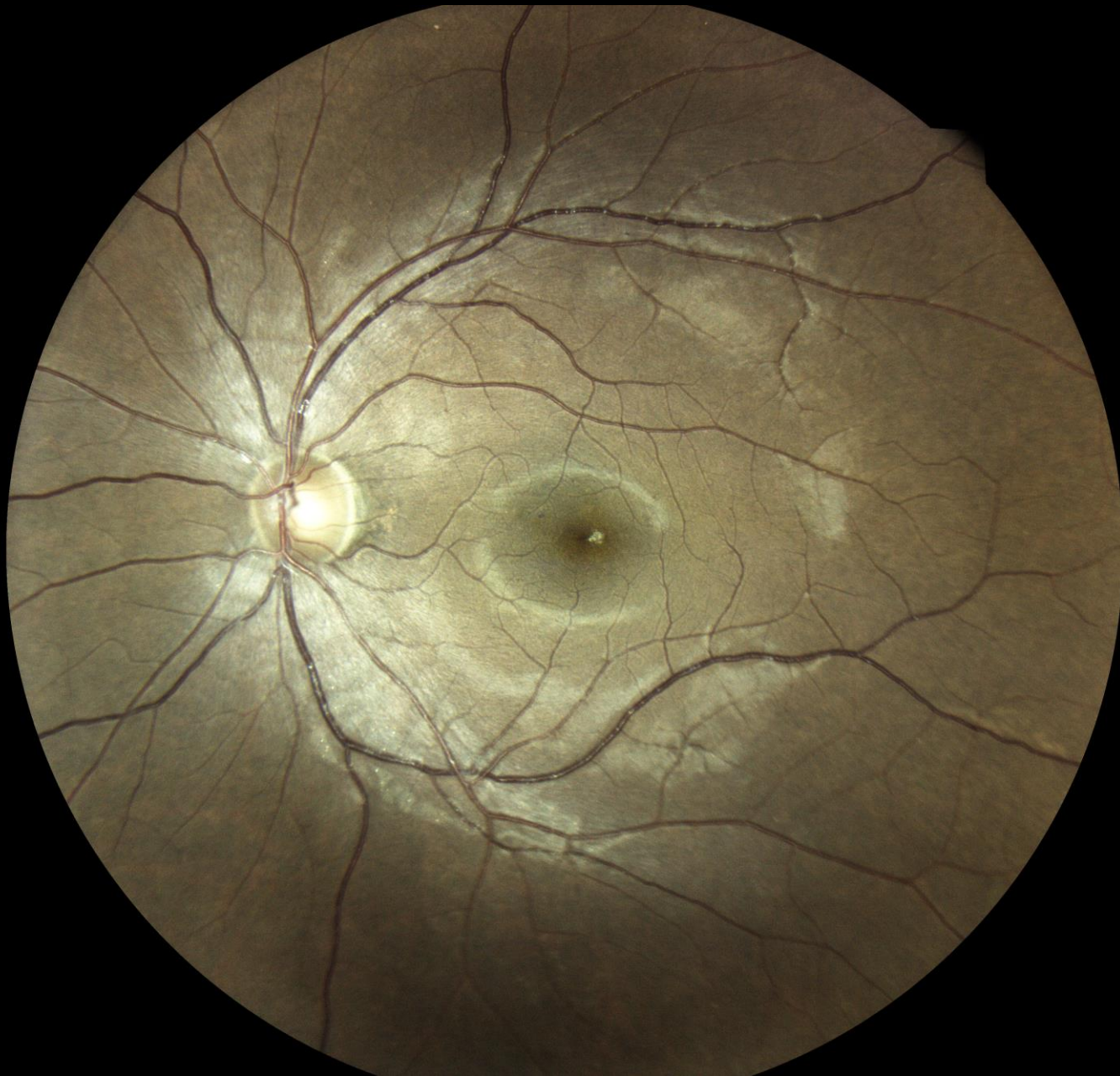






“Missed M1”

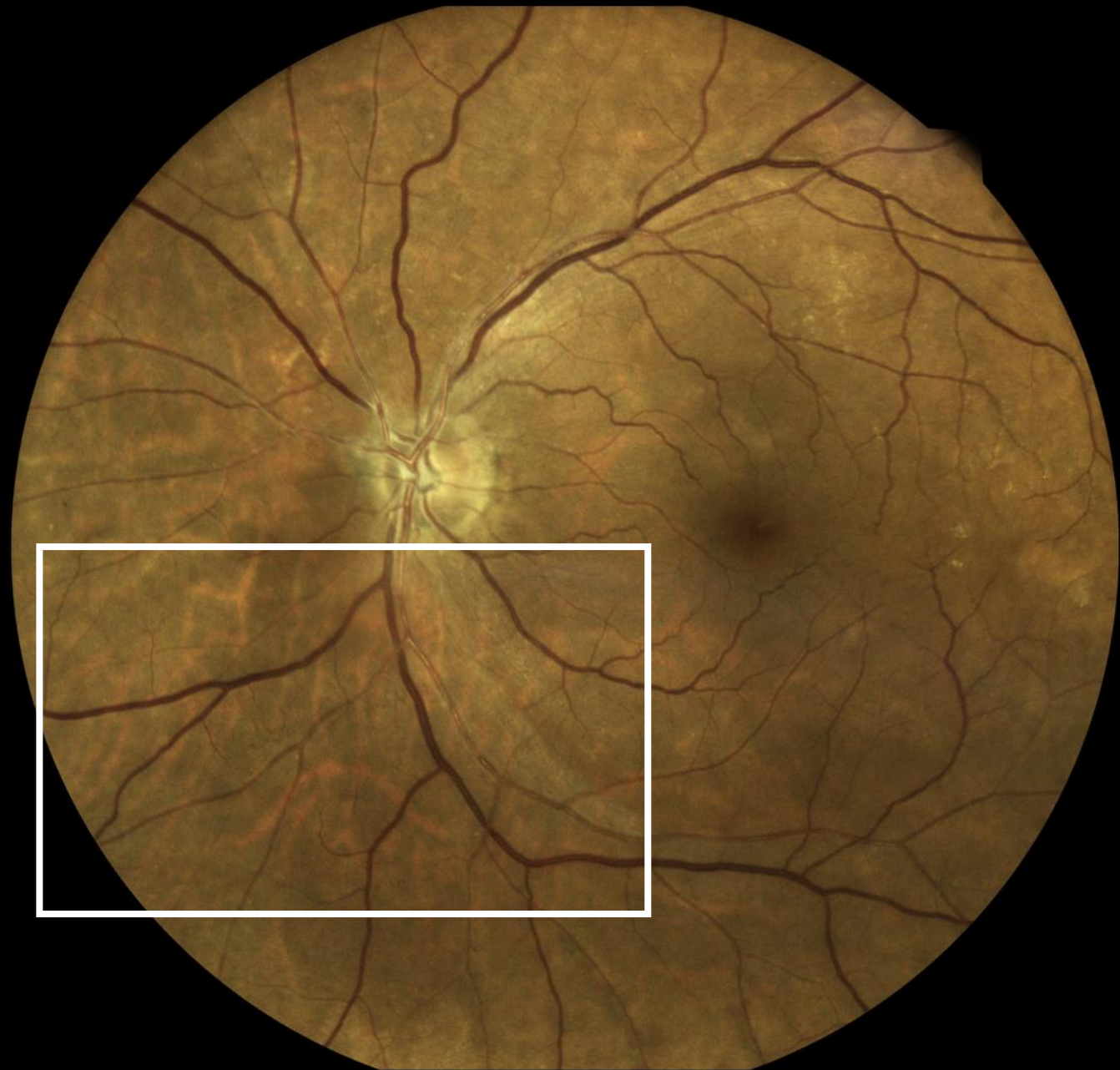
VA 6/6  
 Grade 1 note - Pale edged red lesion in macula  
 ?M1



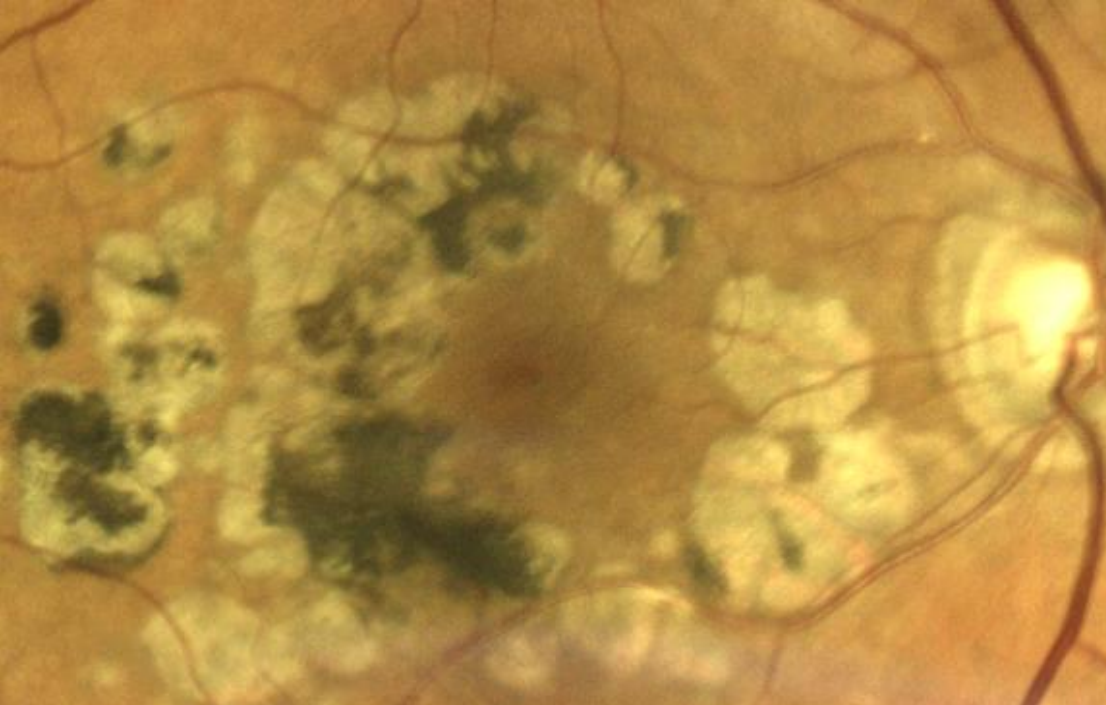




“Missed R2”







“Missed R3sM1”

VA 6/12  
Grade 1 note - Query sprouting new vessels





“Missed R3sM1”

Grader note - Query sprouting new vessels



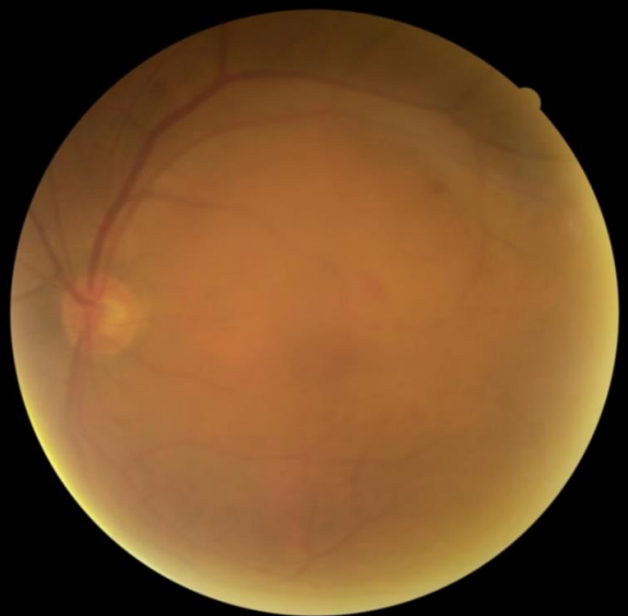
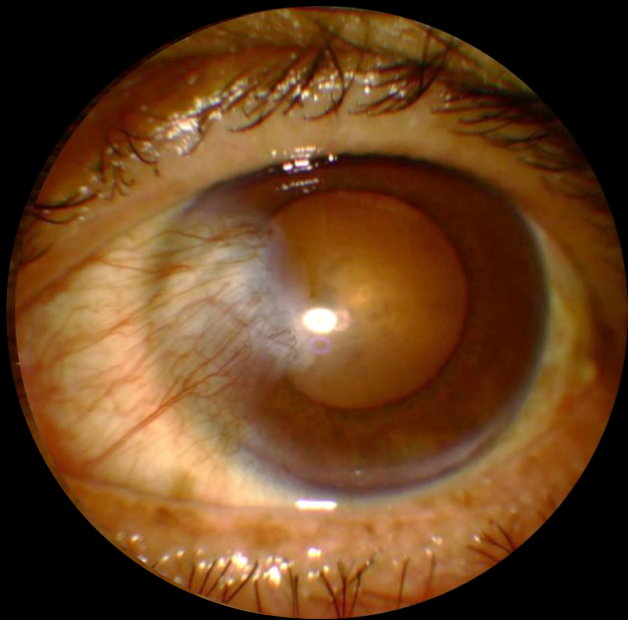


# Discrepancies

Ungradeables













# Conclusions

More R1M0 (7.4%) and fewer R0M0 (8%) with Eidon compared with standard photography

Similar levels of referable DR detected using both Eidon and standard photography

No urgent referrals missed with Eidon

Less U cases due to cataract with Eidon

Good red lesion (IRMA) detection with Eidon

Screeners reported some difficulty screening elderly, infirm and non English speakers

Tablet requires overnight charge

# Next steps

Analysis of full data set 1,262 patients  
and arbitration of discrepancies.

Independent re-grade of Eidon images.

HTA 17/133 Research Call:

*“What is the potential role for scanning confocal  
ophthalmoscopy in diabetic eye screening? How  
does it affect the detection of retinopathy and  
would its use be cost-effective?”*



# Thank you

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Any questions?