

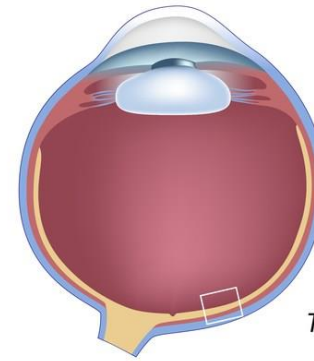
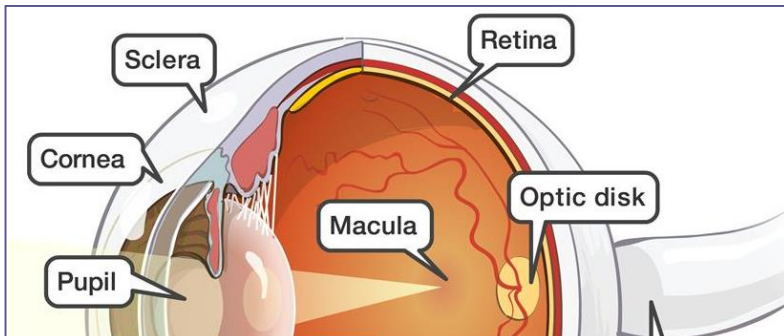
Retinal diseases

Macular Degeneration & Diabetic Retinopathy

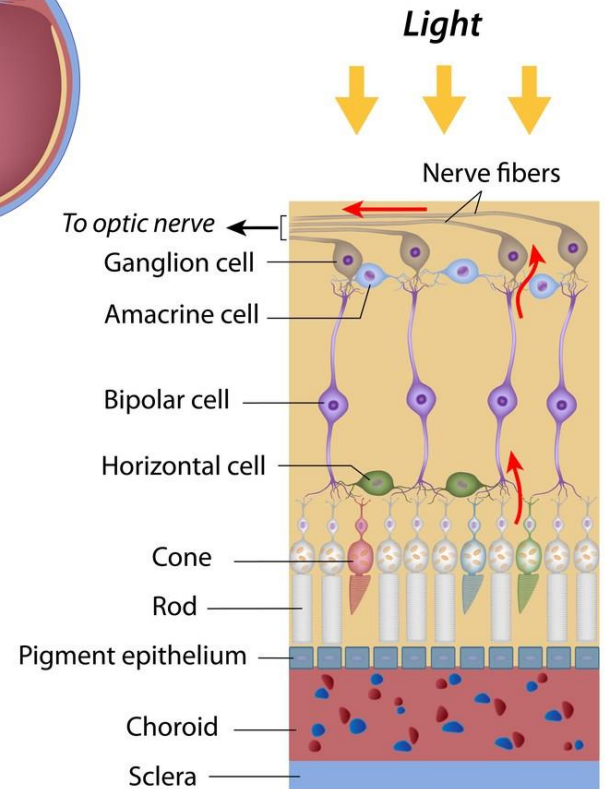
David Garland

NP

Ophthalmology, ADHB

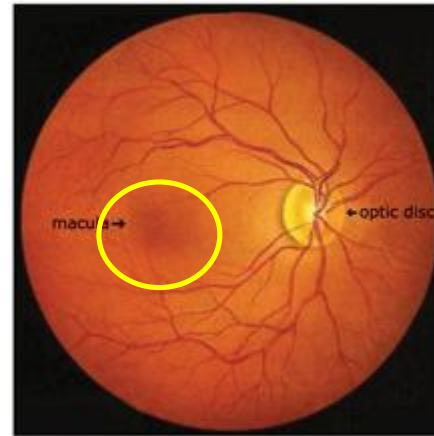
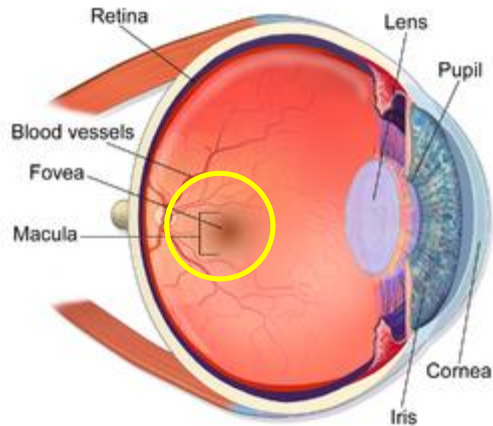


Structure of the Retina

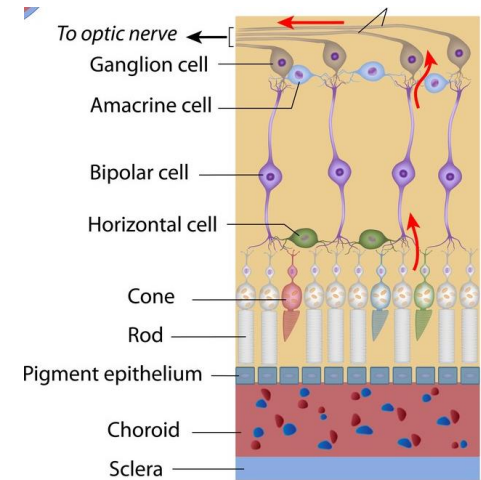
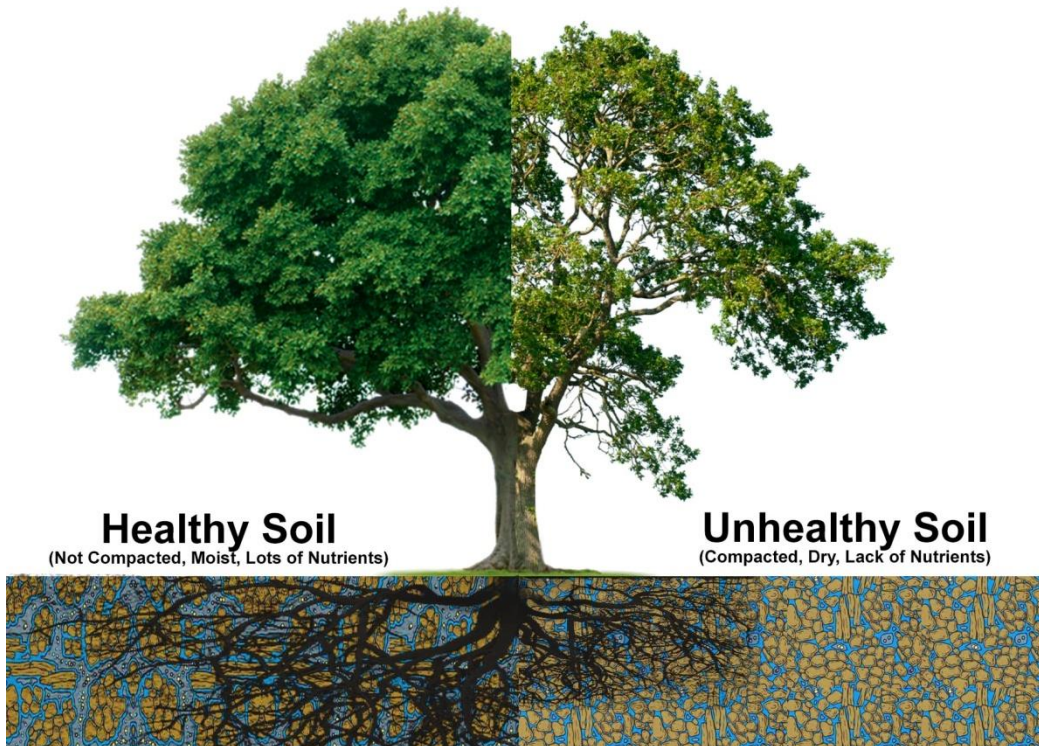


Age-Related Macular Degeneration (AMD)

- Degenerative disorder affecting the macula



- Leading cause of blindness/vision impairment 60+ age group in developed countries

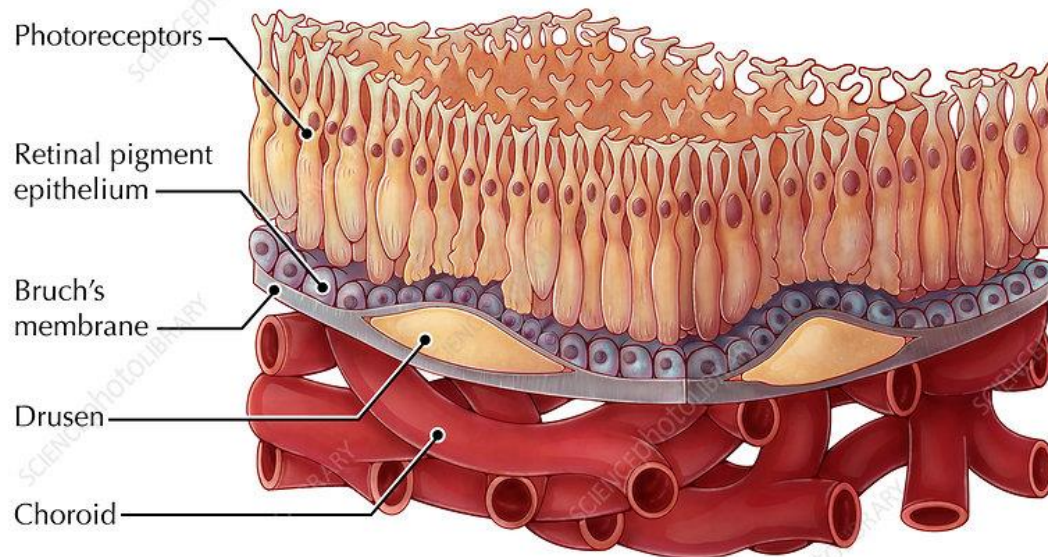
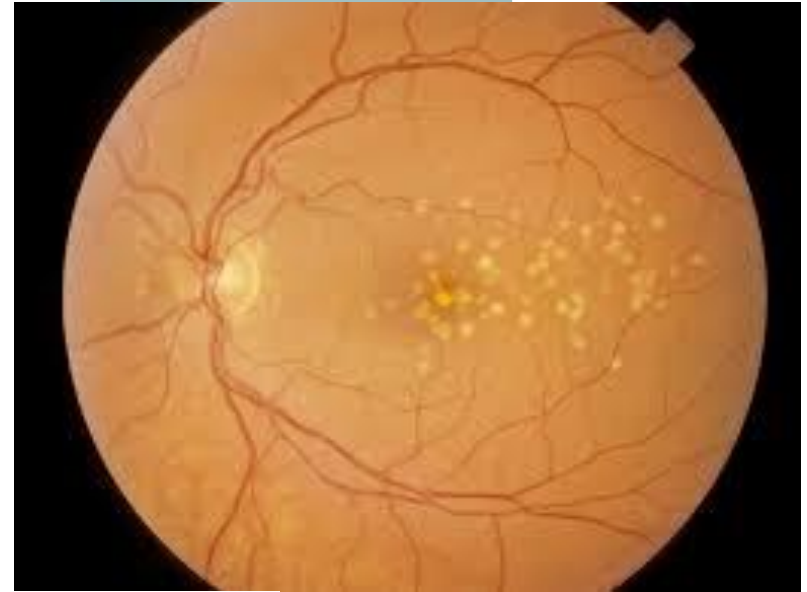


Aeitology



Drusen

- Formation lipid lesion under the retina



Pathophysiology

- Unknown

Drusen



Oxidative stress ?

Inflammatory processes ?

Mitochondrial dysfunction?

Genetics

NZ Context

- The risk of age-related macular degeneration appears to be equal between males and females
- Predominantly affects people of Caucasian or SE Asian ethnicity
- Maori/Polynesian low incidence
- Family hx AMD – ~4x greater risk of developing
- Smoking main modifiable risk

NZ Context

- AMD affects
 - 1 in 7 50+
 - 1 in 4 80+
 - 1 in 3 85+
- Est. socioeconomic cost **\$391m**
- Est. **206,000 2018**, expected to **increase 40%** over next 20 years

Risk factors

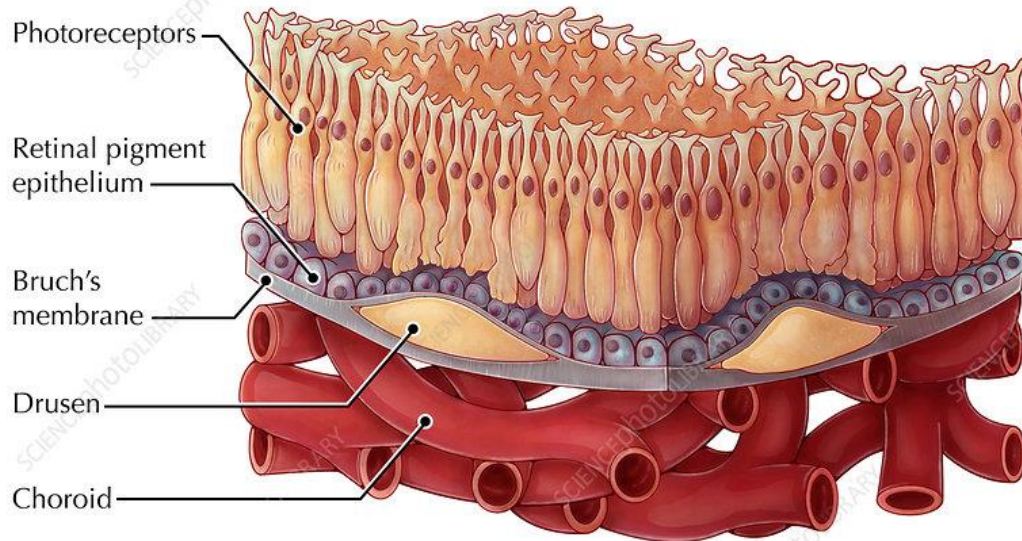
- Age
- Family hx
- Smoking
- UV light
- Diet



AMD Classification

- Early
 - Dry – small/medium drusen ($<125\mu\text{m}$)
- Late
 - Dry – large ‘soft’ drusen; geographic atrophy
 - Wet – exudative; neovascularisation

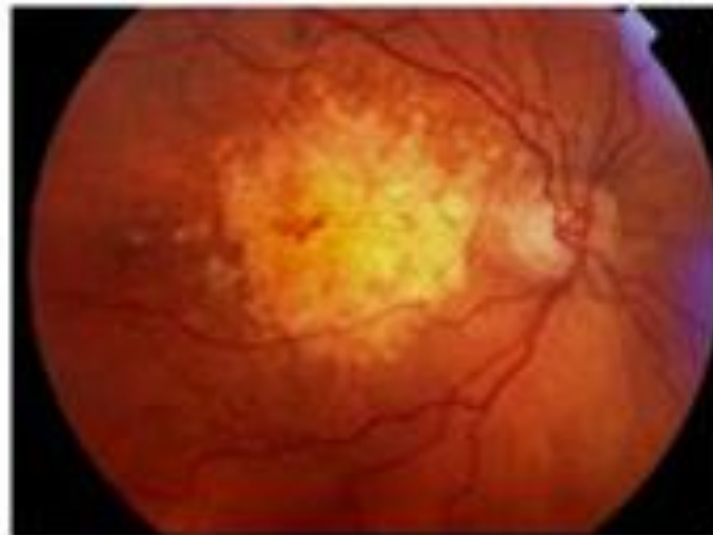
Dry AMD - Early



Dry AMD - Late



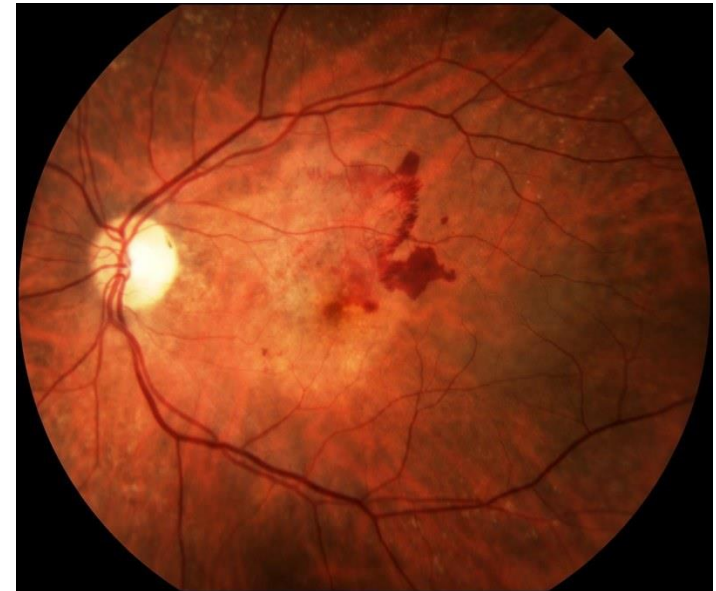
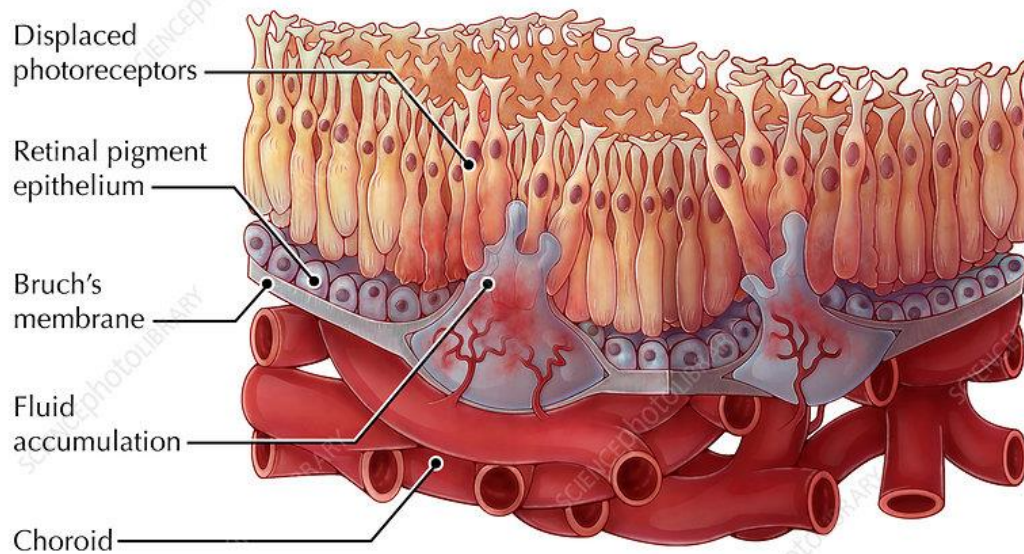
Geographic Atrophy (GA)



Geographic atrophy



Wet AMD



Symptoms

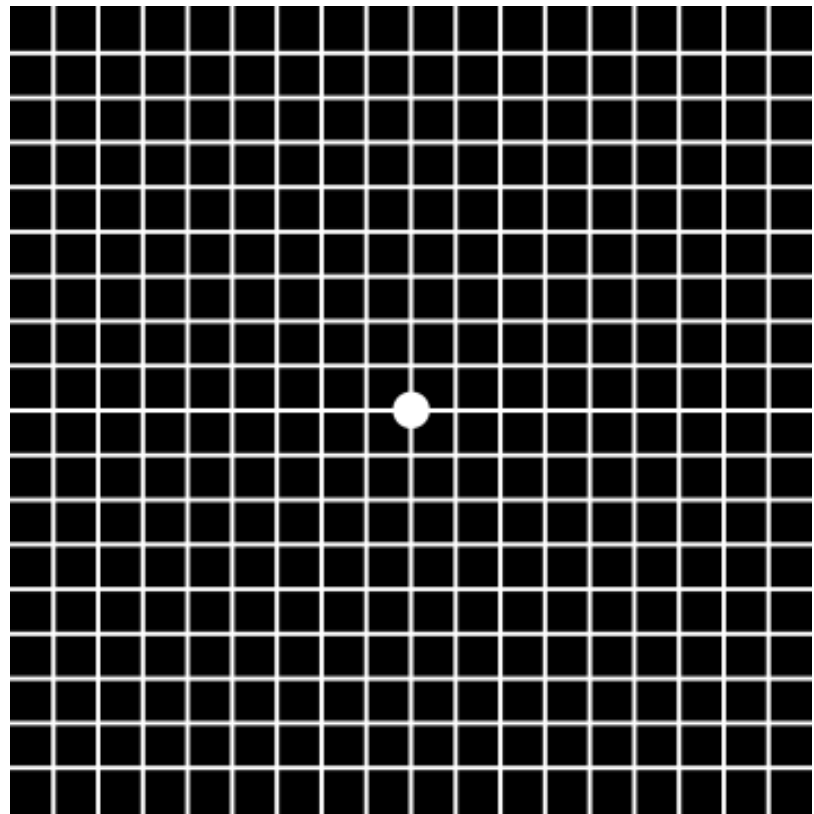
- Dry – insidious loss of central vision
- Wet – sudden loss of central vision



Treatment (early)

- Regular testing of central vision

AMSLER GRID



Treatment (early)

- Diet
 - spinach, lettuce and kale
 - green and orange peppers, corn
 - pumpkin, broccoli, green beans, zucchini
 - Kiwifruit, red grapes, apples, oranges, melon
 - Egg yolk



Treatment (early)

- Supplements (AREDS)
 - 500 mg vitamin C
 - 400 IU vitamin E
 - 25 mg zinc
 - 2 mg copper
 - 10 mg lutein
 - 2 mg zeaxanthin

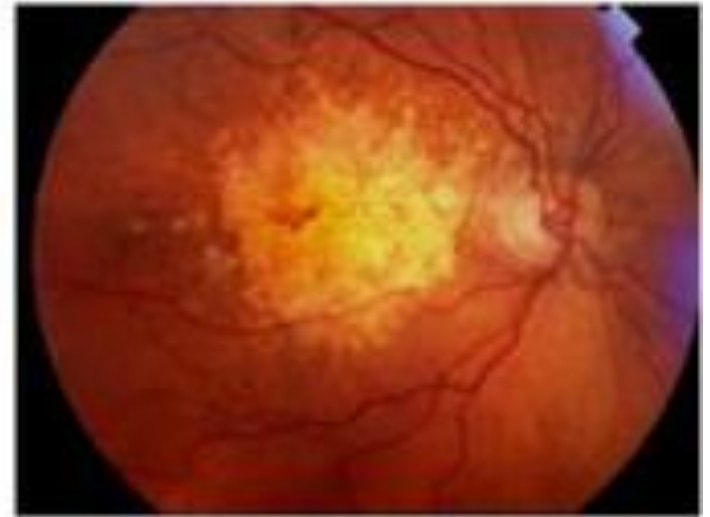


Treatment (Late - Dry AMD)

- *Nil*

- Refer to Low vision service

- Refer to Blind Foundation (RNZFB)



Treatment (Late - Wet AMD)

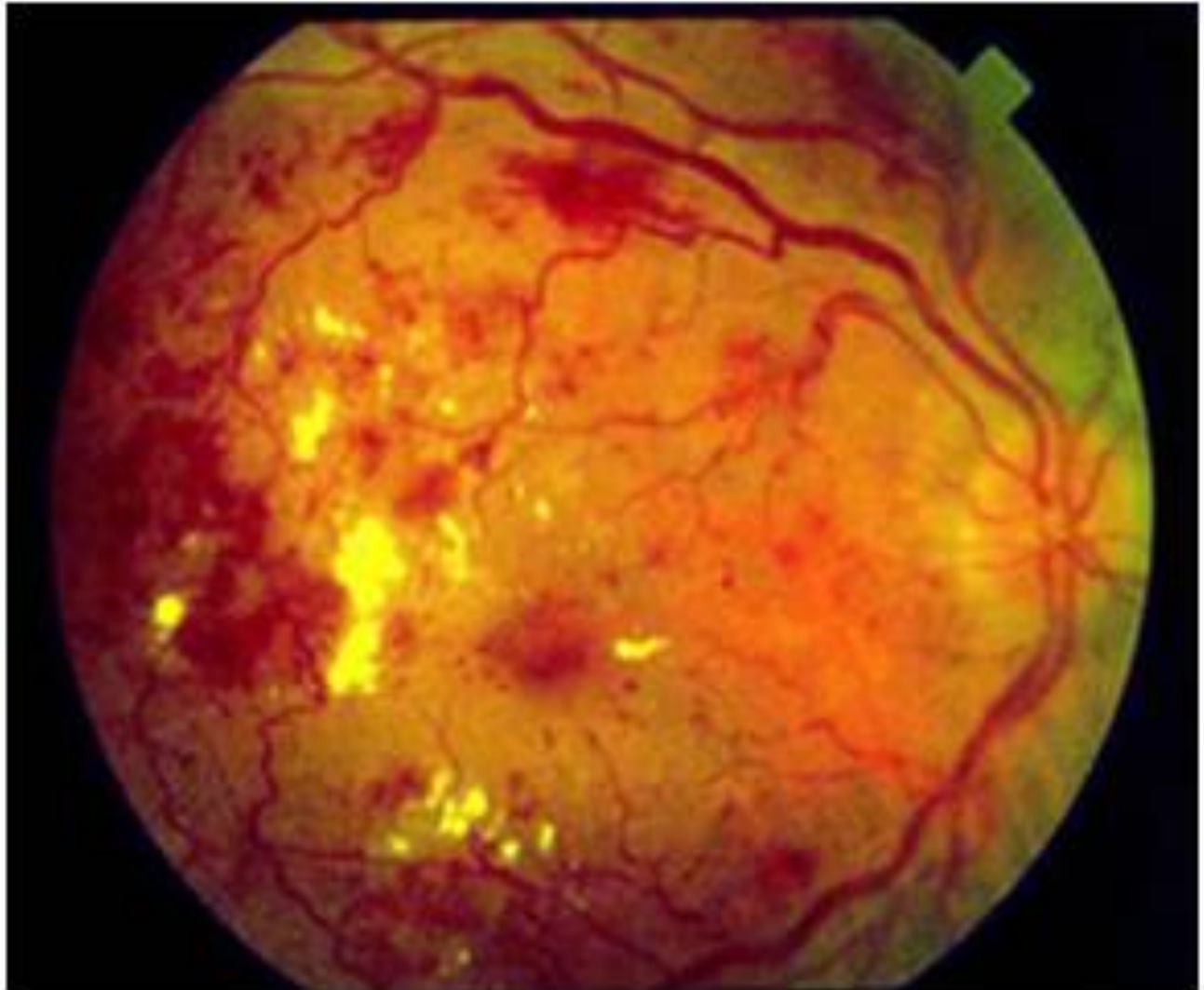
- Anti-VEGF
 - Bevacizumab (Avastin®)
 - Ranibizumab (Lucentis®)
 - Aflibercept (Eylea®)
- ADHB – 2013-2018 IVT increased **300%**



Summary

- Risk increases with age: 50+ 14% ➡ 85+ 38%
- Smoking biggest modifiable risk
- Family hx: 3 – 6x higher
- Early AMD asymptomatic
- Diet important
- Cause: unknown
- Leading cause of blindness 60+

Diabetic Retinopathy



Diabetic Retinopathy (DR)

- Most **common** cause of **blindness** and vision impairment in the age group **20 to 60** years.
- Compared to the general population, people with **diabetes** have about **25** times greater **risk** of **vision impairment**.

Diabetic Retinopathy (DR)

- At least **one-third** of people with **diabetes** have **retinopathy**.
- **10%** of people with **DR** have **sight-threatening** pathology

NZ Context

- There are over 240,000 people in New Zealand who have been diagnosed with diabetes (mostly type 2). It is thought there are another 100,000 people who have it but don't know.
- 100,000+ DR
- 10,000 Sight-threatening DR

Pathogenesis

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Capillary wall
Damage

Capillary
Closure.
ISCHAEMIA

Fibrovascular
proliferation

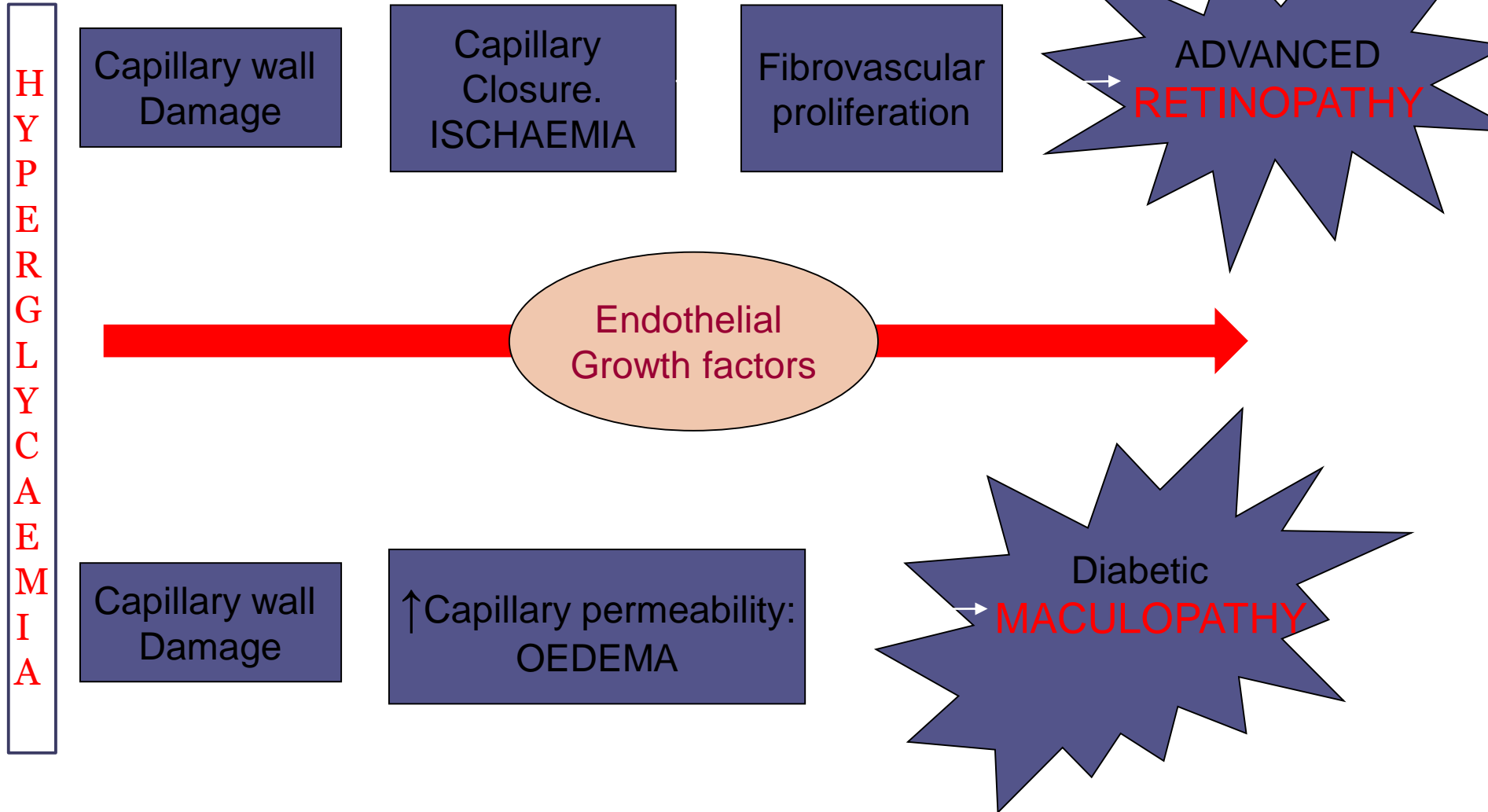
ADVANCED
RETINOPATHY

Endothelial
Growth factors

Capillary wall
Damage

↑Capillary permeability:
OEDEMA

Diabetic
MACULOPATHY



Diabetic Retinopathy

- No retinopathy
- Mild non-proliferative
- Mod non-proliferative
- Severe non-proliferative
- Proliferative

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Diabetic Maculopathy

- No maculopathy
- Non-centre involving
- Centre involving





Capillary wall
Damage



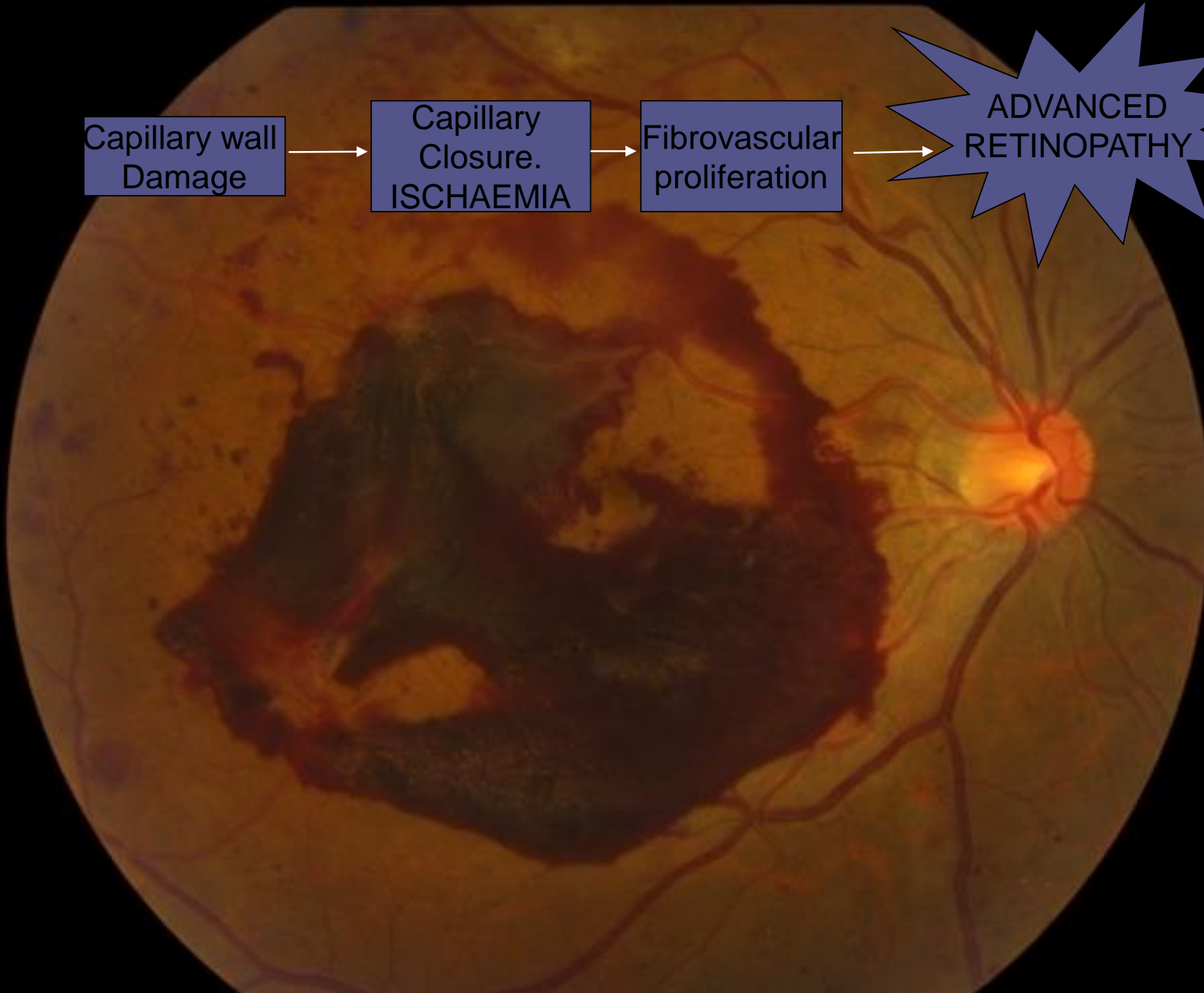
Capillary
Closure.
ISCHAEMIA



Fibrovascular
proliferation



ADVANCED
RETINOPATHY



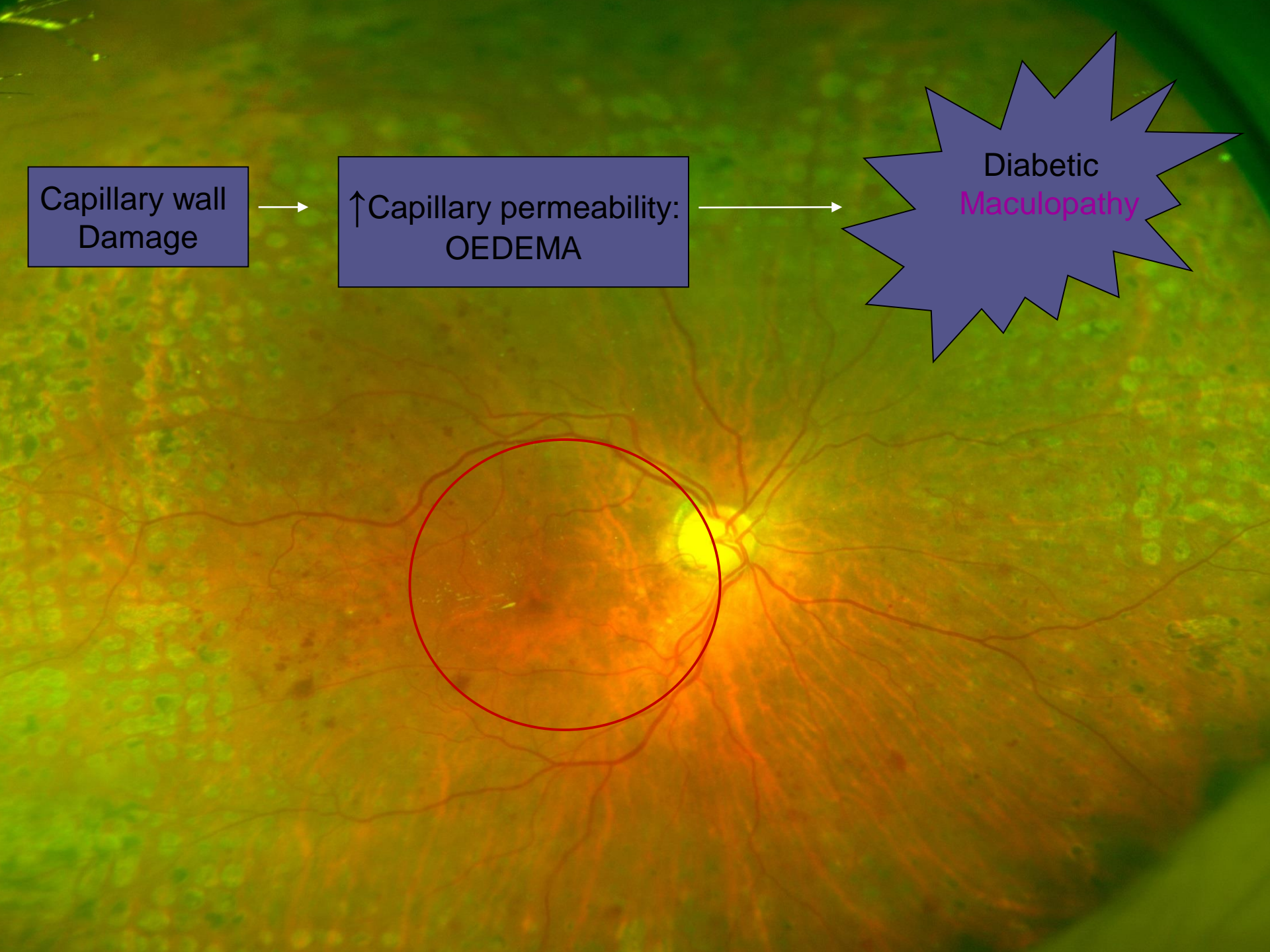
Capillary wall
Damage



↑Capillary permeability:
OEDEMA



Diabetic
Maculopathy



Risk factors for DR

- Poor blood glucose control
- Duration of diabetes
- Poor engagement with the health system
- Uncontrolled hypertension
- Renal impairment
- Non-healing foot ulcers
- Pregnancy

Primary Care and DR - Retinal Screening

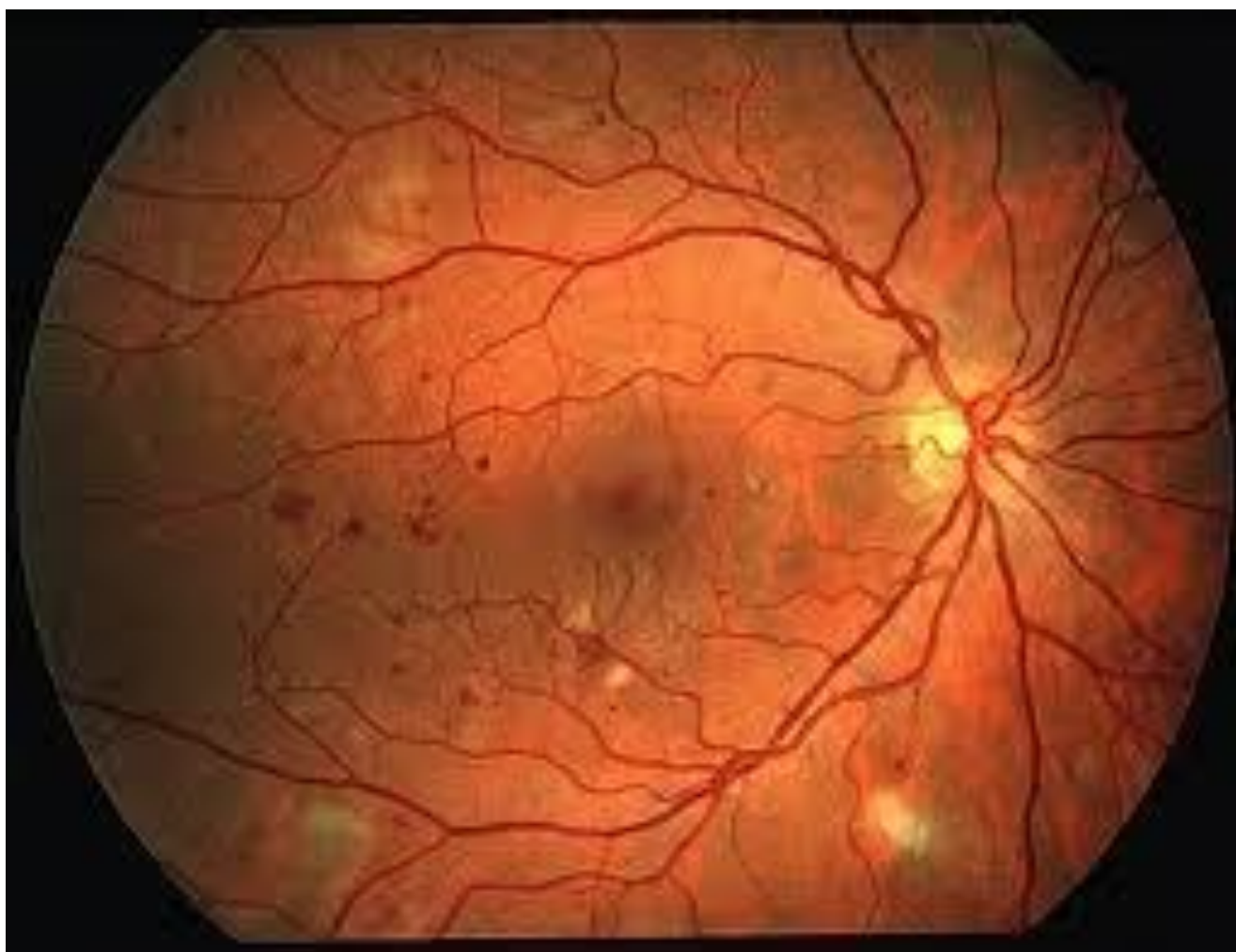
- 2 yearly screening for people with diabetes as minimum
- Identifying early microvascular complications requires managing and improving risk factors: glycaemic and hypertensive control
- Significant signs of retinopathy require prompt ophthalmology care to reduce sight-threatening retinopathy

Retinal screening

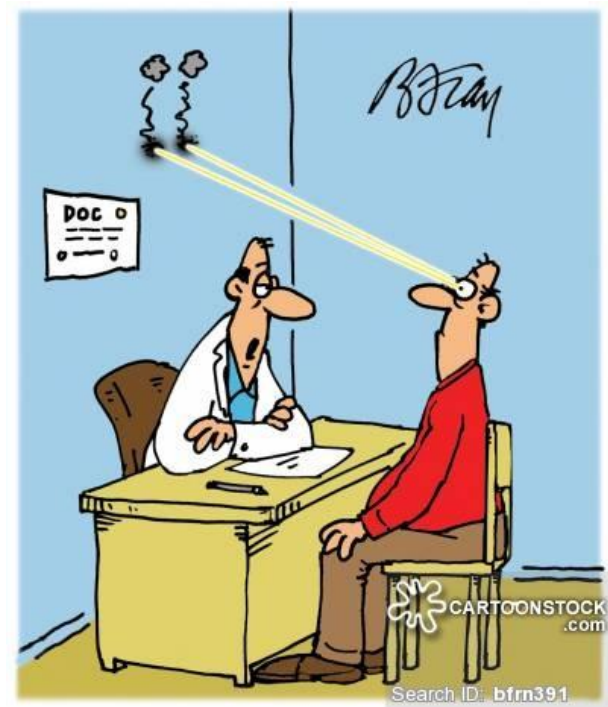
- When to refer:
 - T1 – 5 years after diagnosis
 - T2 – at time of diagnosis
 - Pregnant women with established diabetes – 1st trimester

Treatment



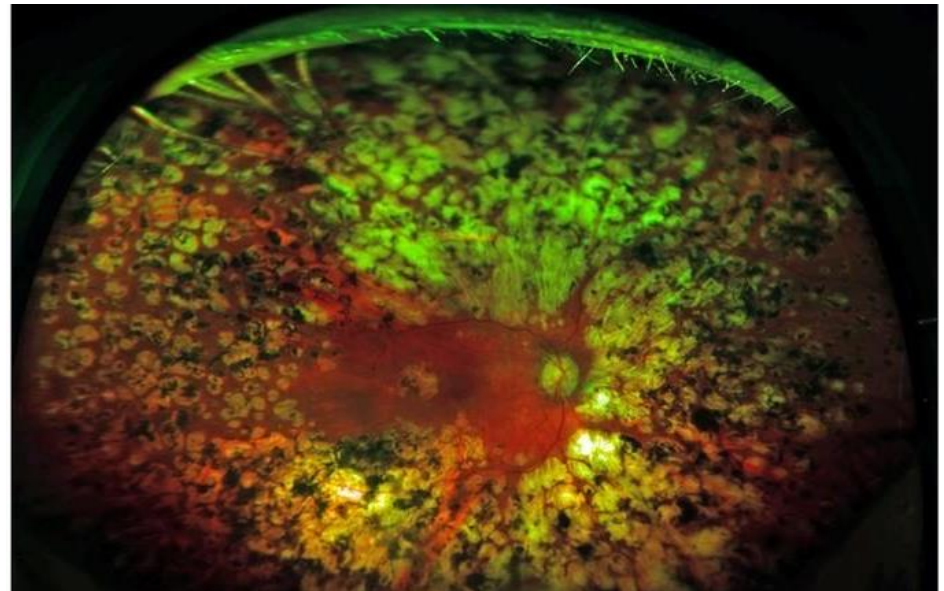
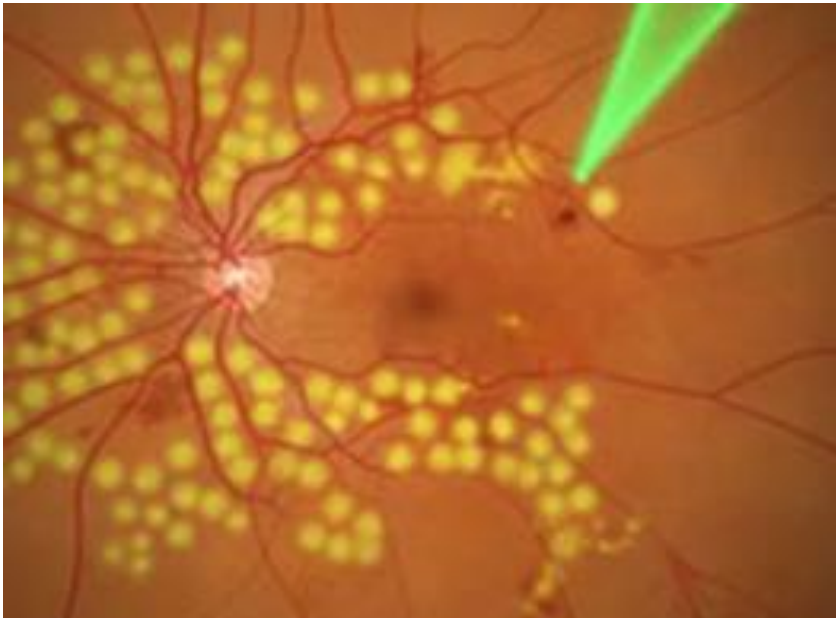


Treatment - LASER



**"WELL, YES, SOMETIMES THERE CAN BE
SIDE EFFECTS TO LASER EYE SURGERY!"**

Treatment - LASER





Treatment - ANTI-VEGF

- Given primarily for diabetic macula oedema (DMO)
- In NZ – funded for Avastin and Eylea
- May need monthly treatments till oedema settles



Treatment - Steroid

- Given primarily for DMO not responding to Anti-VEGF
- Requires less frequent injections of Anti-VEGF
- Risks: cataract formation, raised intraocular pressure



Treatment - Vitrectomy surgery





Summary

- DR is often asymptomatic
- Regular retinal screening **essential**
- Two sight-threatening pathways: proliferative retinopathy and maculopathy
- Leading cause of working-age blindness
- Eminently treatable with regular screening
- Education key

Save Sight Society <http://www.savesightsociety.org.nz>
<https://bpac.org.nz/bpj/2010/august/retinopathy.aspx>