

Diabetic and the Eye: An Introduction

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Background

- **Diabetes mellitus (DM)** affects 422 millions of people in the world¹
- **Diabetic retinopathy (DR)** causes 1.9% of moderate-to-severe visual impairment and 2.6% of blindness¹

¹ World Health Organization.
Global report on diabetes. 2016.

How common is **diabetic retinopathy**?

Among individuals with DM:

- 30-35% has diabetic retinopathy^{1,2}
- 5-10% has vision-threatening diabetic retinopathy²

Life-time risk of diabetic retinopathy:

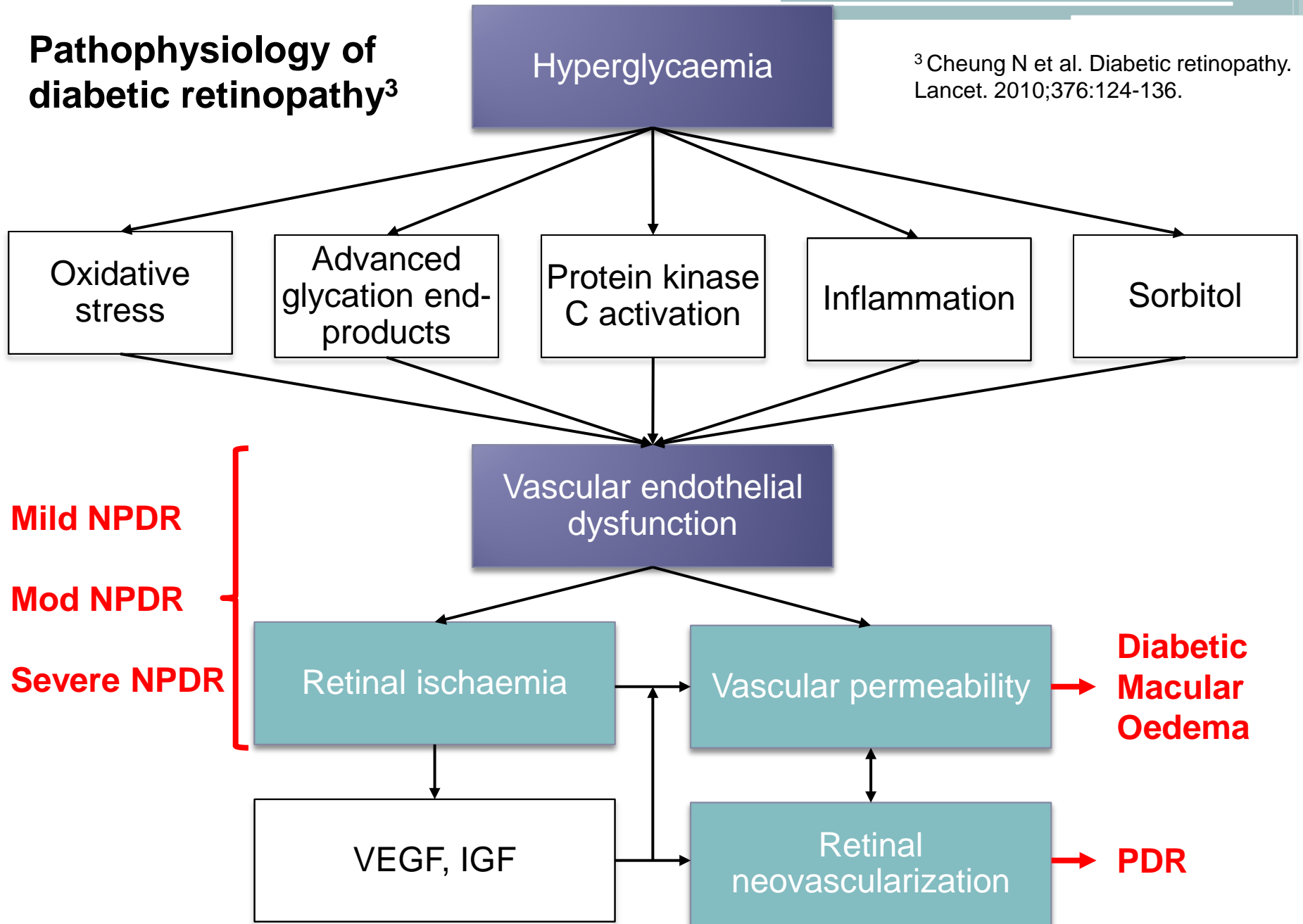
- 50-60% in type 2 DM²
- 90% in type 1 DM²

¹ World Health Organization. Global report on diabetes. 2016.

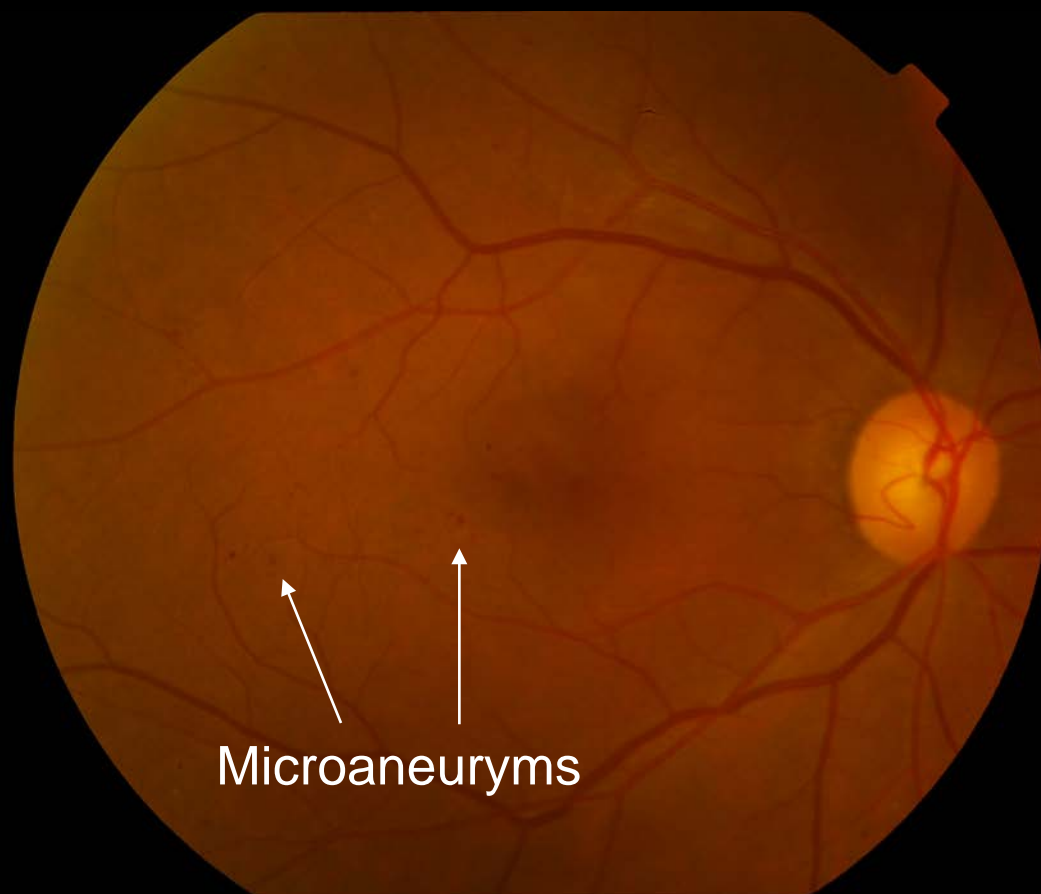
² Wong TY et al. Diabetic retinopathy. Nature Reviews Disease Primers. 2016;2:16012.

Pathophysiology of diabetic retinopathy³

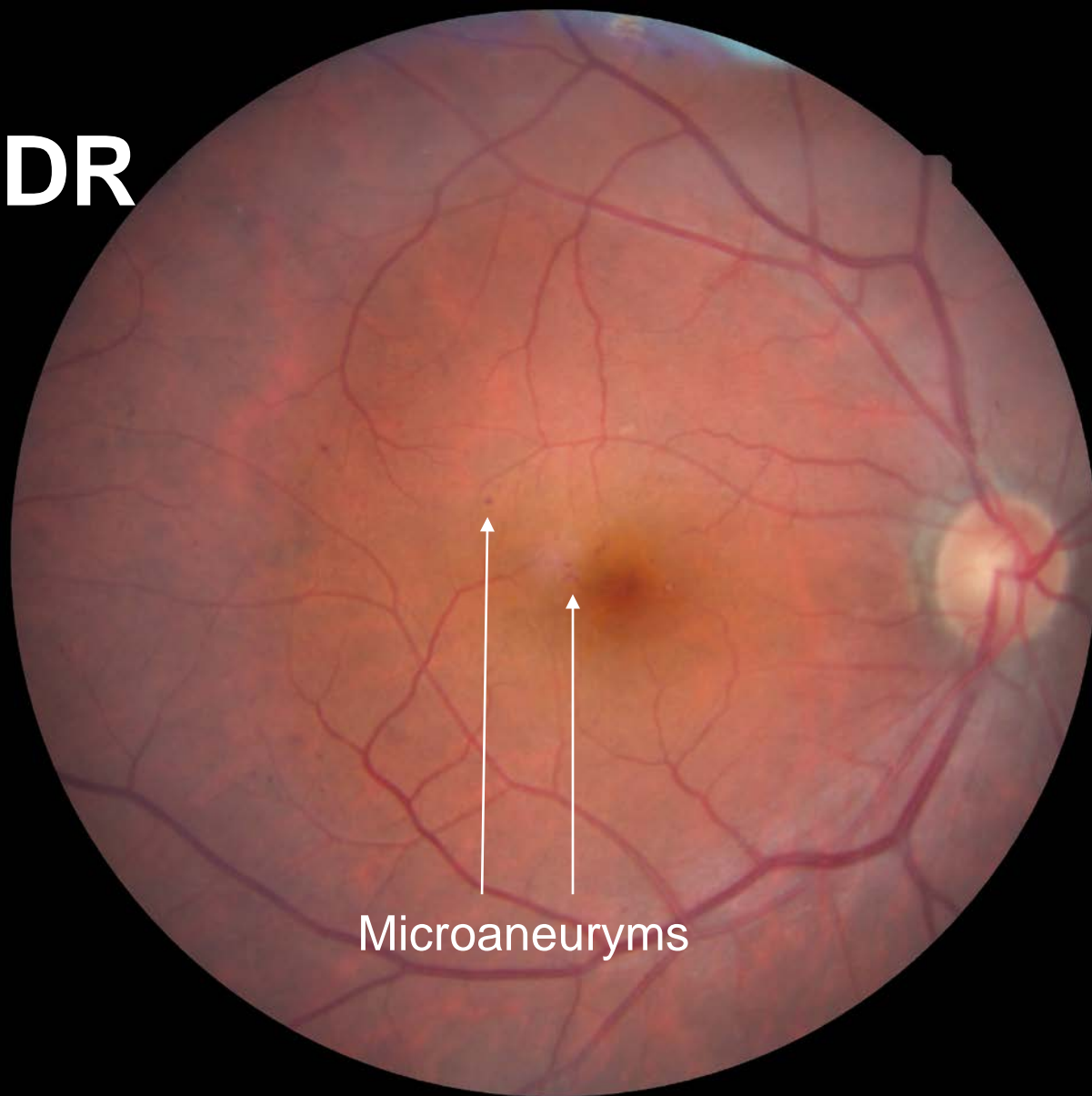
³Cheung N et al. Diabetic retinopathy. Lancet. 2010;376:124-136.



Mild NPDR



Mild NPDR



Microaneurysms

Mild NPDR

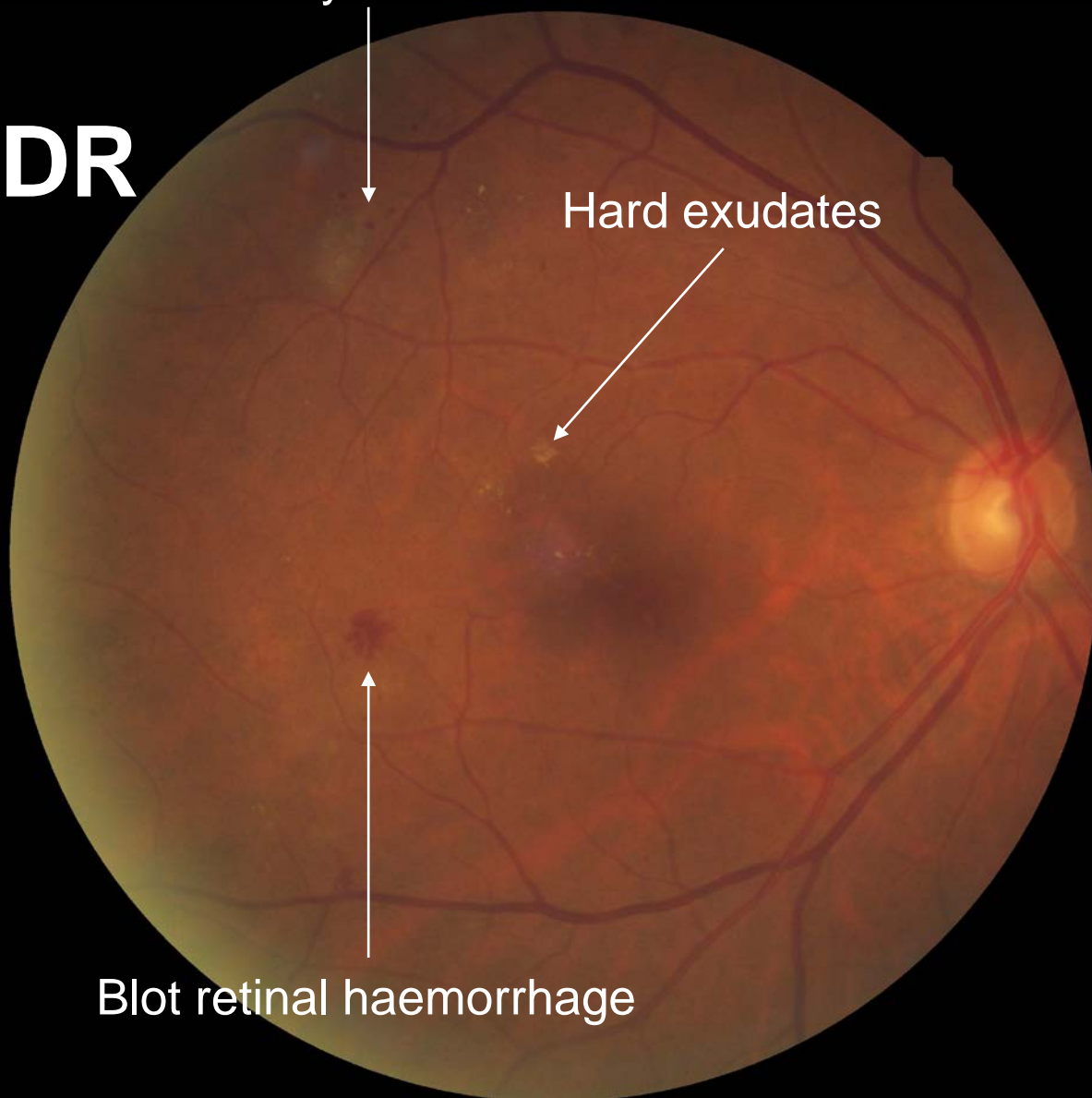
Dot retinal haemorrhage /
microaneurysm



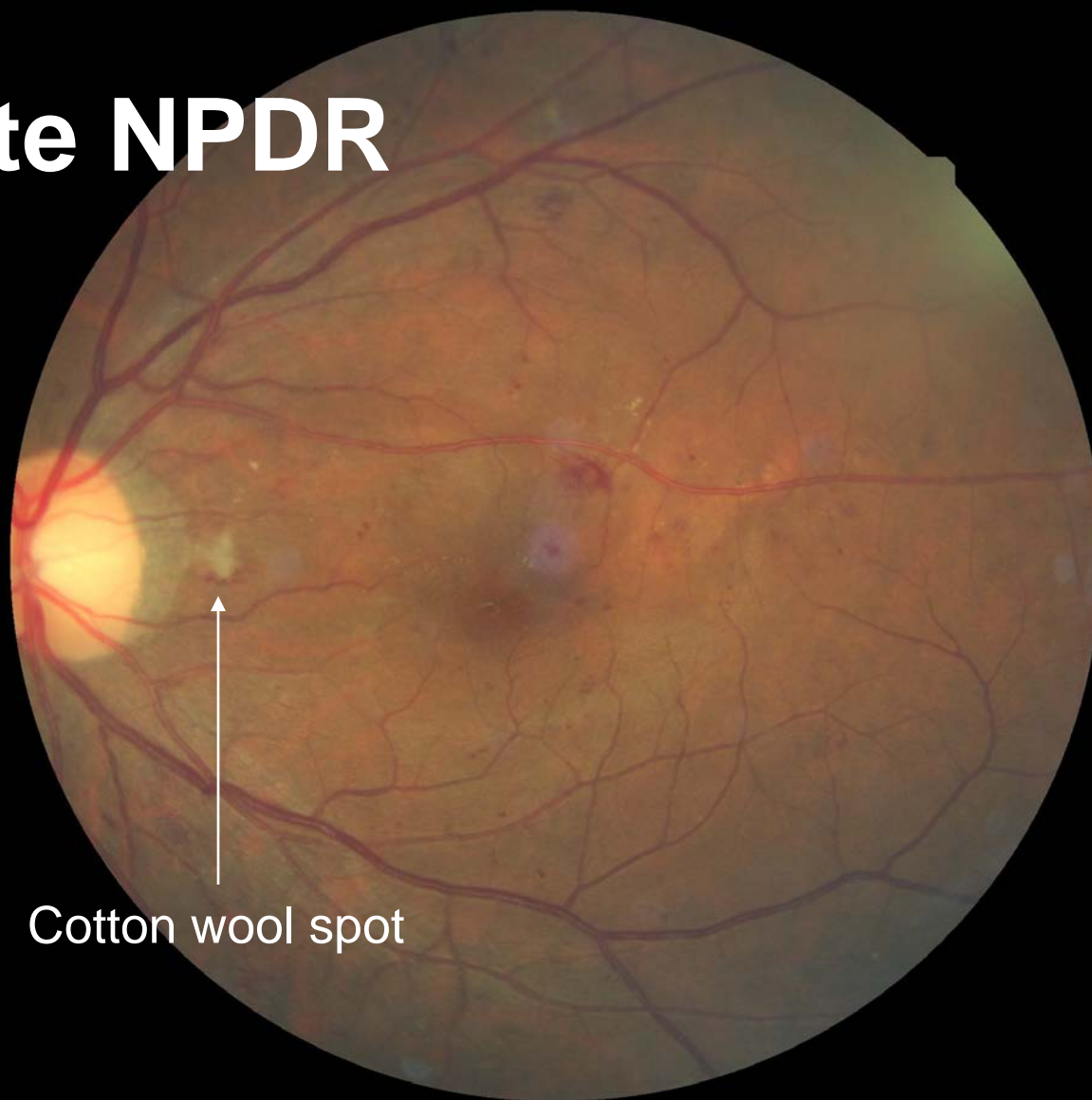
Hard exudates



Blot retinal haemorrhage



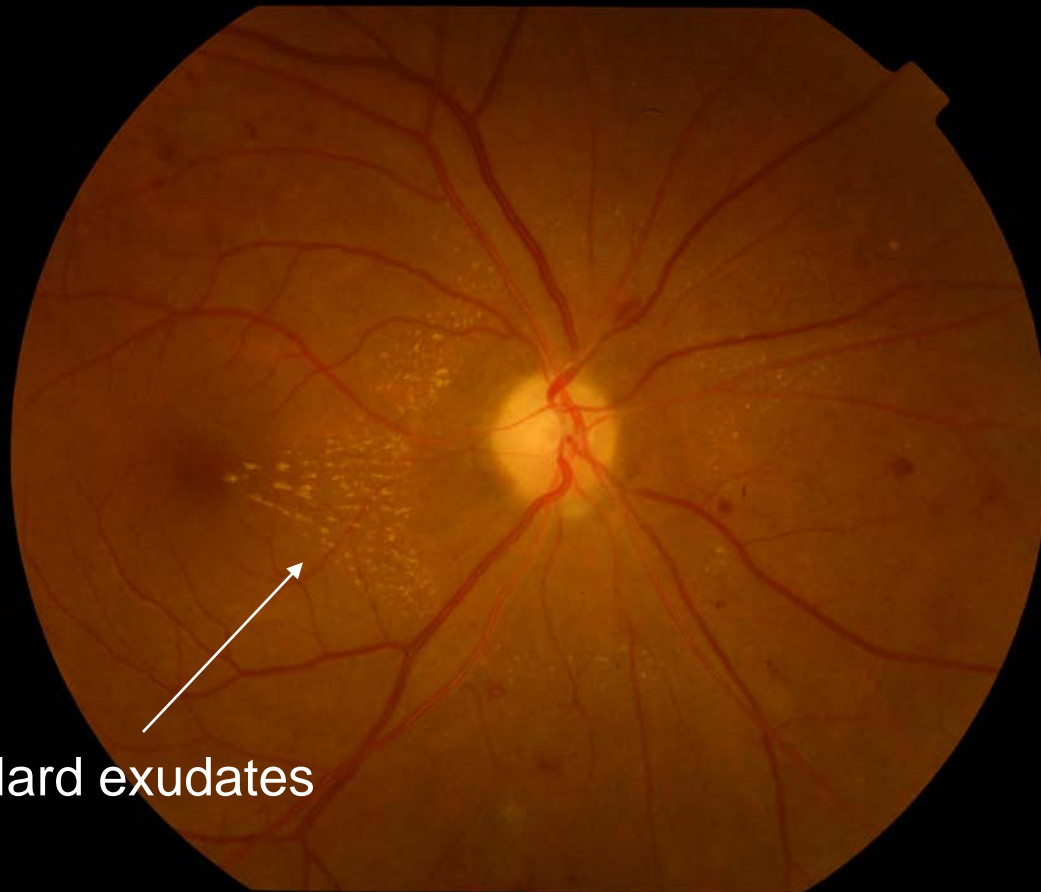
Moderate NPDR



Cotton wool spot

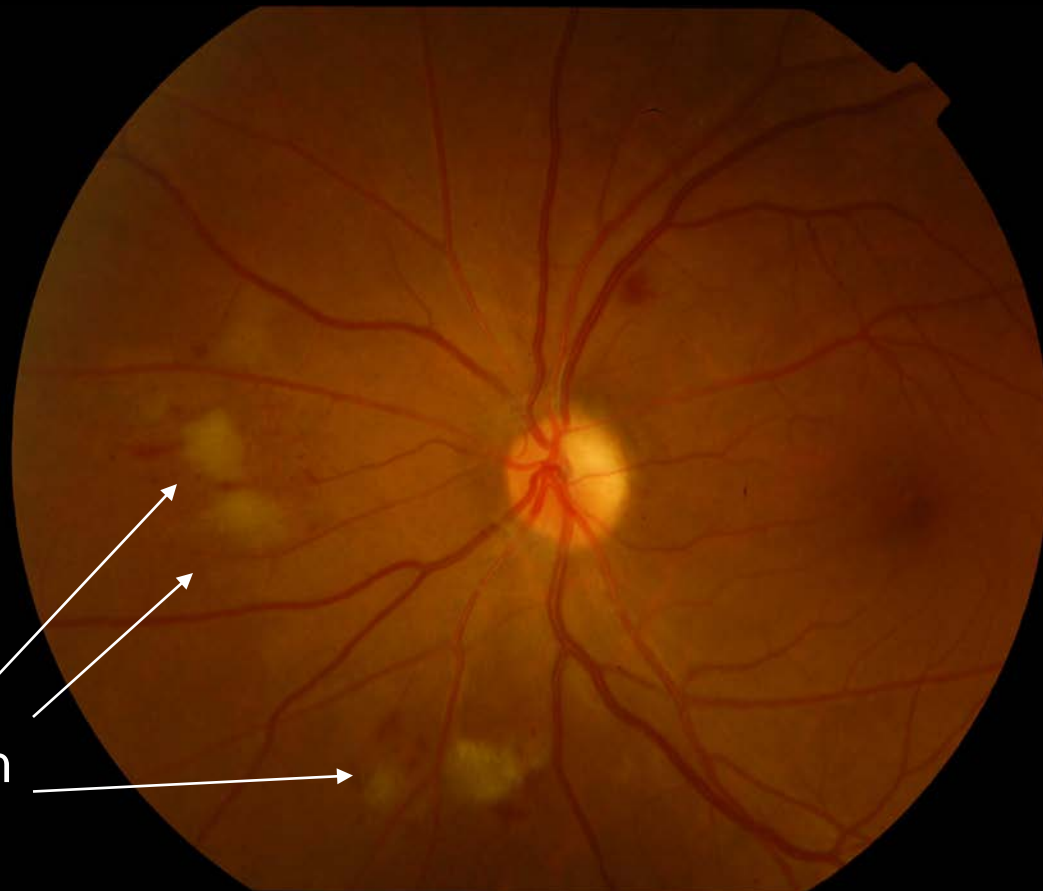
Moderate NPDR

More diffuse dot-blot
retinal haemorrhages
and hard exudates



Hard exudates

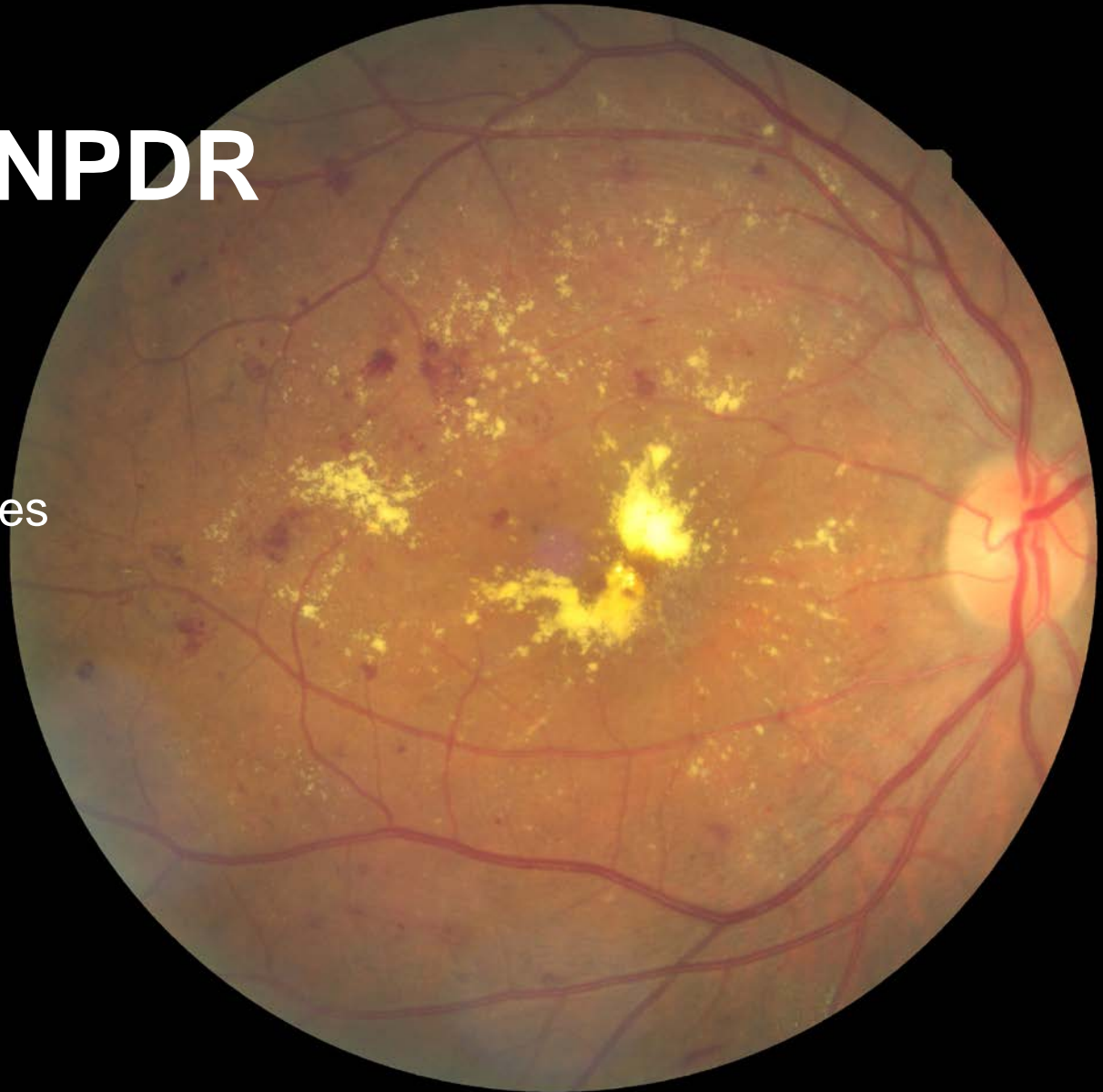
Moderate NPDR



Multiple cotton
wool spots

Severe NPDR

Extensive dot-blot
retinal haemorrhages
and hard exudates

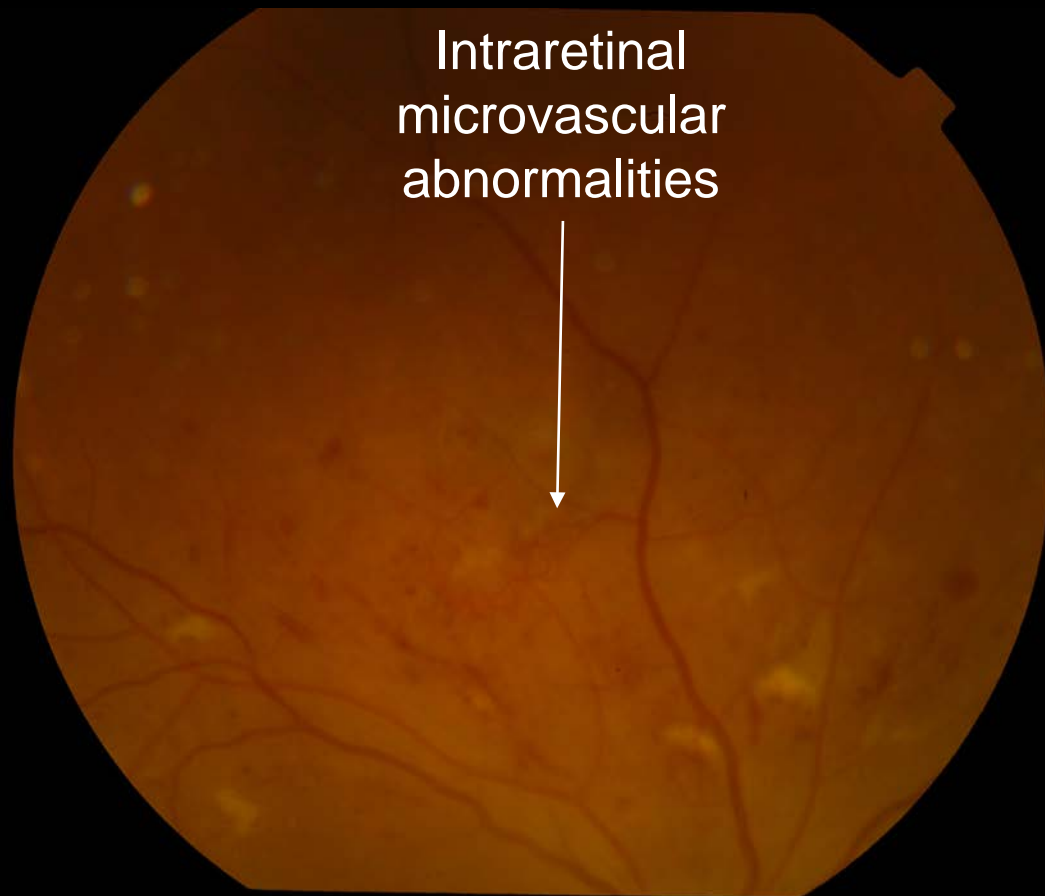


Severe NPDR

Venous dilatation
and tortuosity



Severe NPDR



Vision-threatening diabetic retinopathy

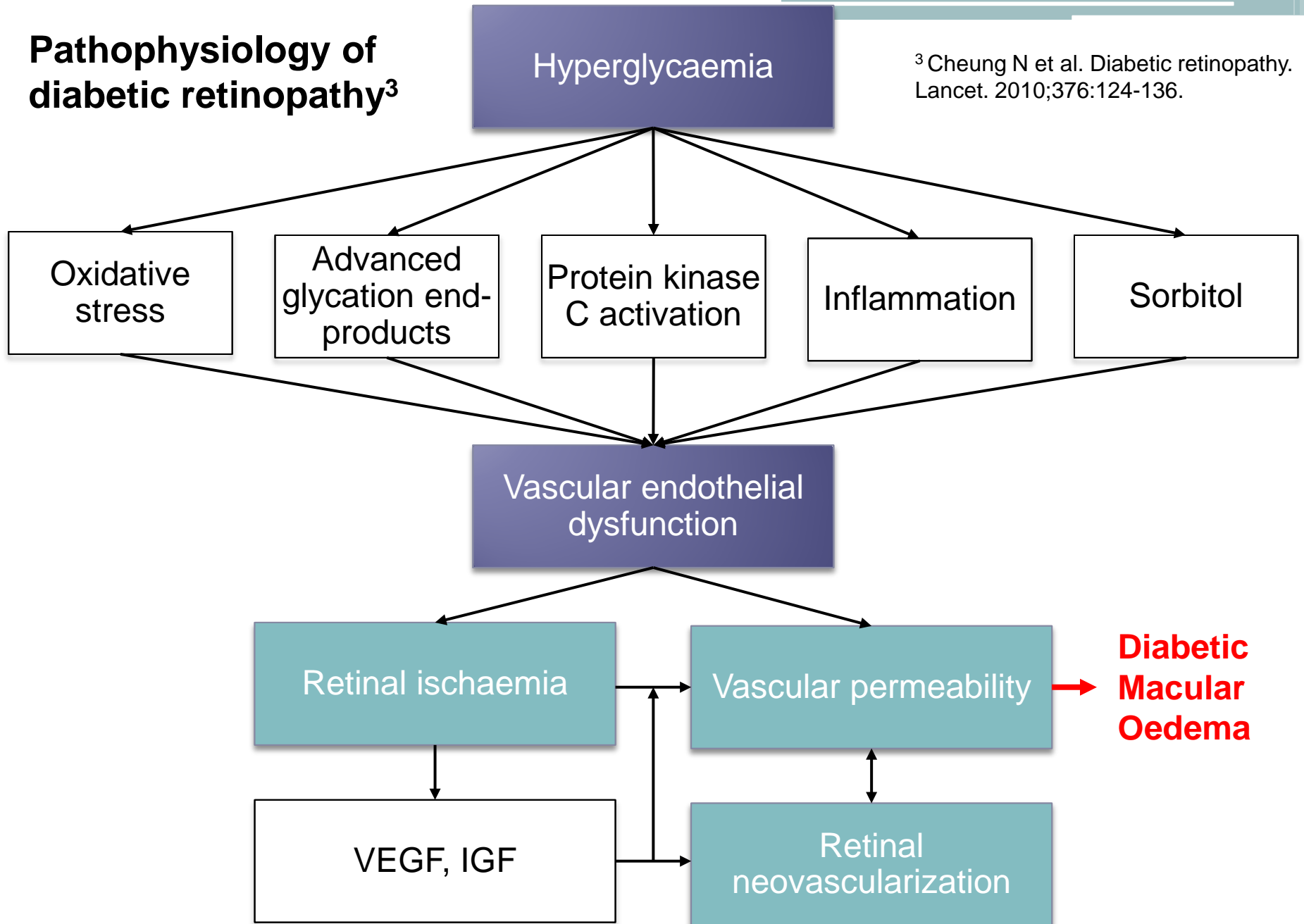
- Diabetic macular oedema
- Proliferative diabetic retinopathy

Vision-threatening condition 1: Diabetic Macular Oedema

A decorative graphic consisting of several horizontal lines of varying lengths and colors (teal, light blue, white) extending from the right side of the slide.

Pathophysiology of diabetic retinopathy³

³Cheung N et al. Diabetic retinopathy. Lancet. 2010;376:124-136.



Diabetic Macular Oedema

Incidence:⁴

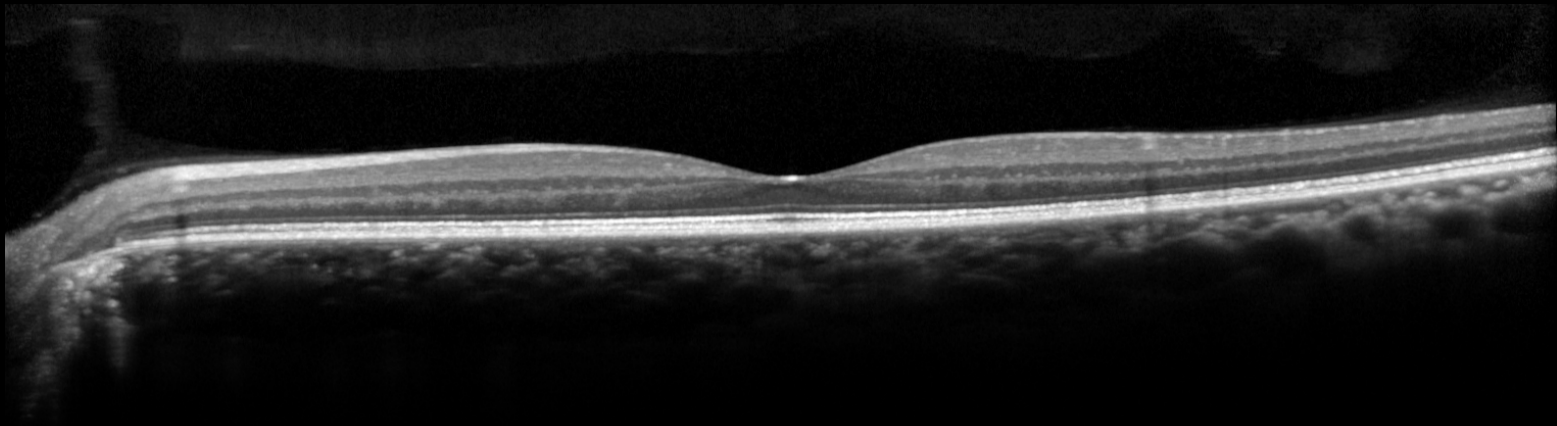
- 14-25% type 2 DM
- 20% of type 1 DM
- developed macular oedema within 10 years

⁴ Klein R et al. The Wisconsin Epidemiologic Study of Diabetic Retinopathy. XV. The long-term incidence of macular edema. *Ophthalmology*. 1995;102(1):7-16.

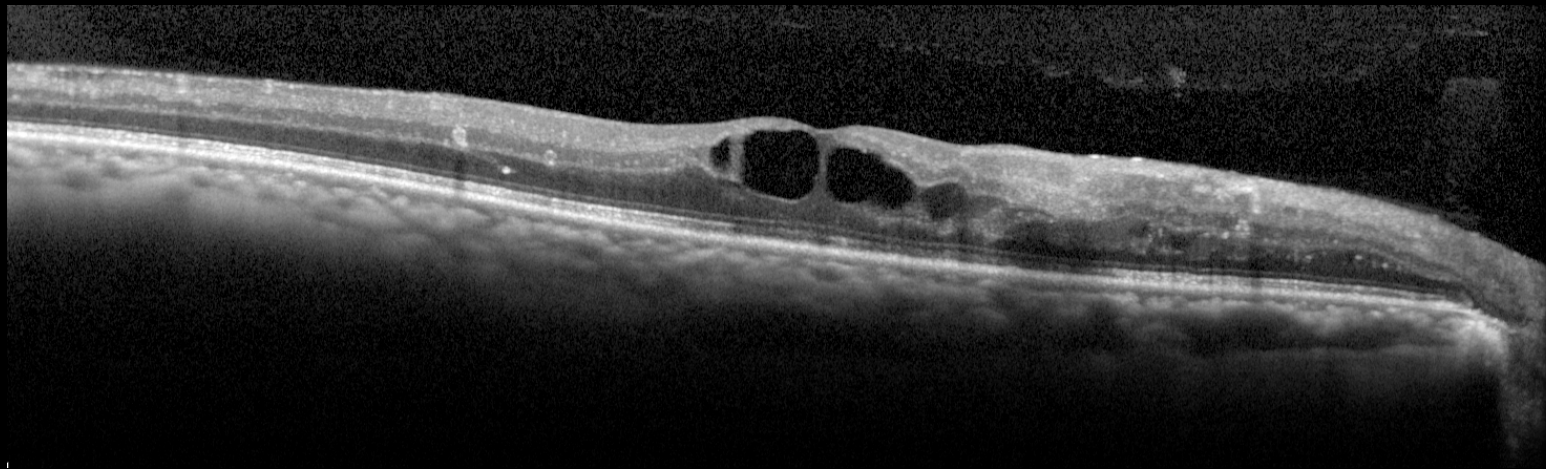
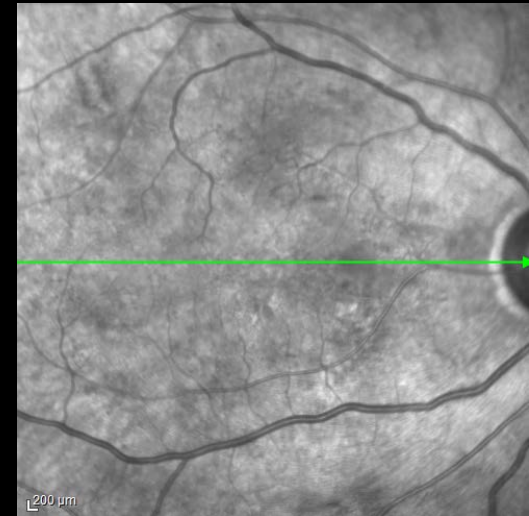
Optical Coherence Tomography (OCT) image

Normal macula

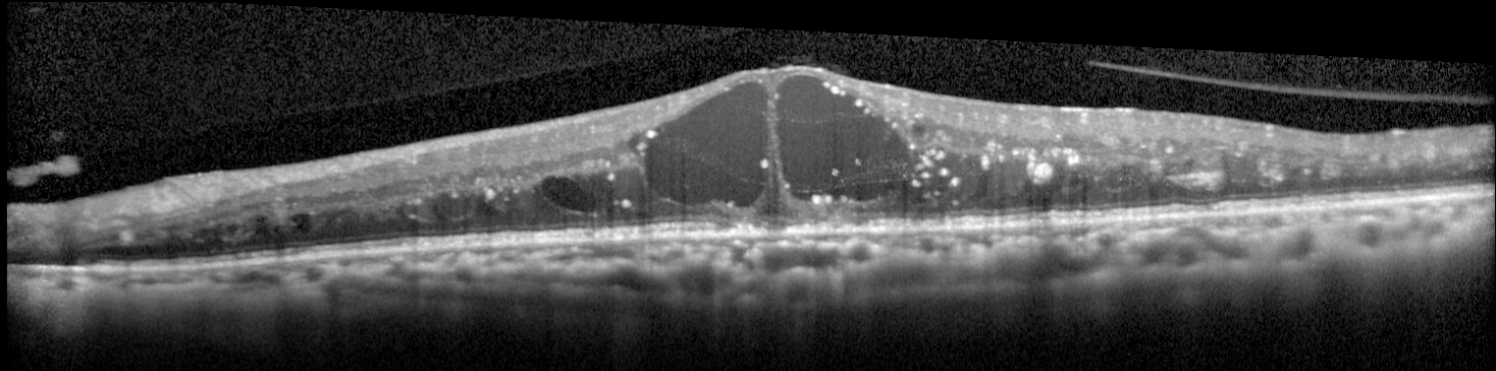
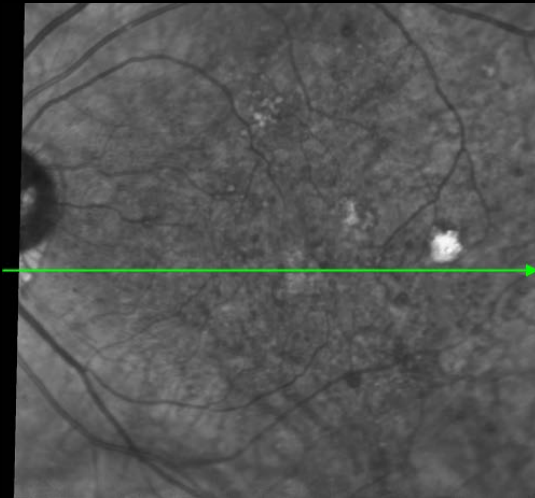
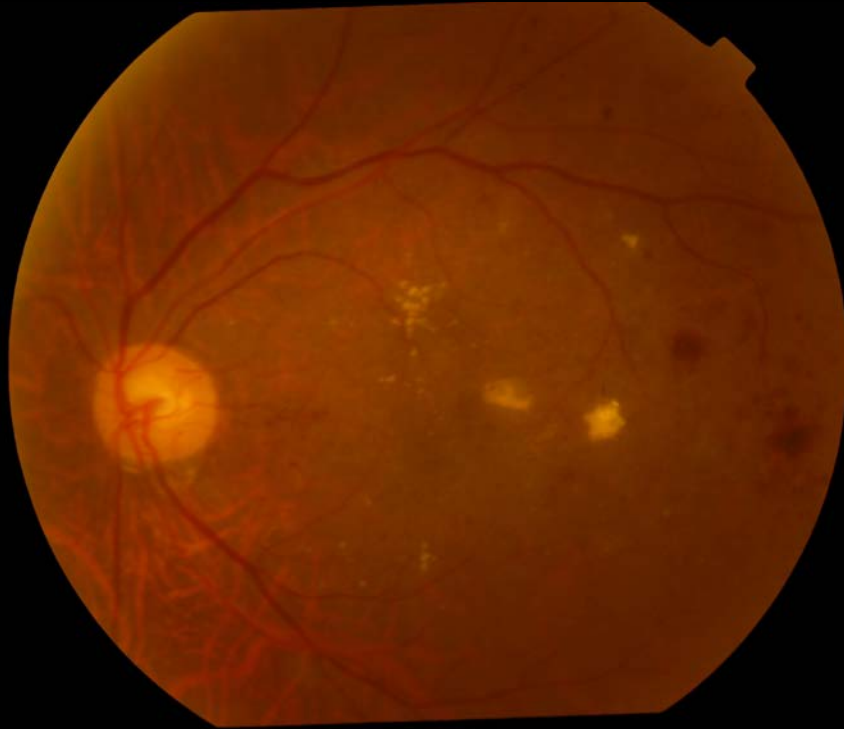
Visual acuity: 20/20

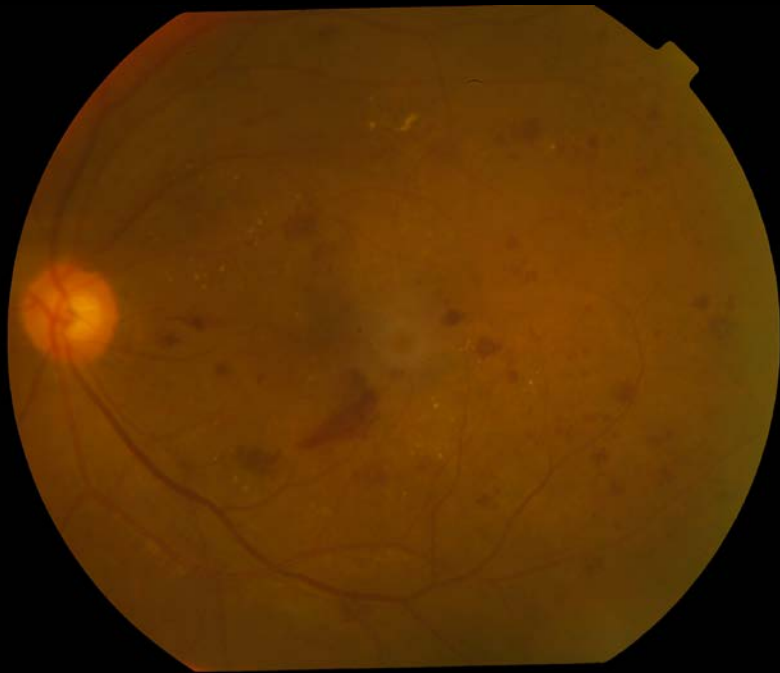


Diabetic Macular Oedema



Diabetic Macular Oedema





- Year 2015
- Visual acuity: 20/40



Poor glycaemic control
(HbA1c 8.3%)

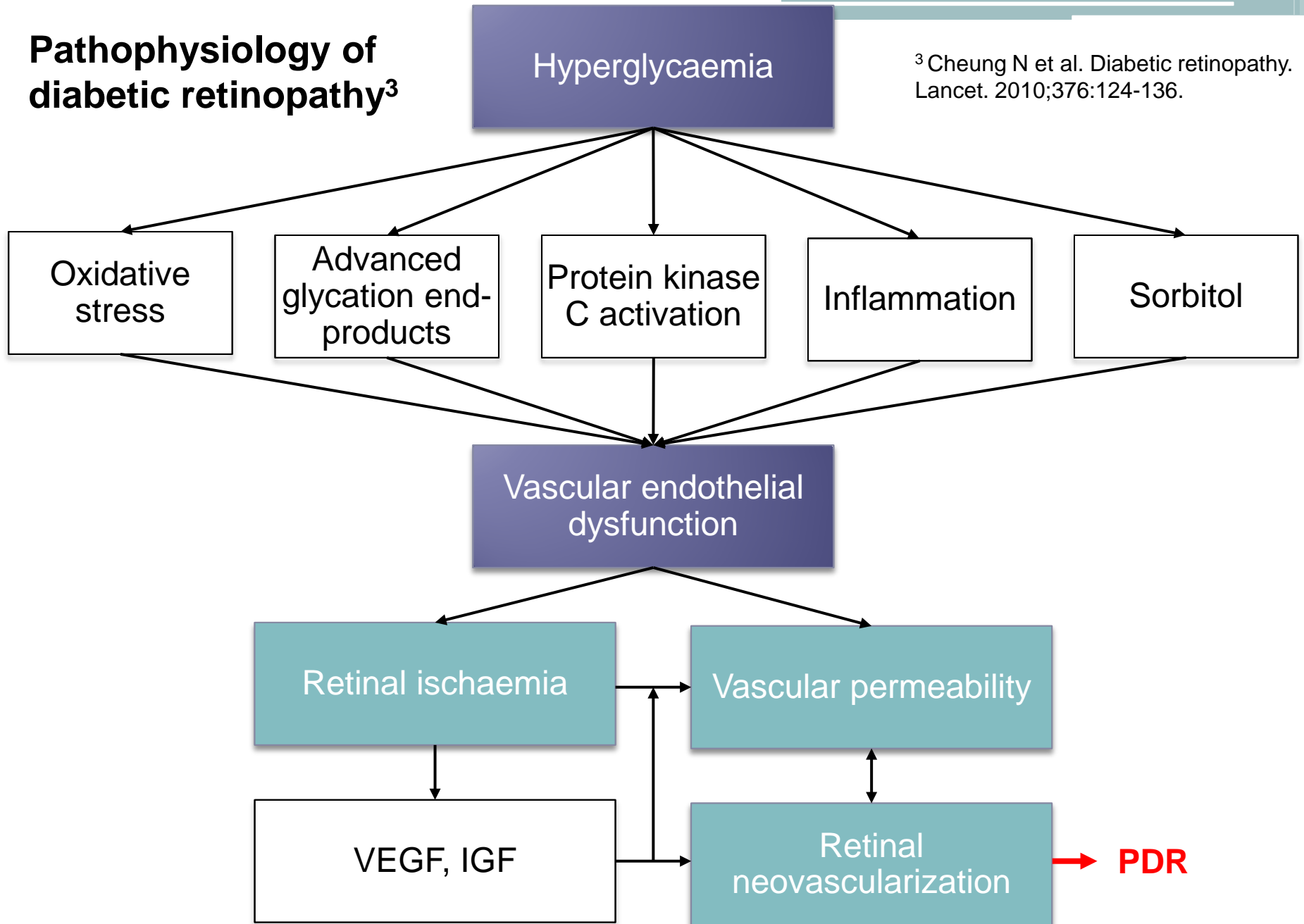
- Year 2017
- Visual acuity: Count-finger
- HbA1c 10.8%
- Fasting glucose 27.1 mmol/L

Vision-threatening condition 2: Proliferative diabetic retinopathy

A decorative graphic consisting of several horizontal lines of varying lengths and colors (teal, white, and light blue) extending from the right side of the slide.

Pathophysiology of diabetic retinopathy³

³Cheung N et al. Diabetic retinopathy. Lancet. 2010;376:124-136.



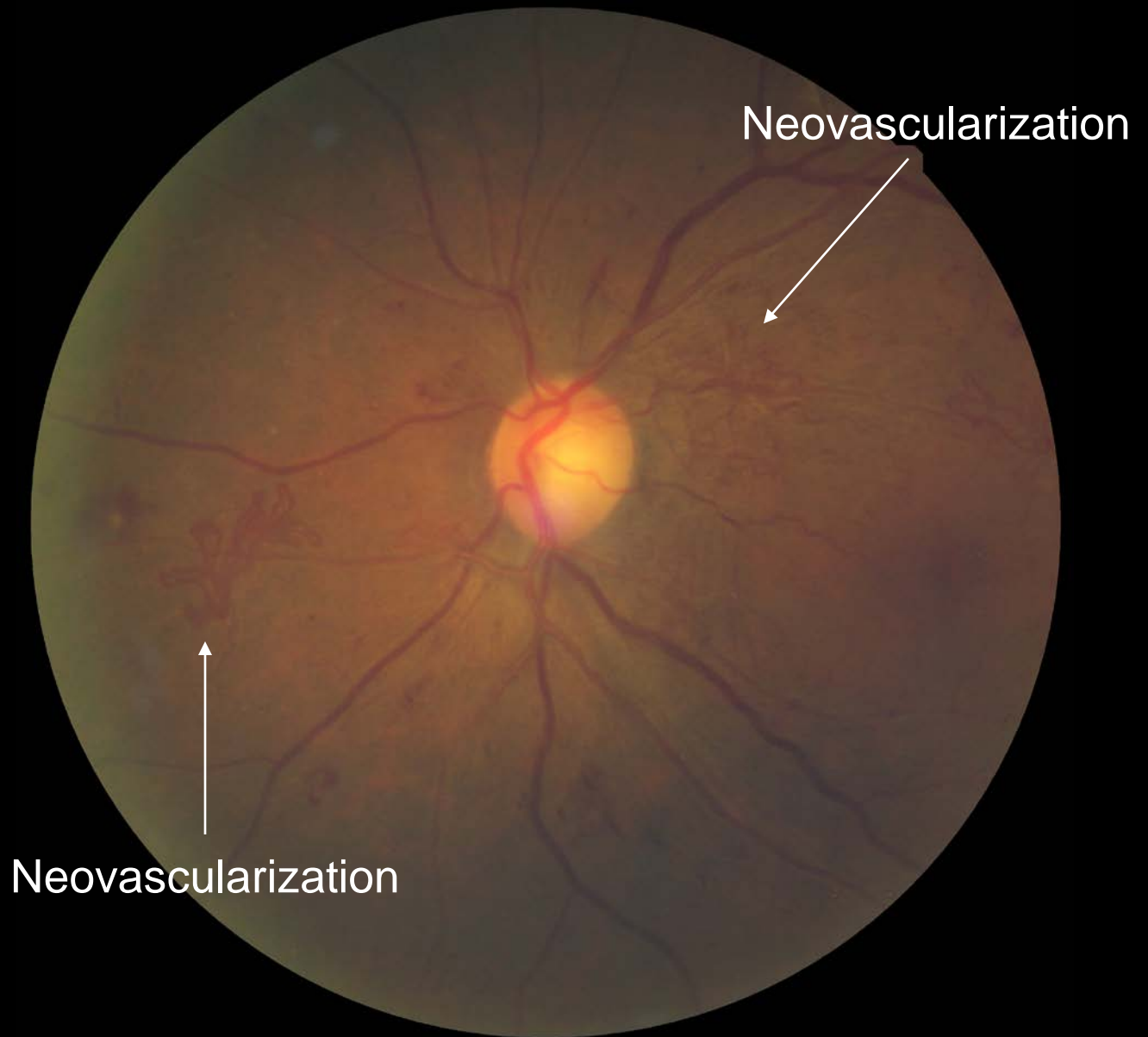
Proliferative diabetic retinopathy

Prevalence:¹

- Proliferative diabetic retinopathy has a prevalence of 7% in individuals with DM

¹ World Health Organization.
Global report on diabetes. 2016.

PDR

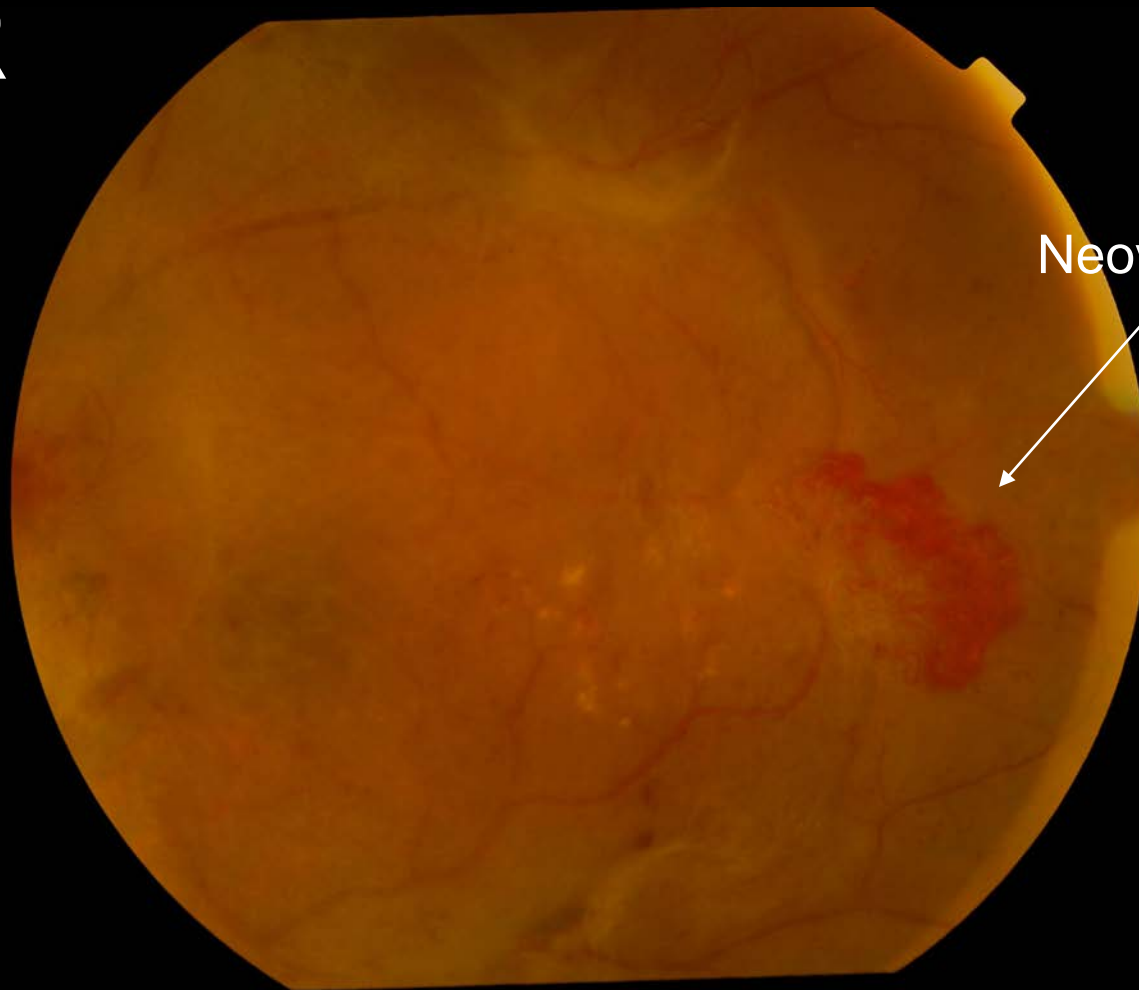


PDR



Neovascularization →

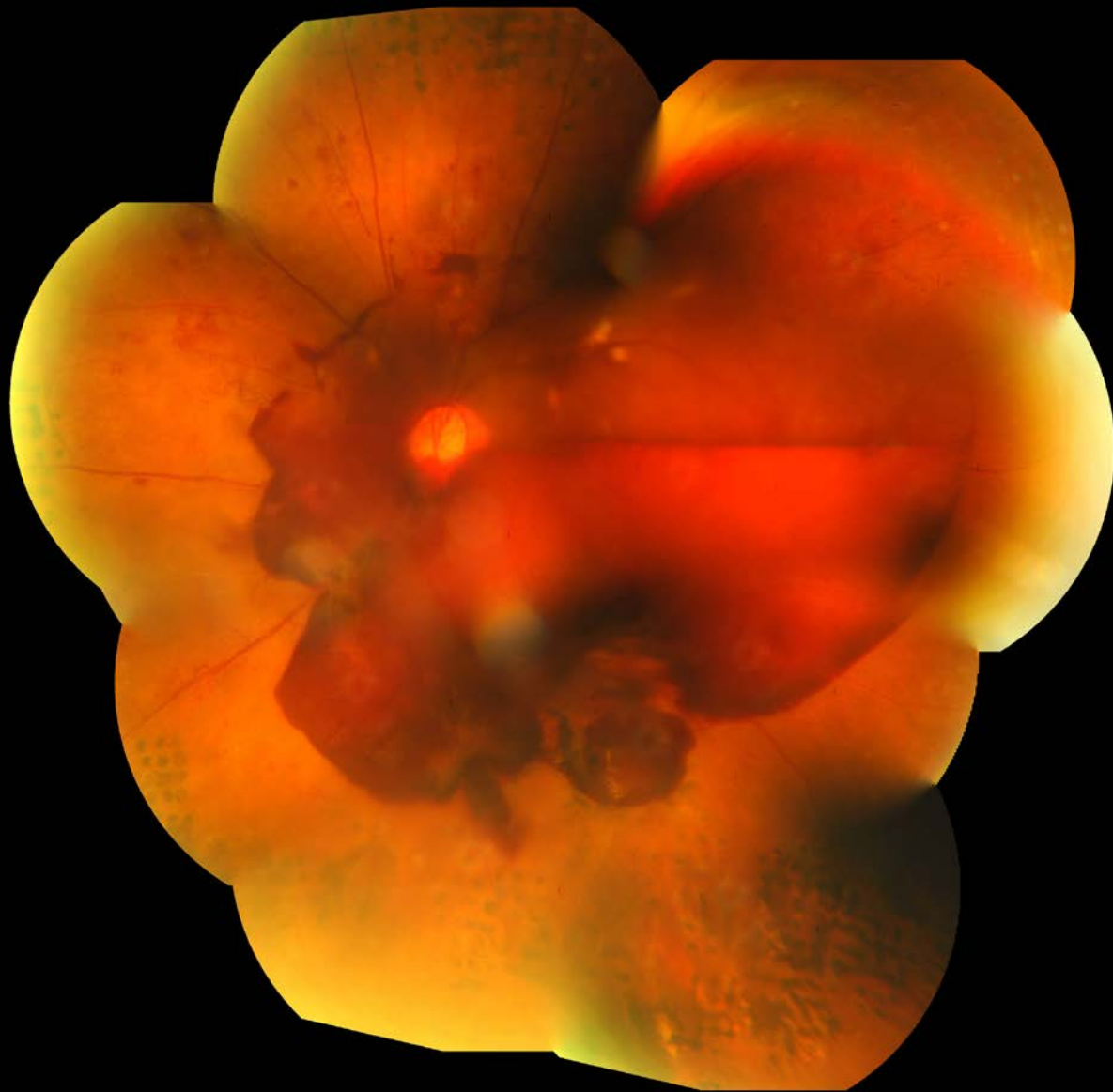
PDR



Neovascularization

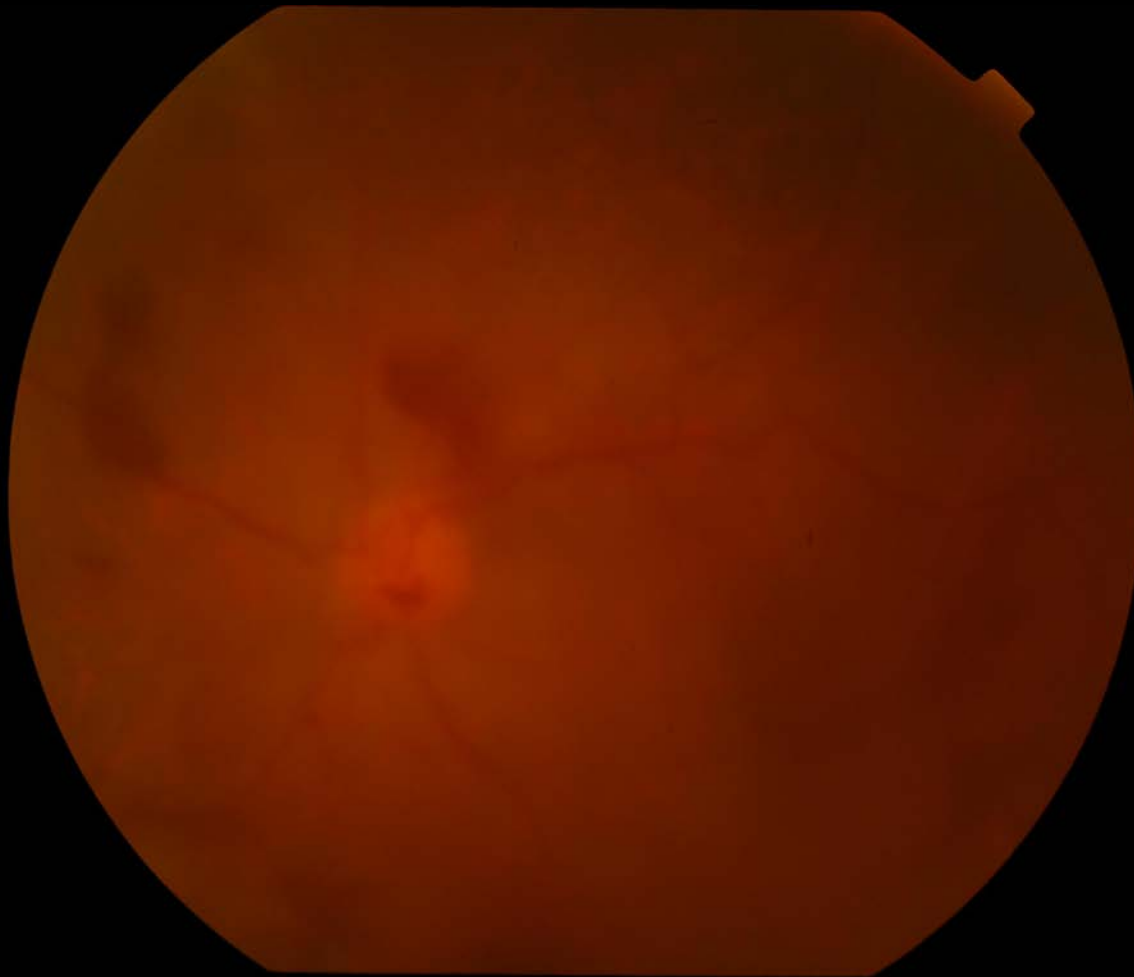


Pre-retinal haemorrhage



Visual acuity:
Count-finger

Vitreous haemorrhage

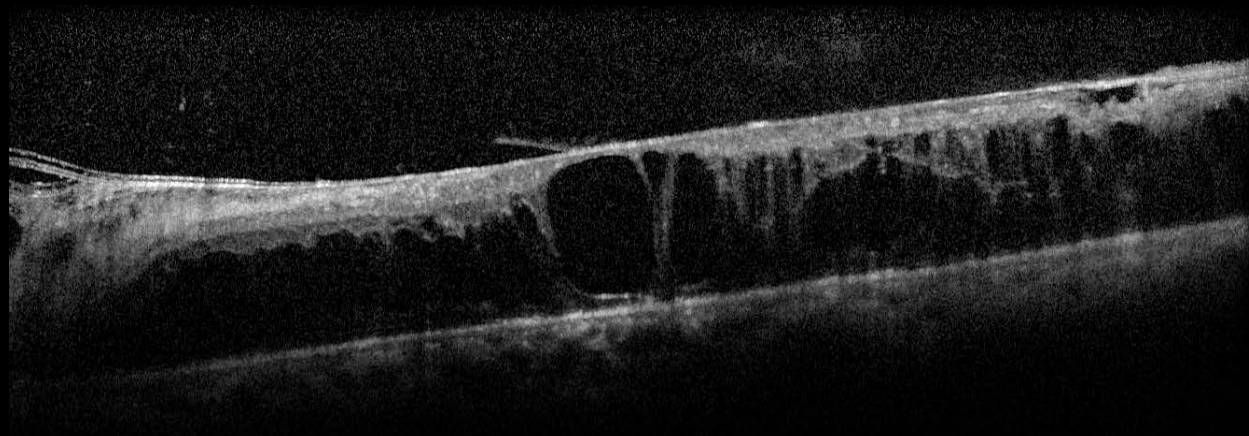
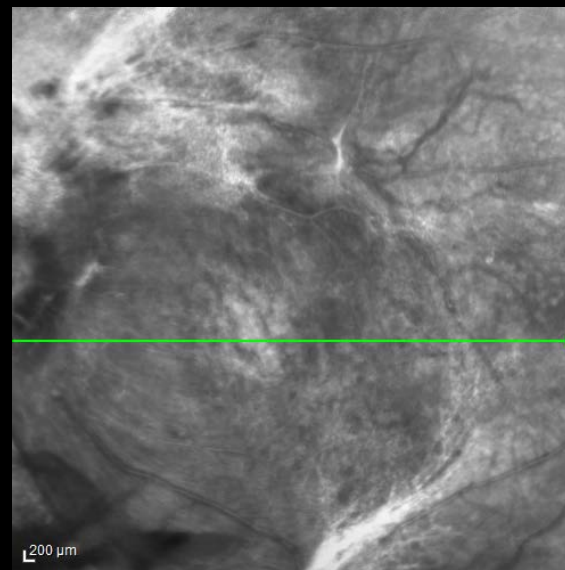
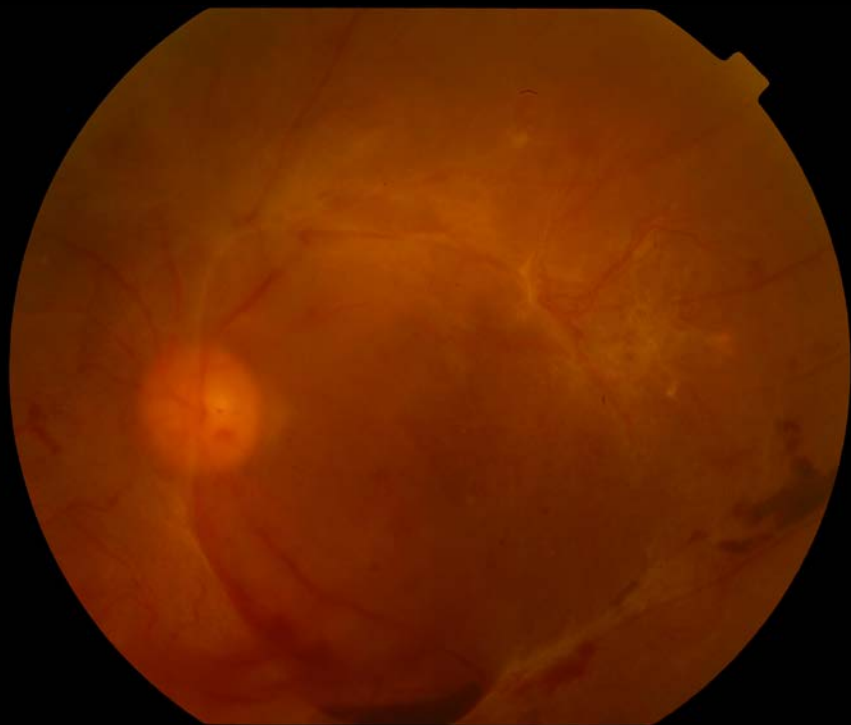


Visual acuity:
20/400

Fibrovascular proliferation



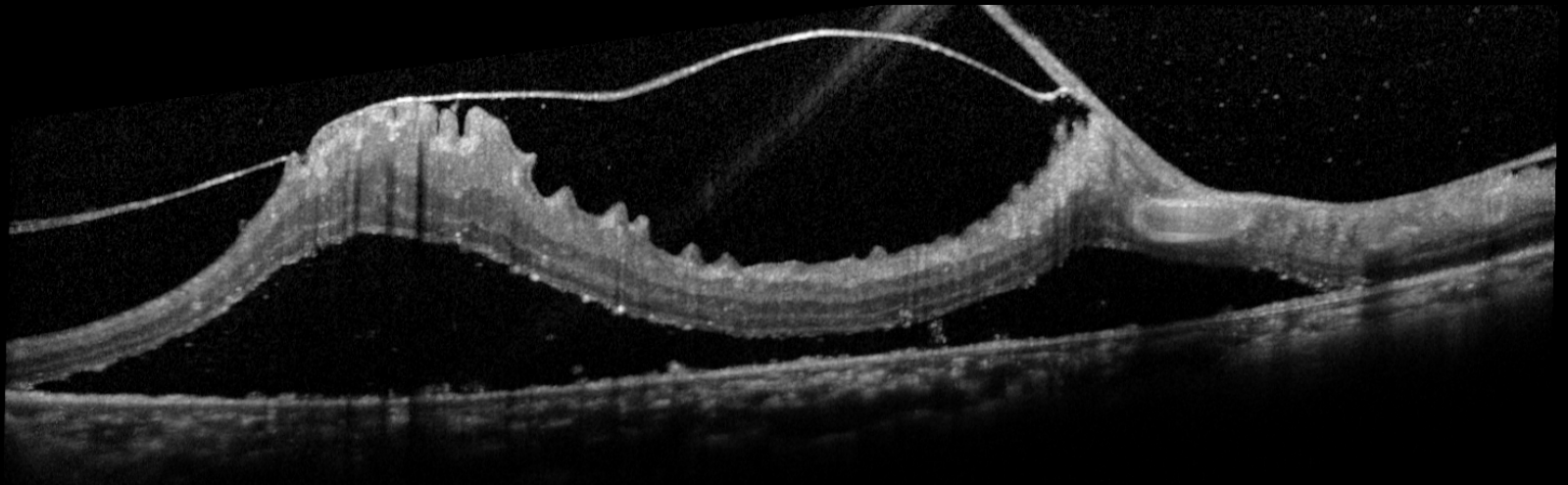
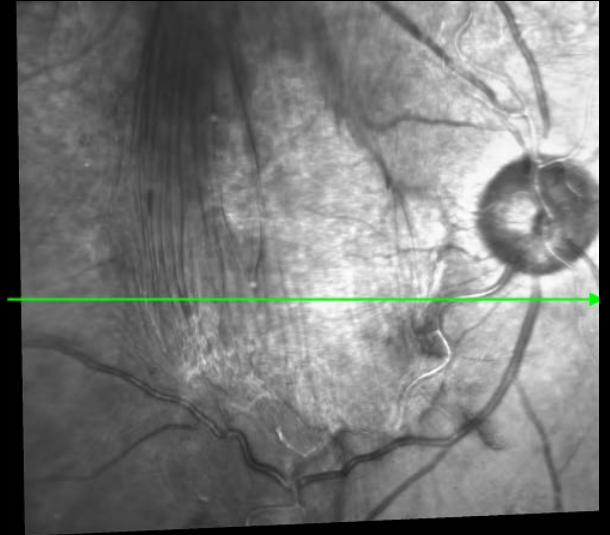
Visual acuity:
Count-finger



Visual acuity:
Count-finger

Tractional retinal detachment

Visual acuity: Count-finger



Other than diabetic retinopathy...

A decorative graphic consisting of a solid teal horizontal bar that spans the width of the slide. Below this bar, on the right side, there are several horizontal lines of varying lengths and colors, including teal and white, creating a layered, stepped effect.

⁵ Pollreis A et al. Diabetic cataract – pathogenesis, epidemiology and treatment. J Ophthalmol. 2010;2010:608751.

Diabetic cataract

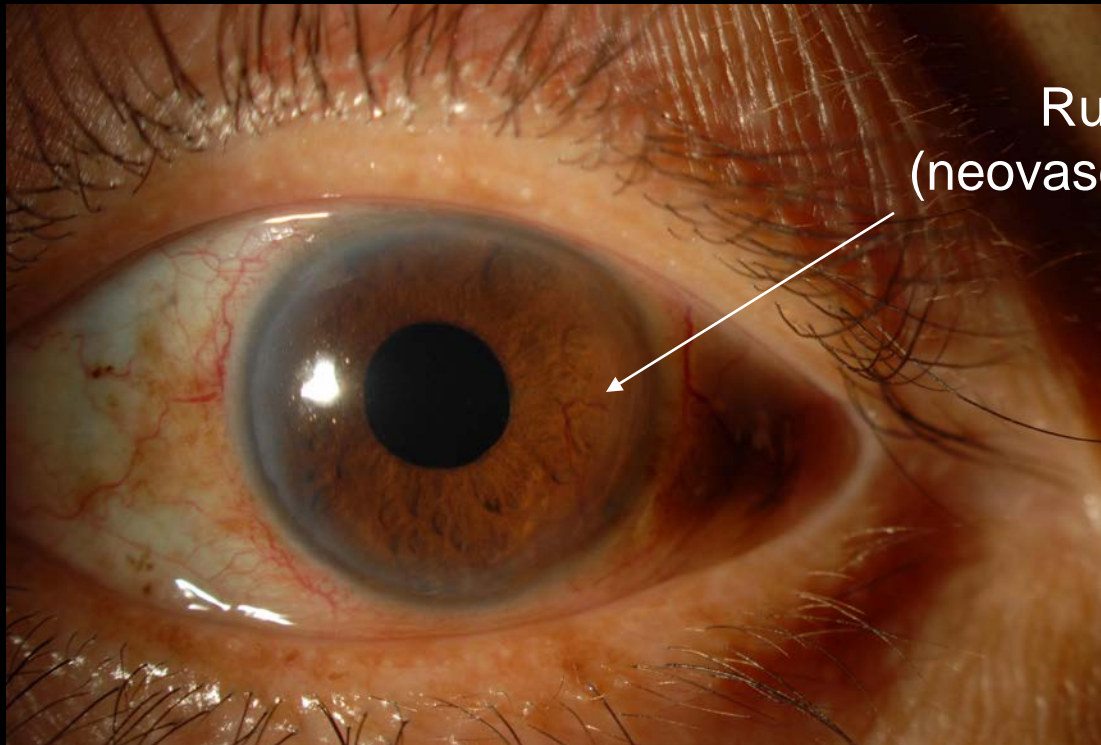
Prevalence:⁵

- 3 to 4-fold increased prevalence of cataract in diabetics under age 65
- 2-fold increased prevalence of cataract in diabetics above age 65

2 forms:

- Diabetic snowflake cataract
- Age-related senile cataract

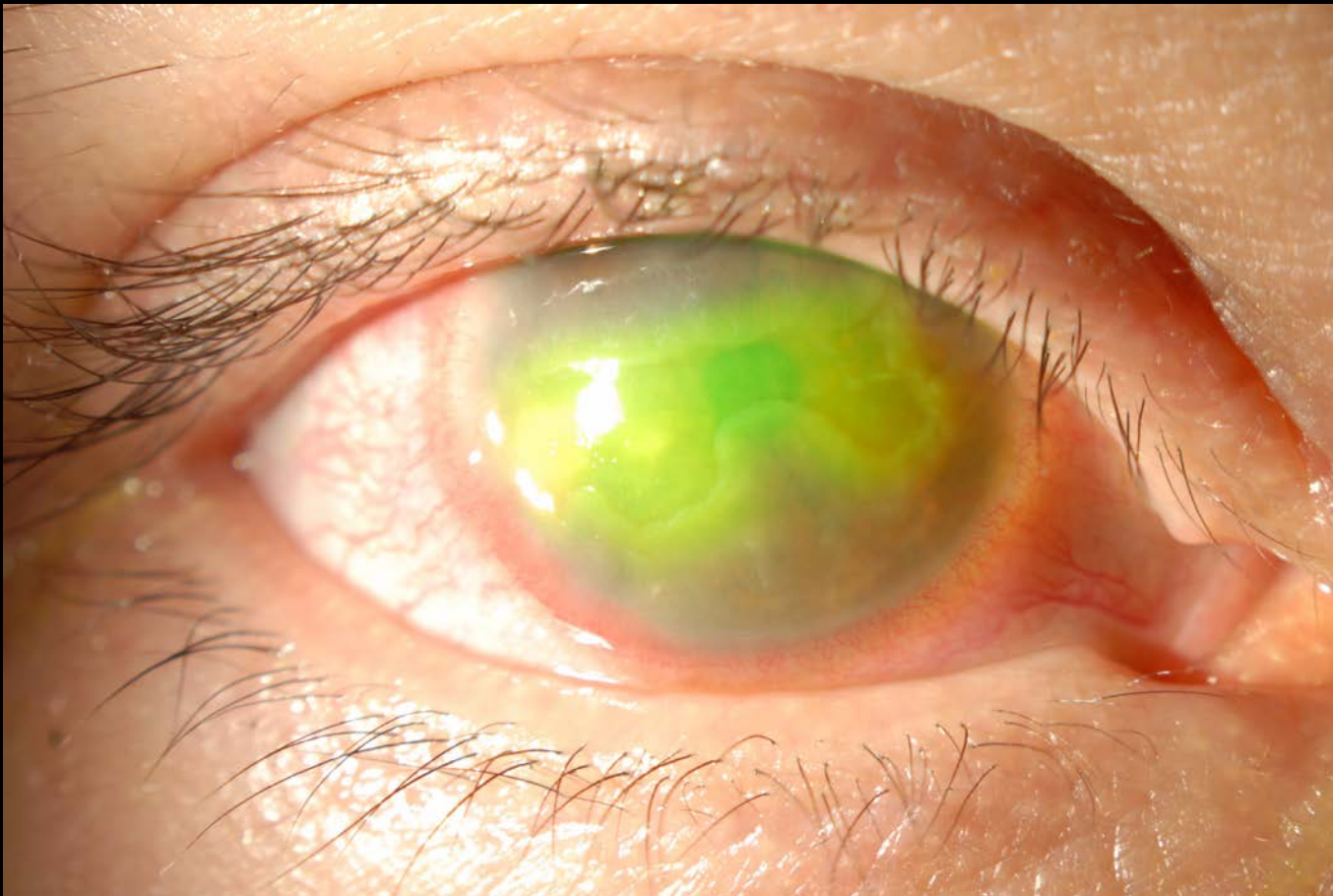
Neovascular Glaucoma



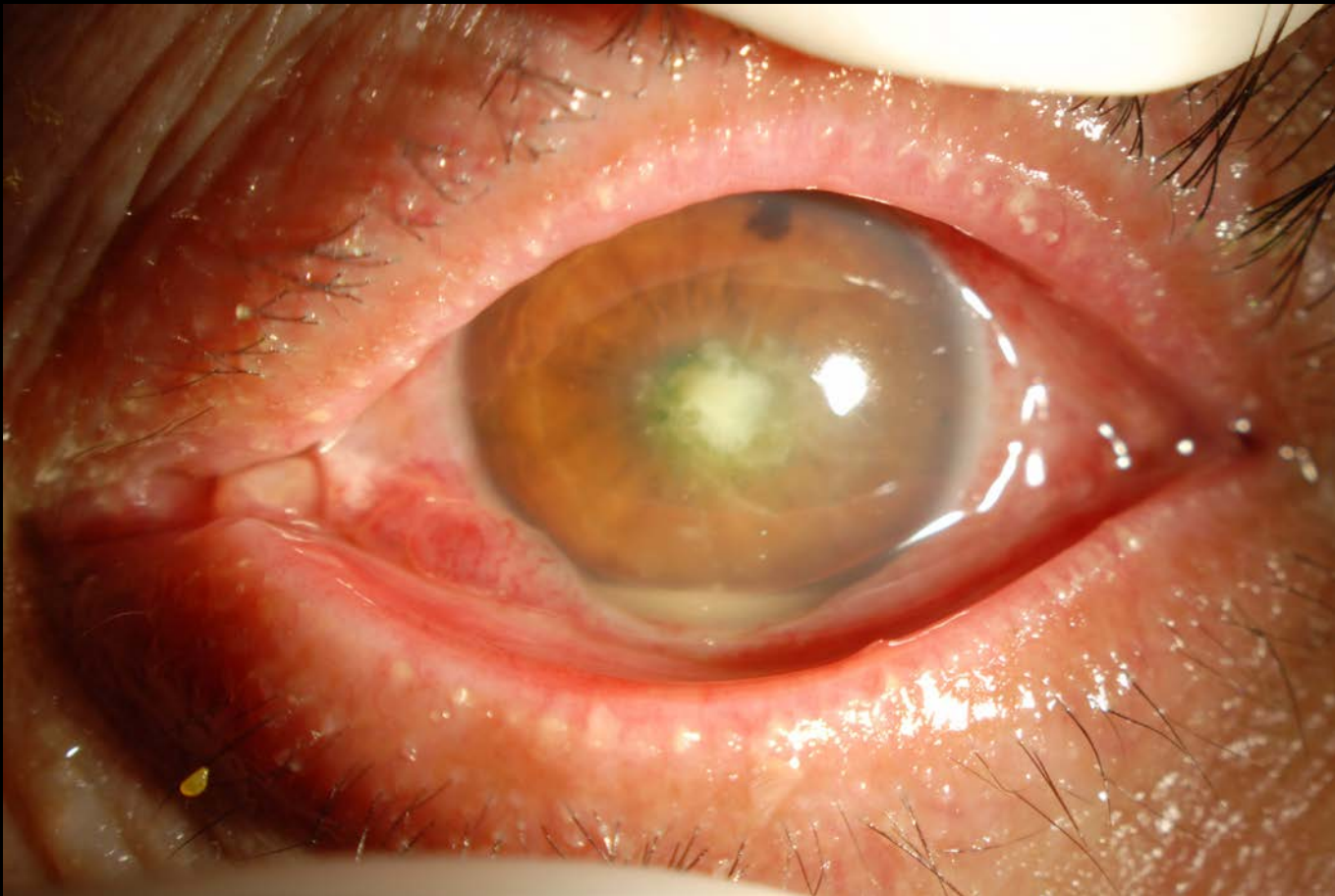
Rubeosis iridis
(neovascularization of iris)

Visual acuity:
No Light Perception

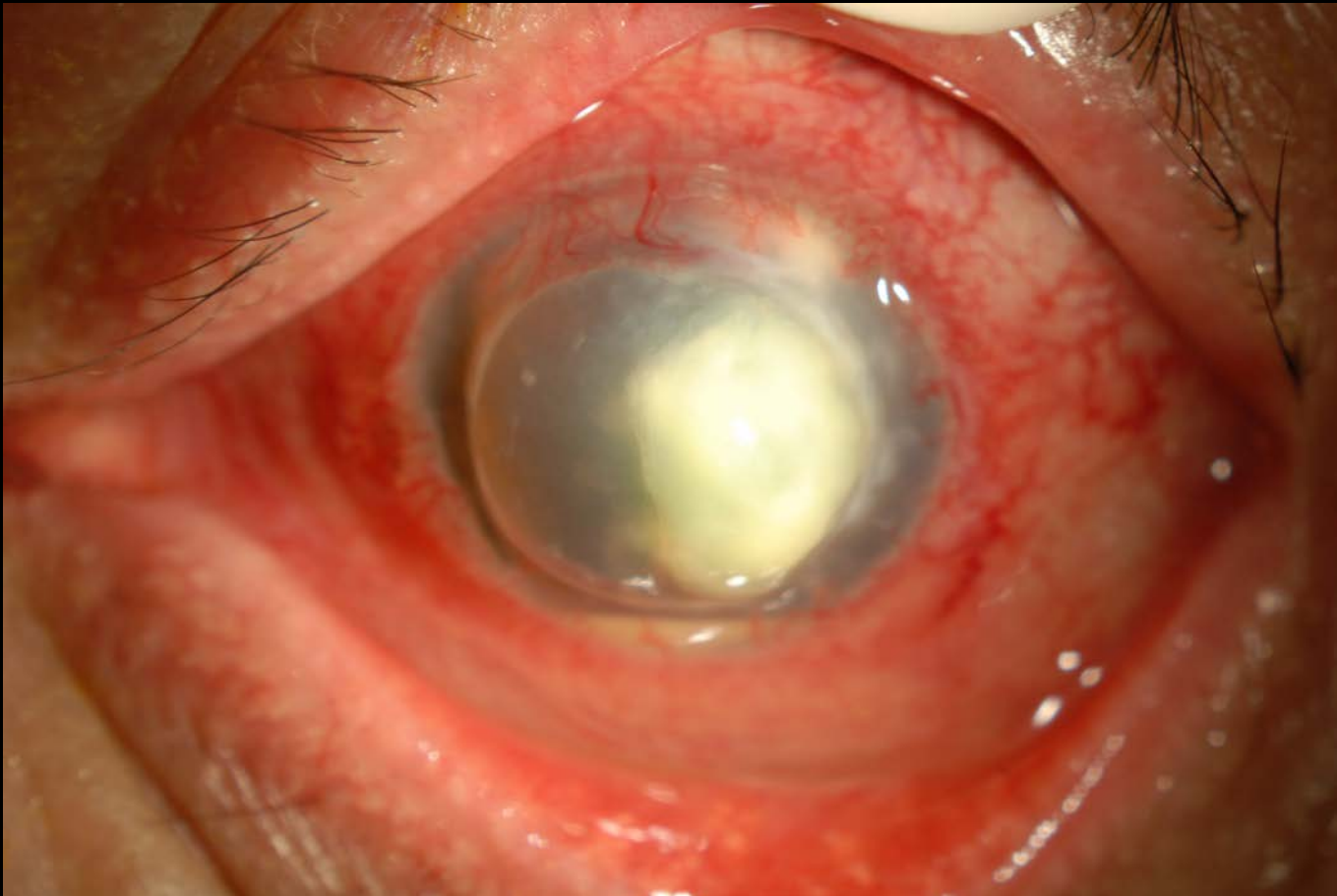
Corneal persistent epithelial defect



Corneal infection (keratitis)



Corneal abscess



Summary

- Diabetes affects different parts of the eyes
- **Diabetic retinopathy** is a common and important cause for visual impairment
- **Diabetic macular oedema** and **proliferative diabetic retinopathy** are two major vision-threatening conditions related to diabetes
- Regular eye screening, good glycaemic control, and prompt and effective interventions are keys to successful management

Thank you

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