

Public Health and clinical Management of Diabetic Retinopathy.

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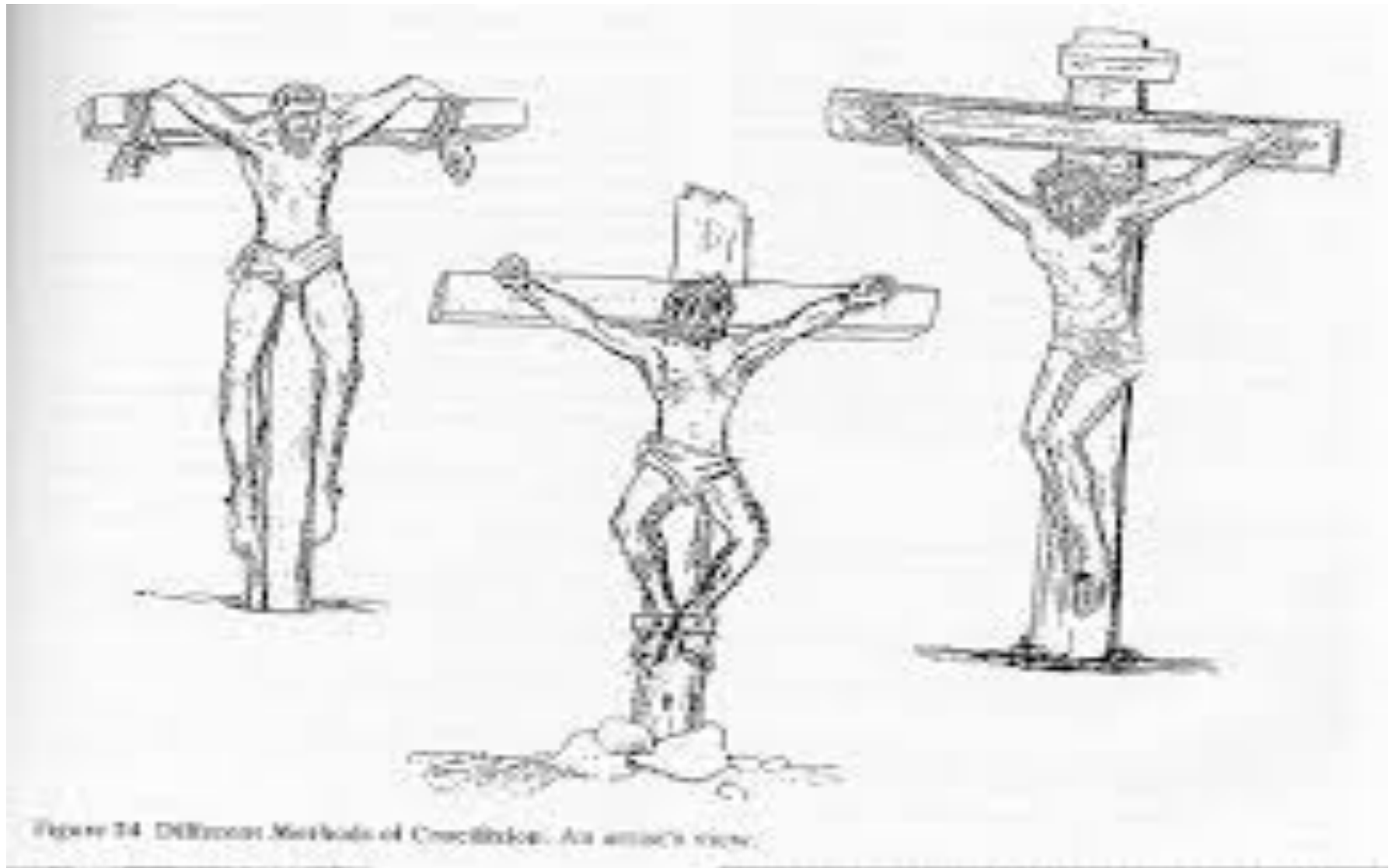
Yenagoa & Port Harcourt.

Chair, BYS Eye Health Committee

DISCLOSURES

- No Financial Interest in any products mentioned in this talk.

Crucifixion: Cause of death?



Introduction

- Public health is the science and art of promoting and protecting health and well being, preventing ill-health and prolonging life through organised efforts of society.
- PH brings a population perspective to our understanding of a condition.
- Considers the impact of a condition in a population rather than an individual.
- Develops and implements interventions for populations to improve outcomes.

Diabetes Mellitus

- Defined as a metabolic disorder of multiple aetiologies, characterised by chronic hyperglycaemia with disturbances of carbohydrate, protein and fat metabolism resulting from defects of Insulin secretion, Insulin action or both.

Epidemiology of DM

- National Prevalence of type 2 DM 4.3% [WHO country report 2016]
- Varies in different regions of the country
- South-South region 9%
- 1:3 diabetics develop eye complications
- Insulin Resistance more common in Afro-caribbean.
- Type 2 DM occurs earlier in amongst Nigerians (<50yrs)
- Co-morbidities higher in African patients.

Disease burden

- Increased morbidity [x2 hospitalisation rate]
- Susceptible to viral infections
- 25% of medical beds taken up
- >700 DM patients die prematurely every week
- 185 Amputations of either the leg, foot or toe every week.
- 1700 severe visual loss yearly [UK]

Diabetic Retinopathy

- Chronic progressive, potentially sight threatening disease of the retinal microvasculature, associated with hyperglycaemia and other conditions linked to diabetes mellitus such as hypertension.

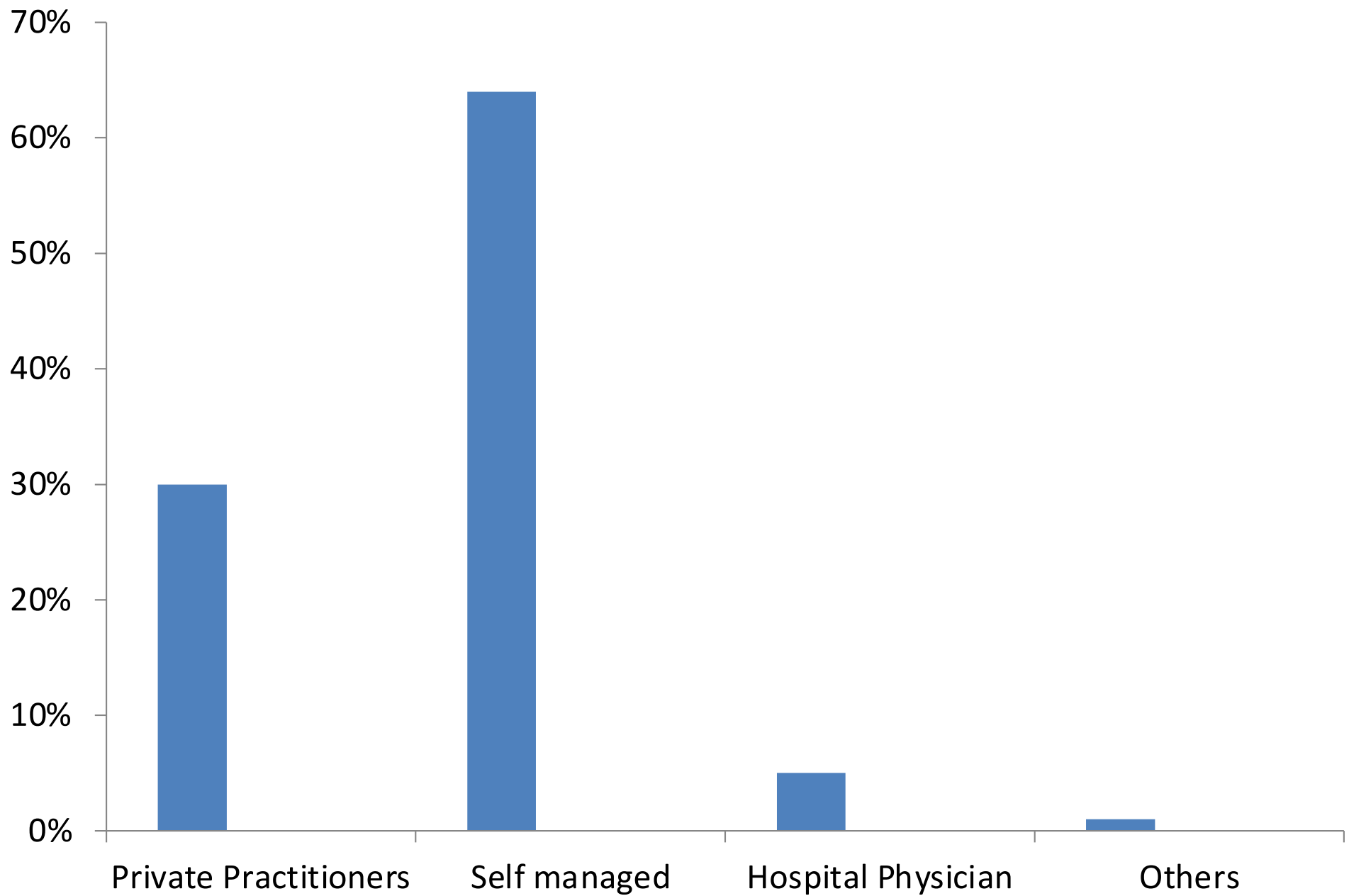
Burden of Diabetic Retinopathy

Quality of Life

- DR has a negative impact on quality of life especially in late stages made worse by co-morbidities such as renal disease and hypertension.
- DM commonest cause of visual loss in working age.
- The PH impact measured by disability adjusted life years(DALYs) by the WHO. Used to quantify non-fatal outcomes of disease.
- A UK study reported 11,300 DALYs from blindness due to DR.

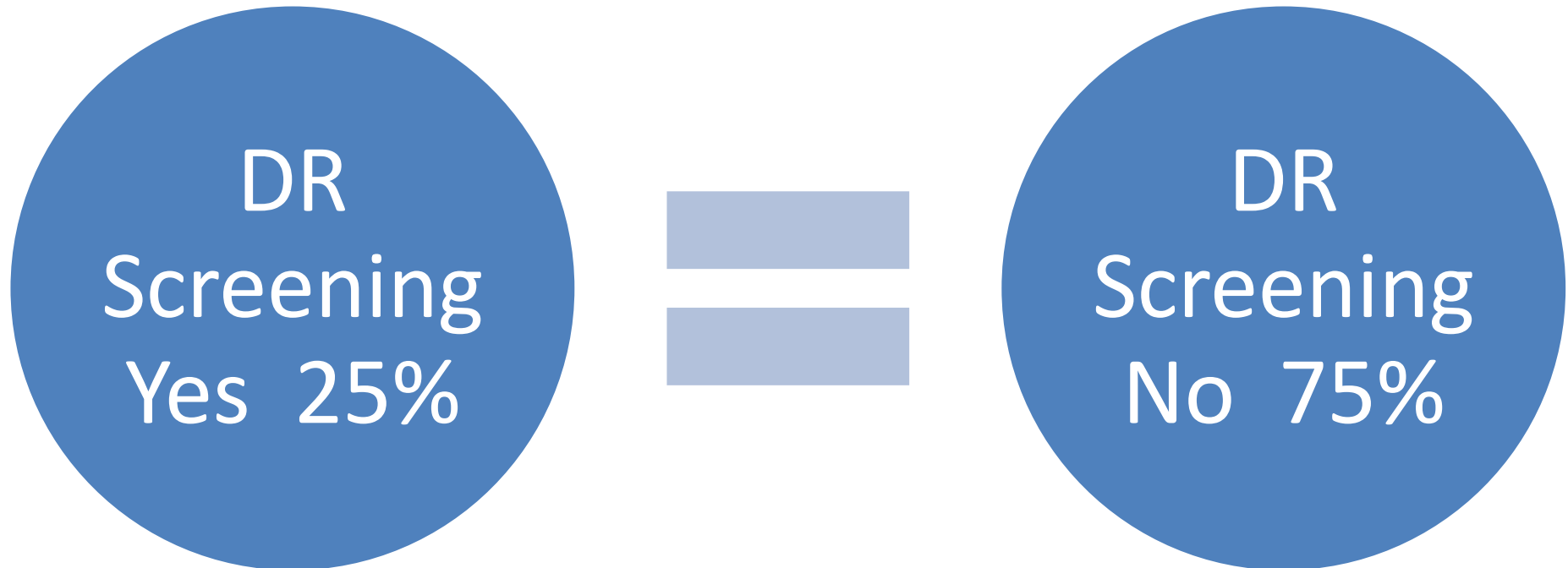
Socioeconomic

- Deprivation adversely affects Type 2 diabetes.
- Prevalence of DR increases with increased deprivation
- Ignorance.
- Low educational level
- Low income
- Low occupational status.



Percentage of diabetics cared for by various professionals

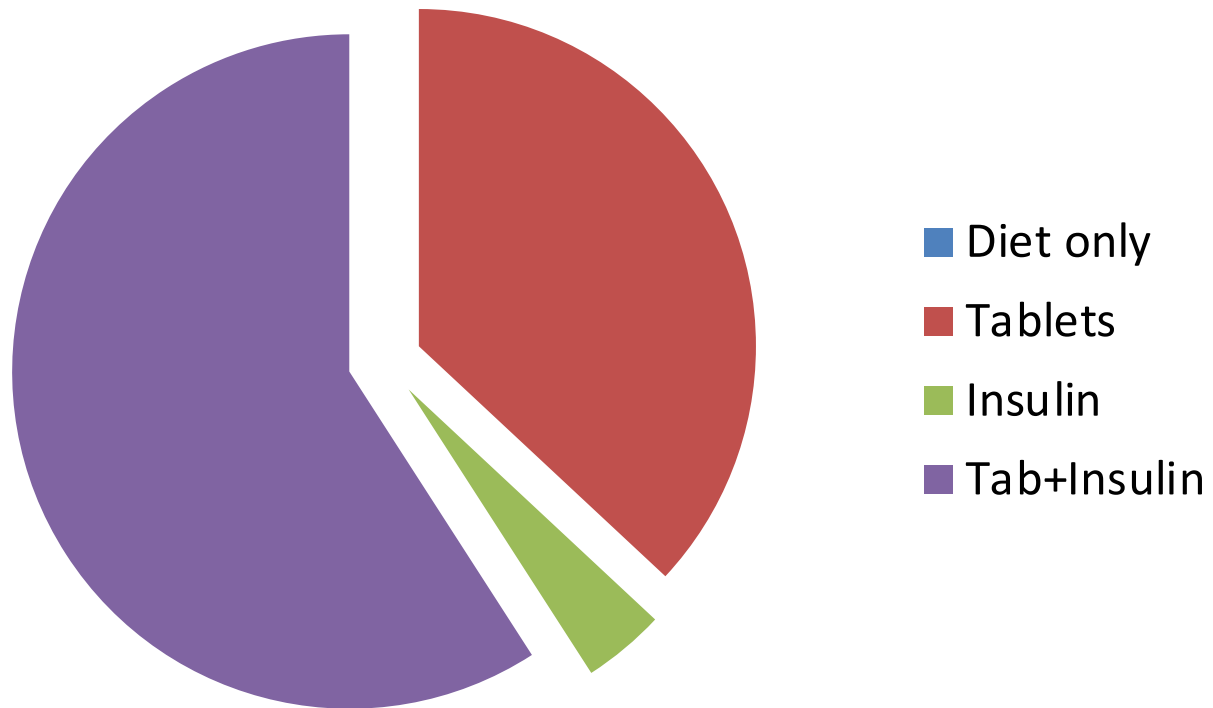
Diabetes survey 2021



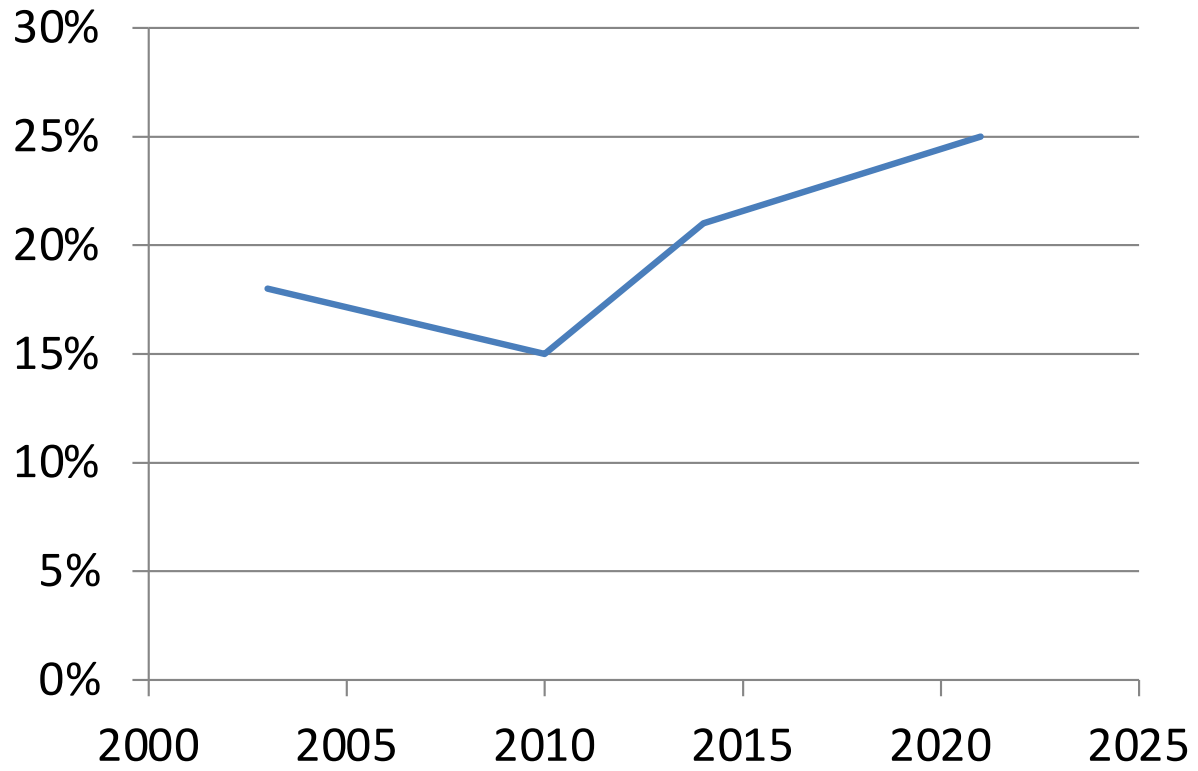
Diabetes Survey

- Only 20% had had foot screening.
- 2/3rds had not seen a dietician.
- 55% sometimes felt fed up about being diabetic.
- 30% felt it affected their mood.
- All had self test kits at home.
- 90% had hypertension.
- 40% alluded to having Insomnia.

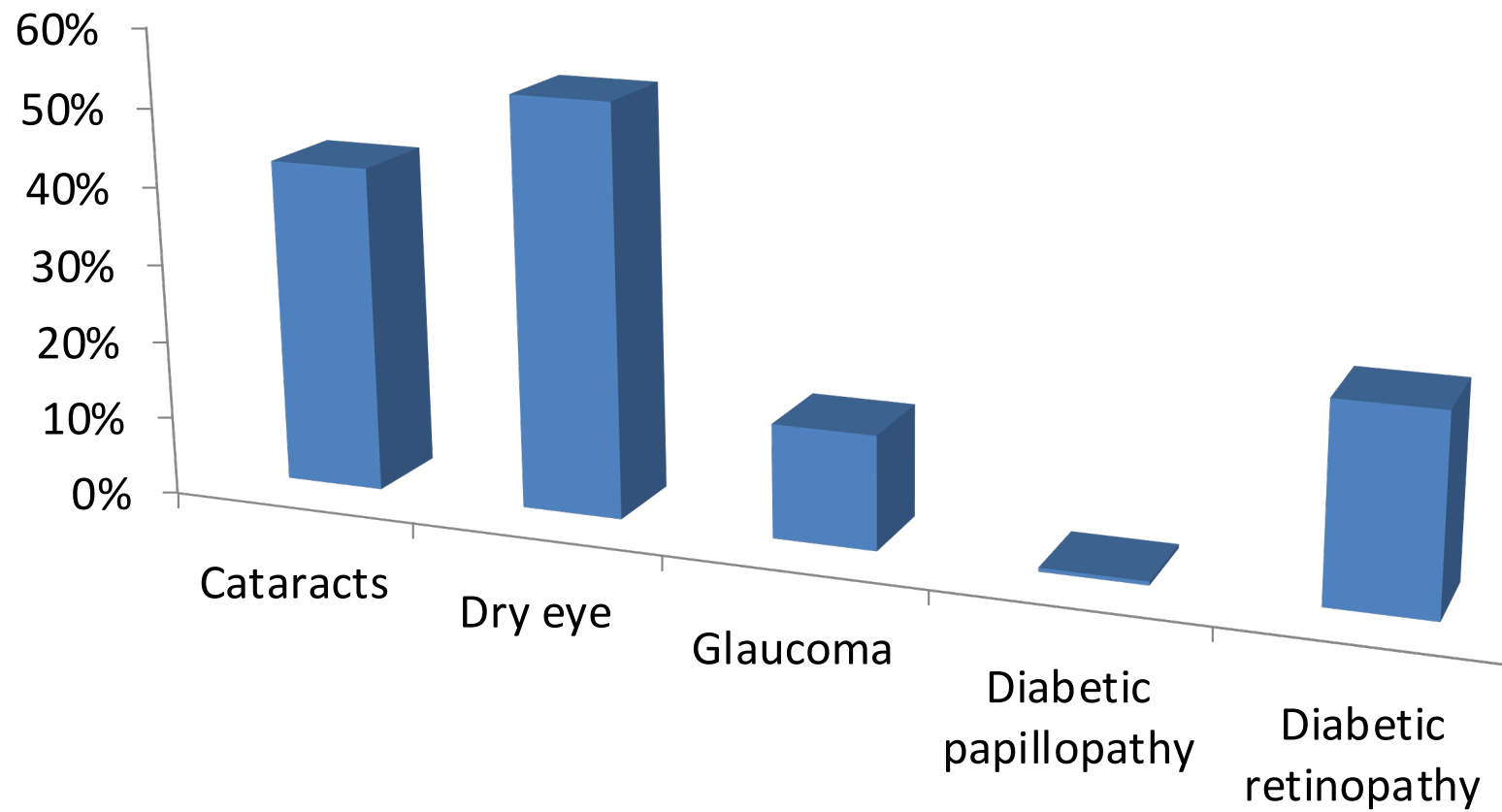
Diabetic control



%



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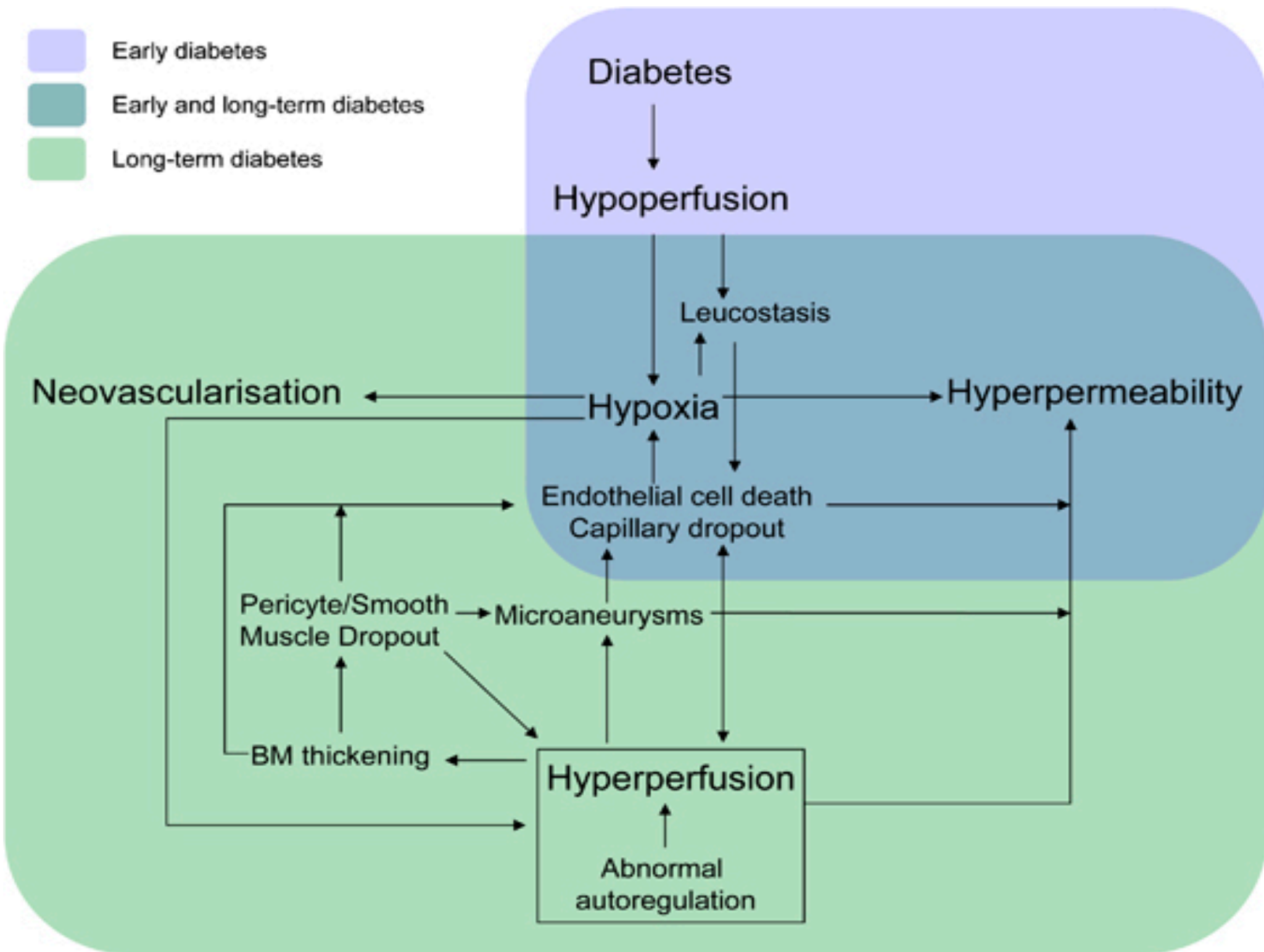


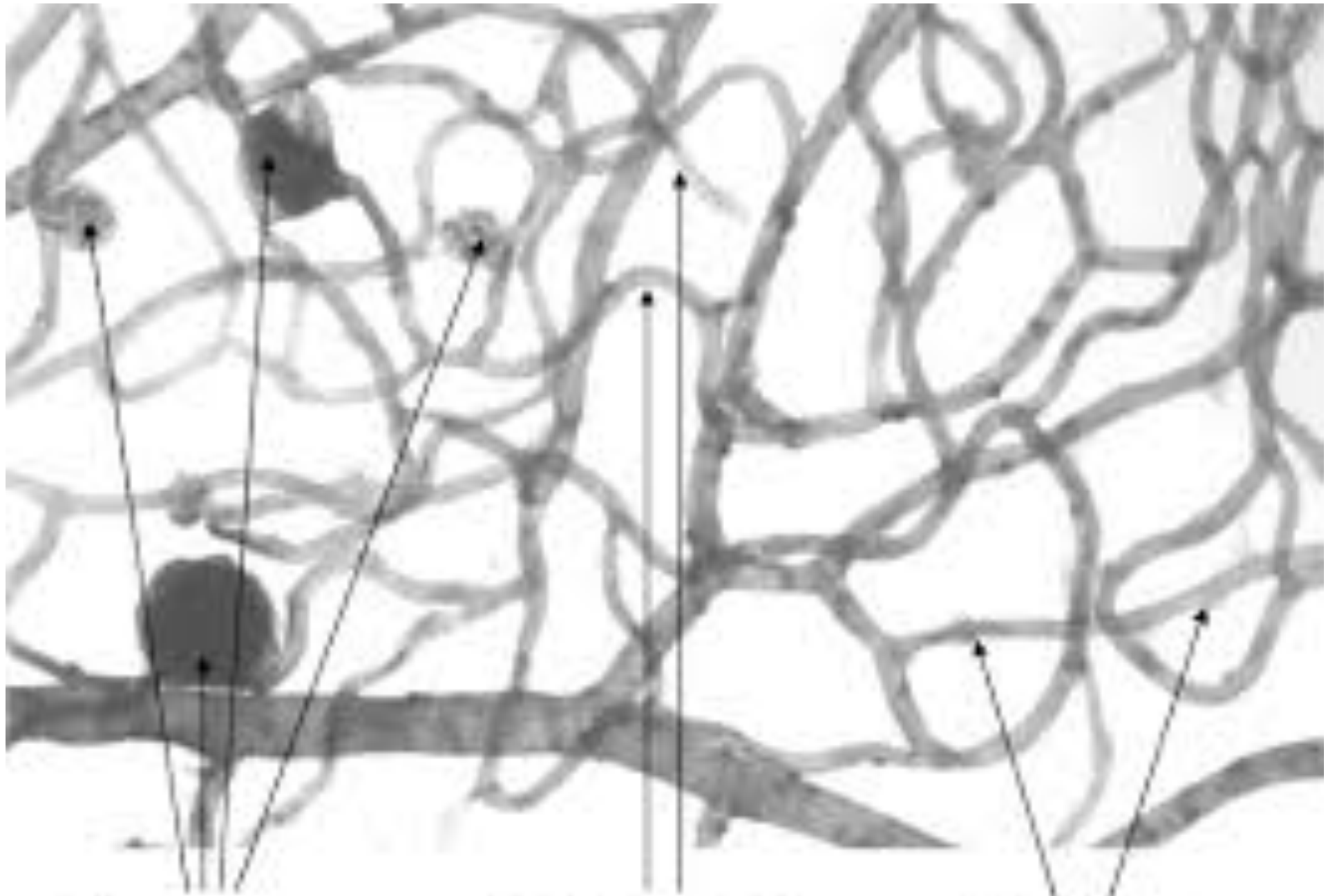
Complications of diabetes

Pathogenesis of Retinopathy

- High Glucose levels.
- Damage and loss of Intramural Pericytes.
- Loss of auto-regulatory function of capillaries.
- Saccular out-pouchings of the capillaries.
- Vascular permeability.
- Retinal and Macula Oedema.
- Vascular closure results in Ischaemia.

- Early diabetes
- Early and long-term diabetes
- Long-term diabetes

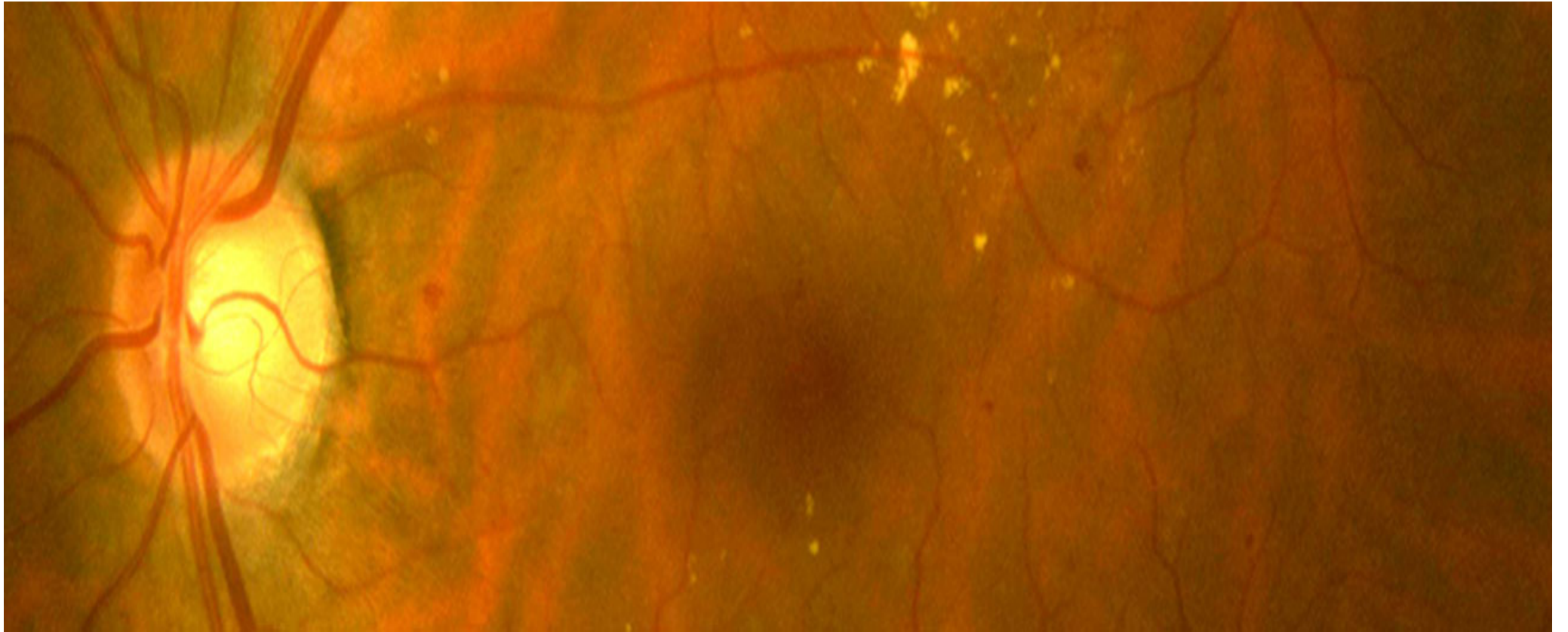


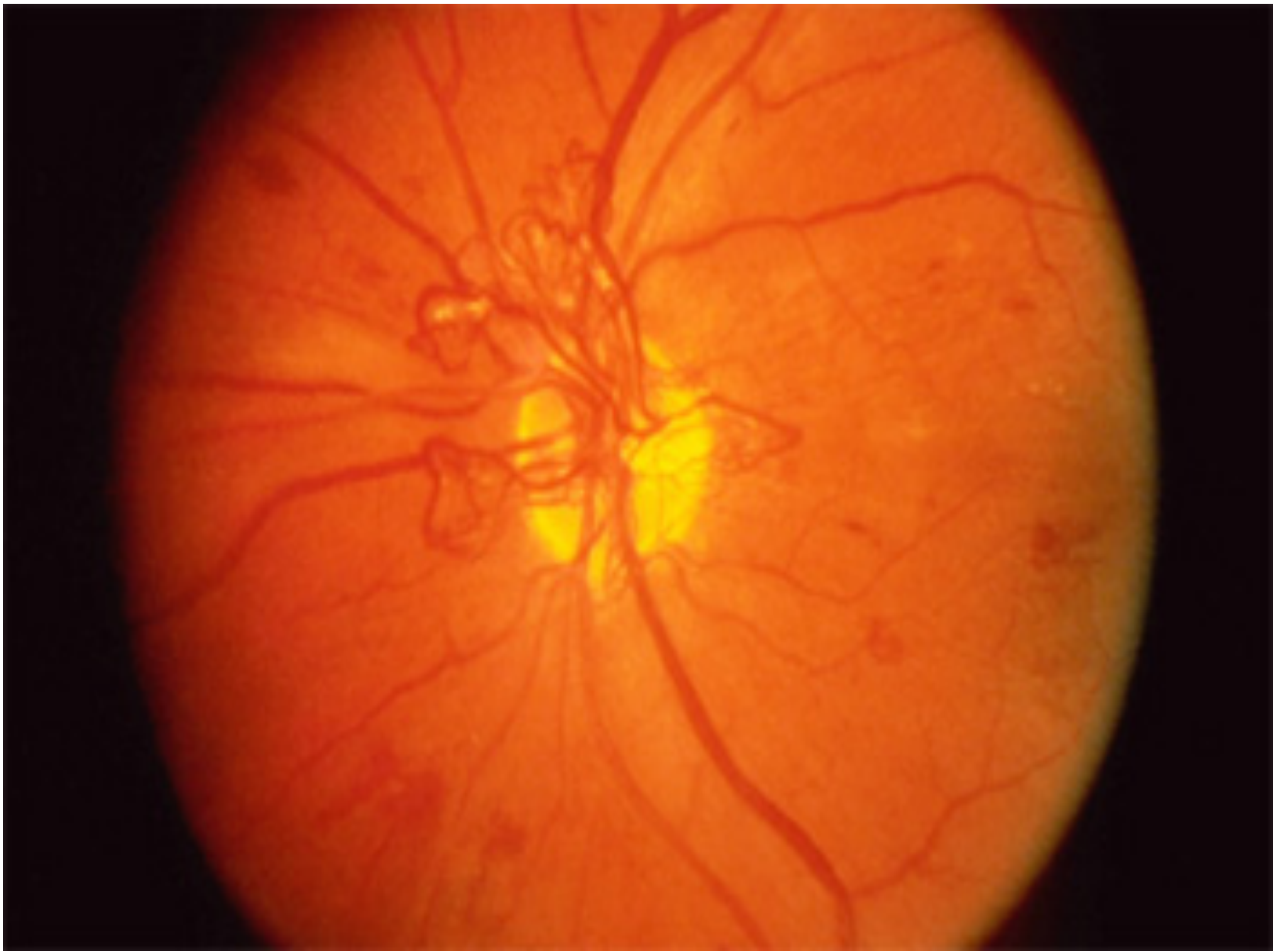


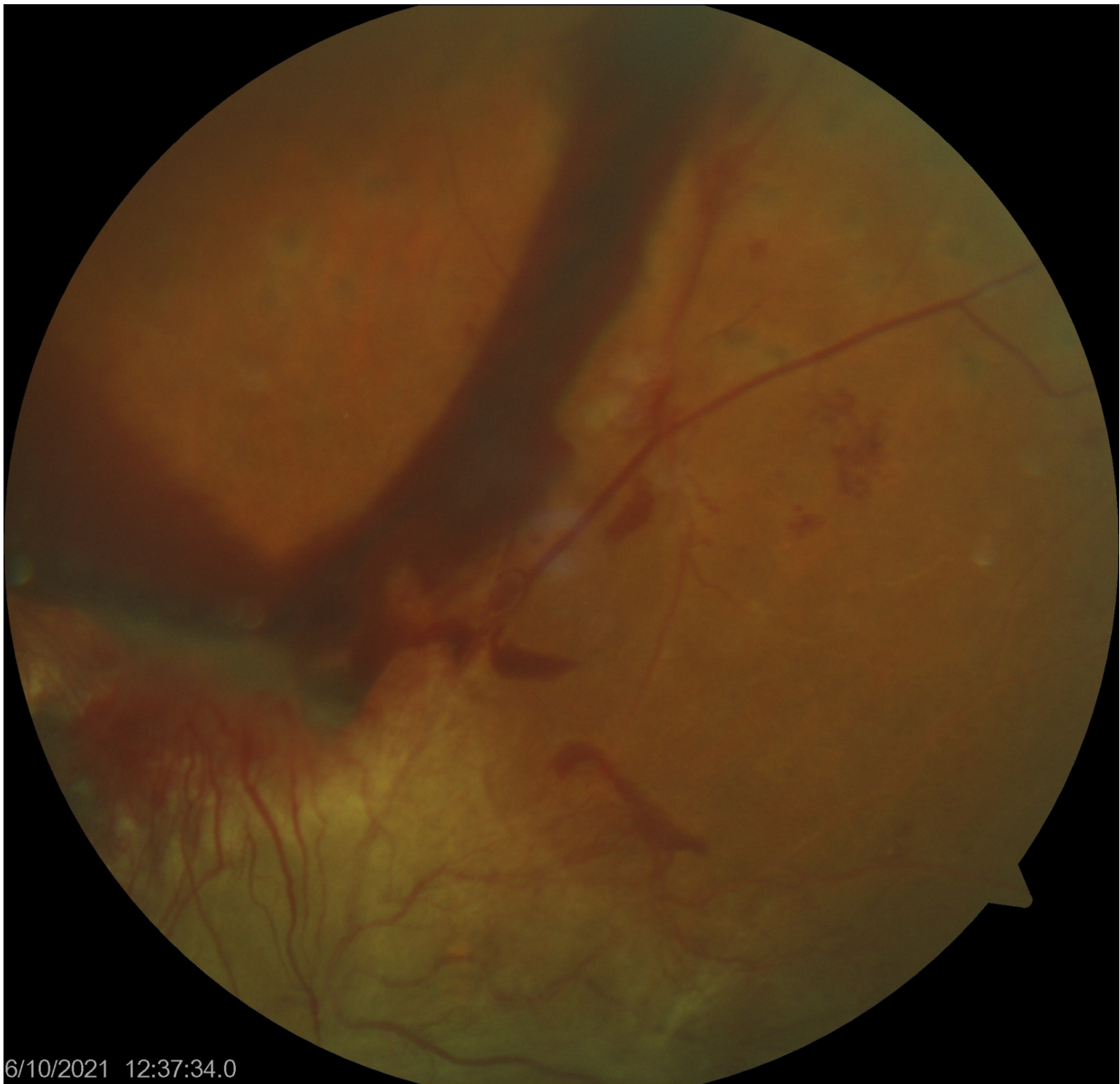
Microaneurysms

Acellular capillaries

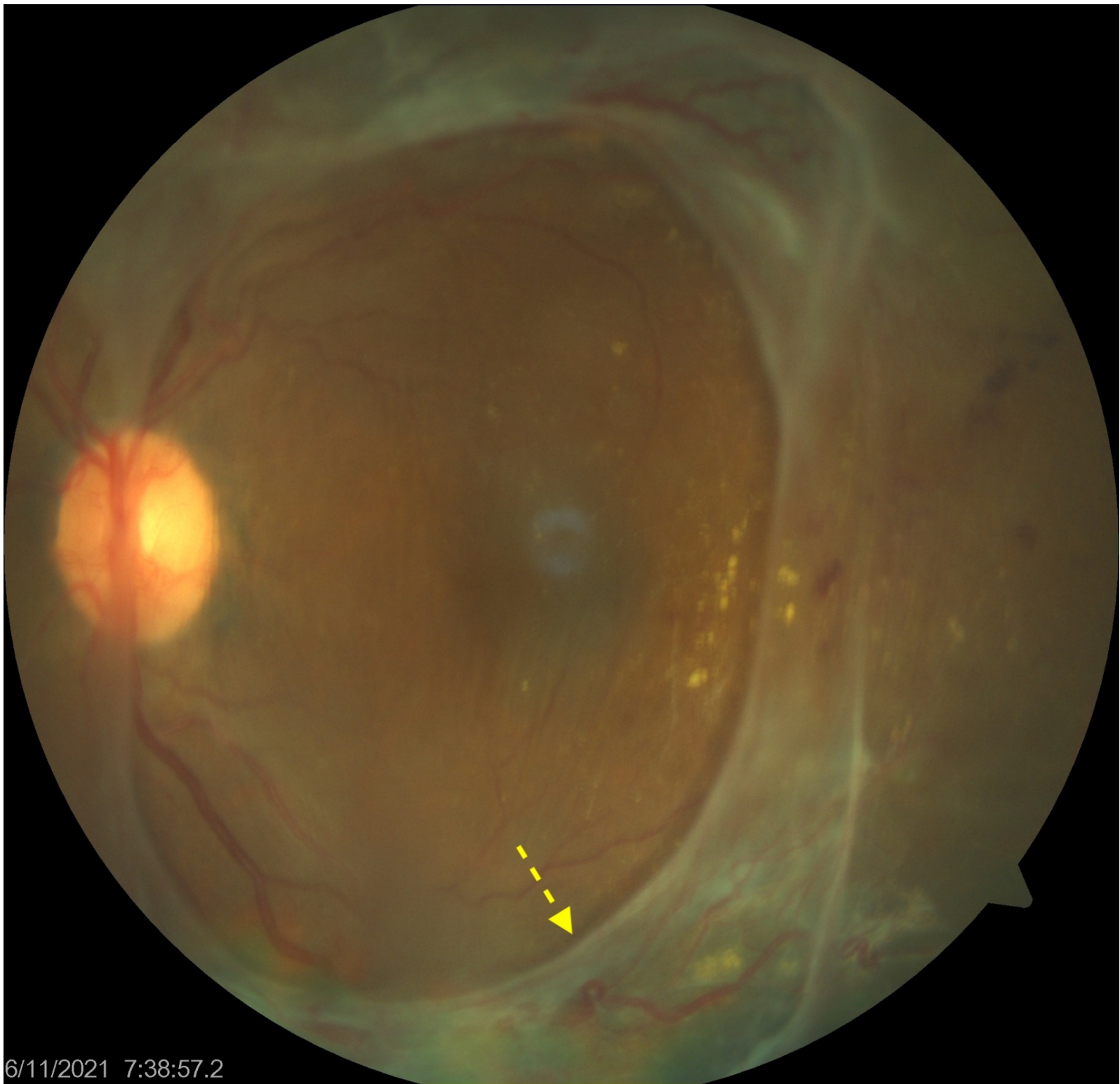
Pericyte ghosts







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Macula Oedema.

- Retinal thickening within 2 disc diameters of the centre of the macula.
- Maybe diffuse, focal, ischaemic or Mixed.
- Due to breakdown of the BRB and leakage of plasma into surrounding retina.
- Focal oedema due to MA leakage.
- Diffuse type caused by MAs, capillaries and arterioles.

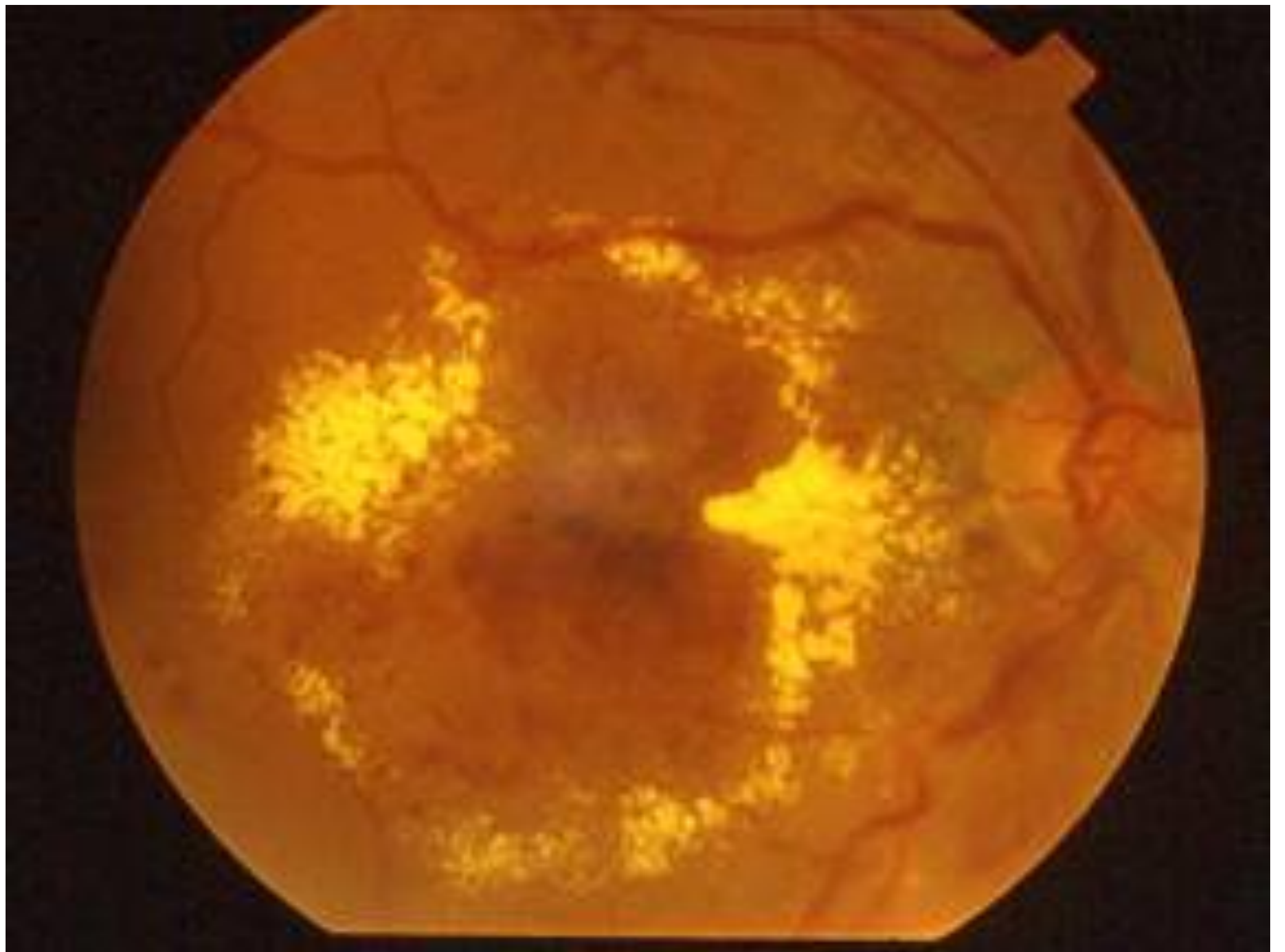
Maculopathy

Features

- Any thickening within 500µms of the centre of the fovea.
- Presence of hard exudates within 500µms of the fovea.
- 1 disc diameter thickening within the macula.

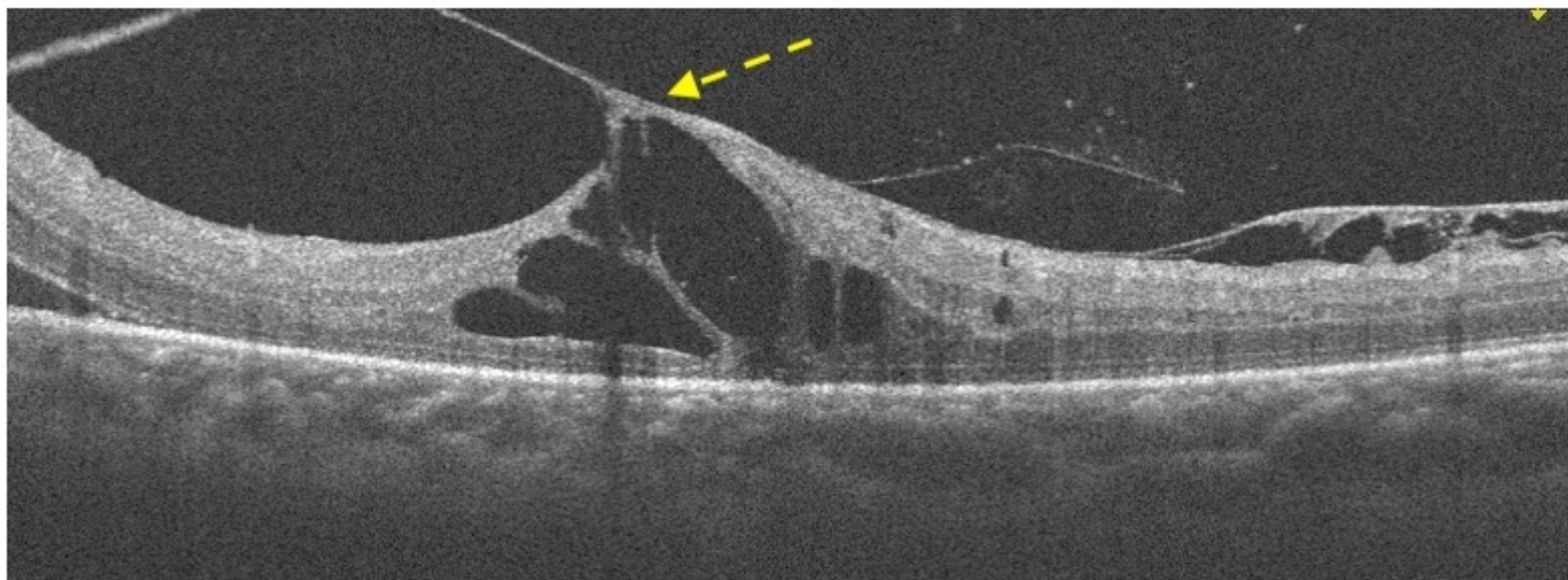
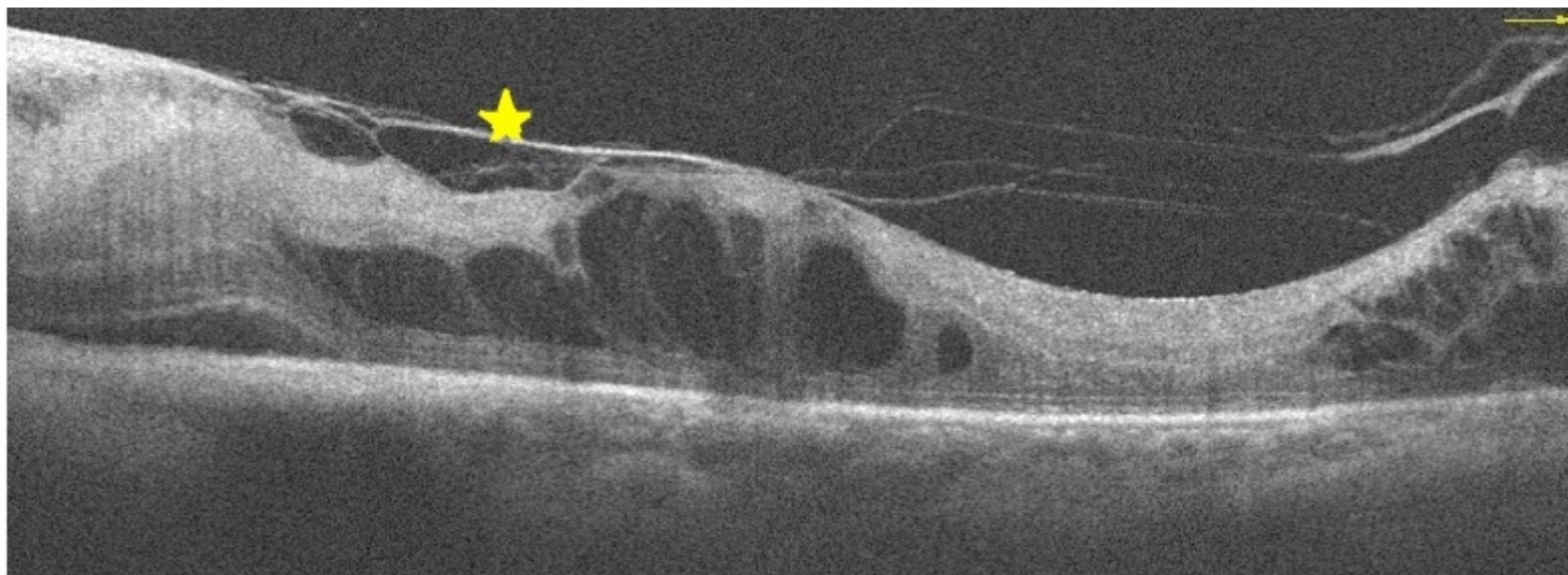
Investigations

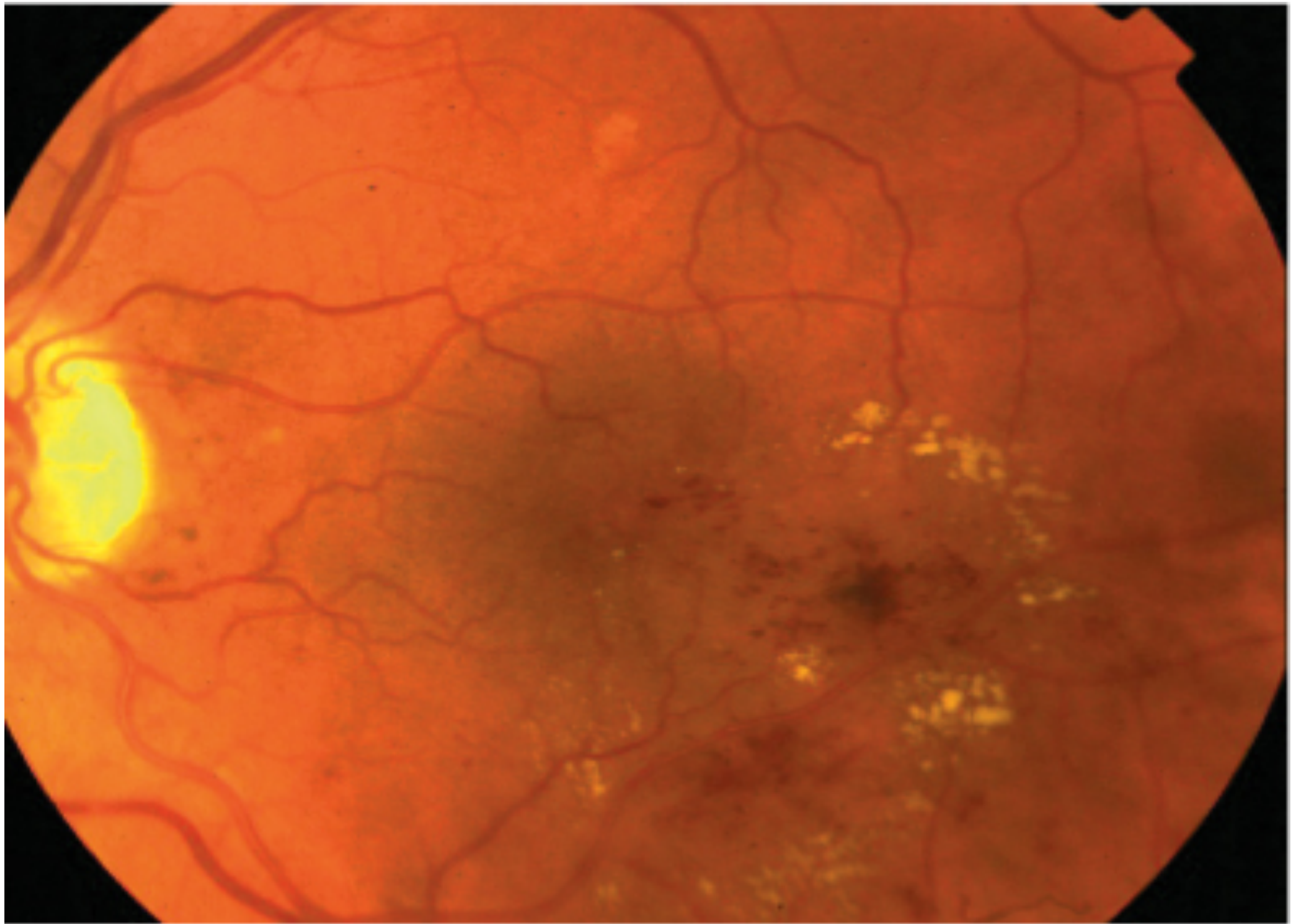
- OCT
- Fluorescein Angiography.
- Colour photographs.
- Slit lamp Biomicroscopy
- 78D,90D or Fundus lens.

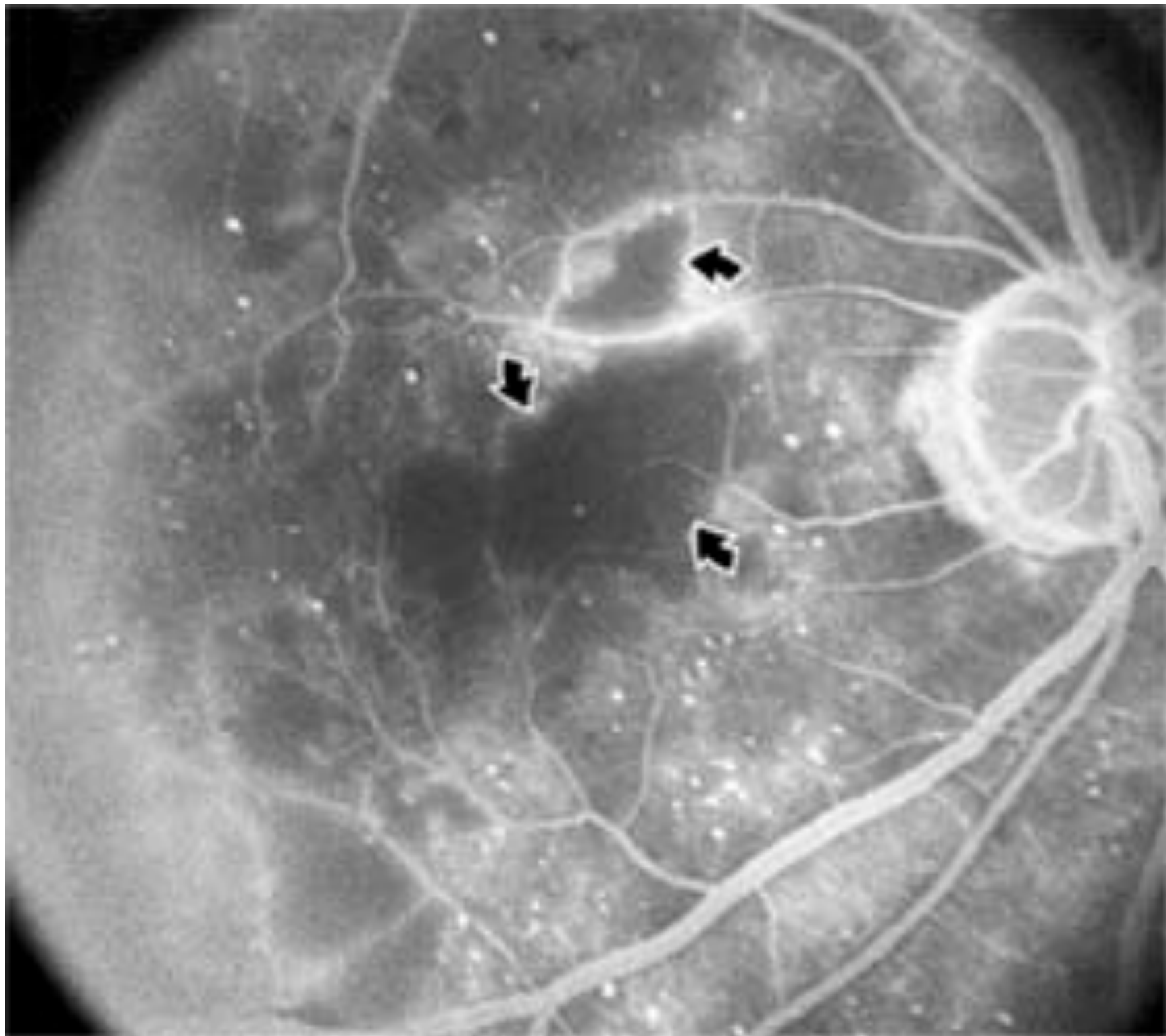




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Management.

- Good control of glucose levels.
- DR Risk calculation online.(riskafrica.co.za)
- Annual screening of all type 2 diabetics.
- Refer to eye specialist or optometrist.
- All type 1 diabetics of 5 years duration.
- Anti-VEGF Injections into the eye.
- Laser Treatment.
- Regular follow up.

Treatment of DMO.

- Vascular Endothelial Growth Factor (VEGF) levels are elevated in the vitreous and retina in DR patients.
- VEGF increases permeability by affecting tight junction proteins, and therefore oedema.
- Managed Anti-VEGFs.
- Steroids.
- Laser photo-coagulation .

Anti-VEGF.

- Inhibit interaction b/w VEGF and receptors on the endothelial surface.
- Effect of retarding growth.
- Includes Ranibizumab
- Bevacizumab
- Pegaptanib
- Aflibercept.

Ranibizumab

- Marketed as Lucentis.
- Humanised monoclonal ab fragment.
- Specifically for use in the eye.
- Binds and inhibits all isoforms of VEGF-A
- Dose 0.5mg in 0.05ml



Leaking
blood vessel

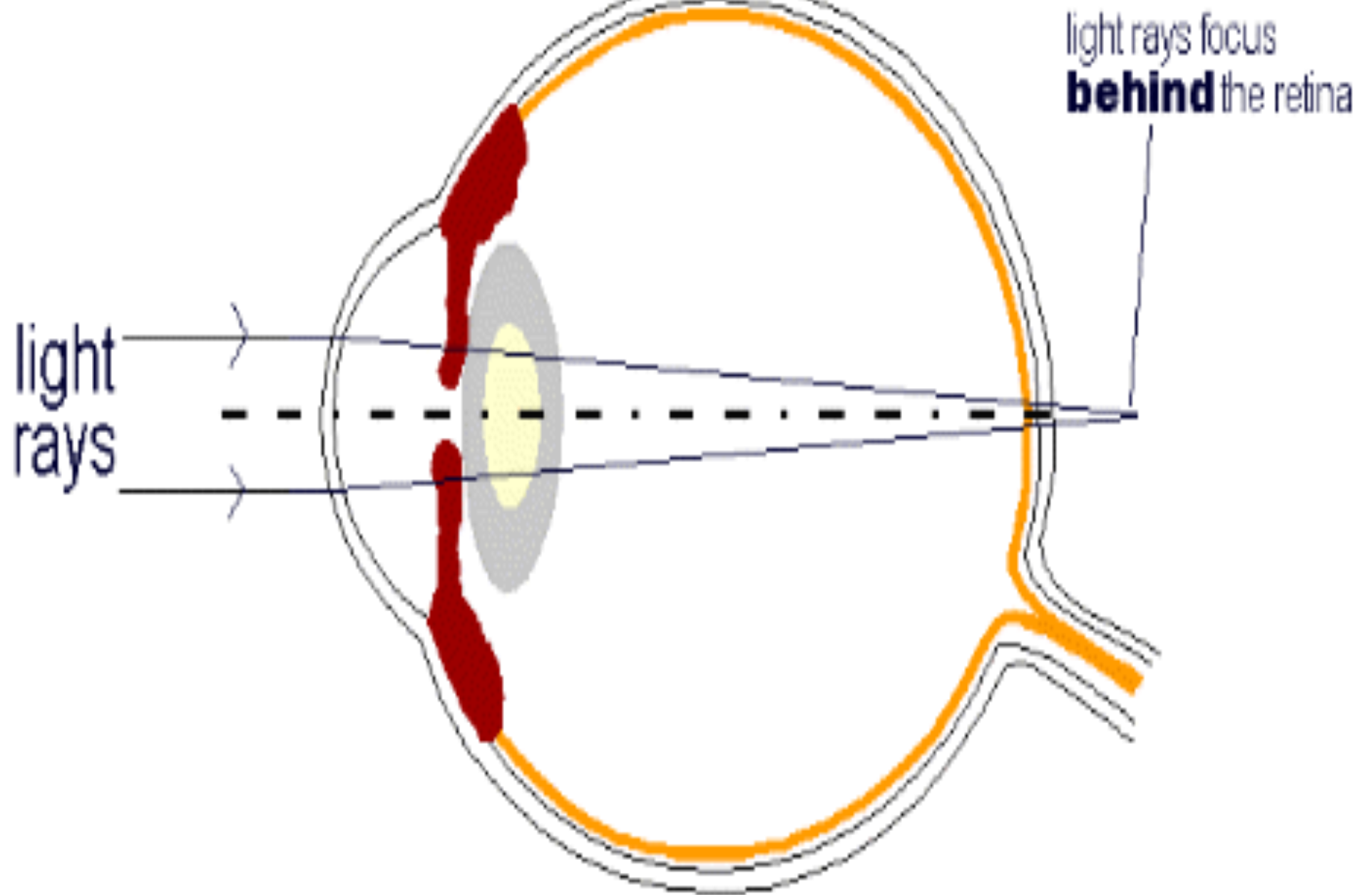


Treatment strategy.

- 3 Initial monthly injections. Review patient monthly. May need further therapy.
- Treat and extend approach. 3 initial monthly injections. Then gradually extend the interval between treatment until patient deteriorates.









Snow flake cataract.

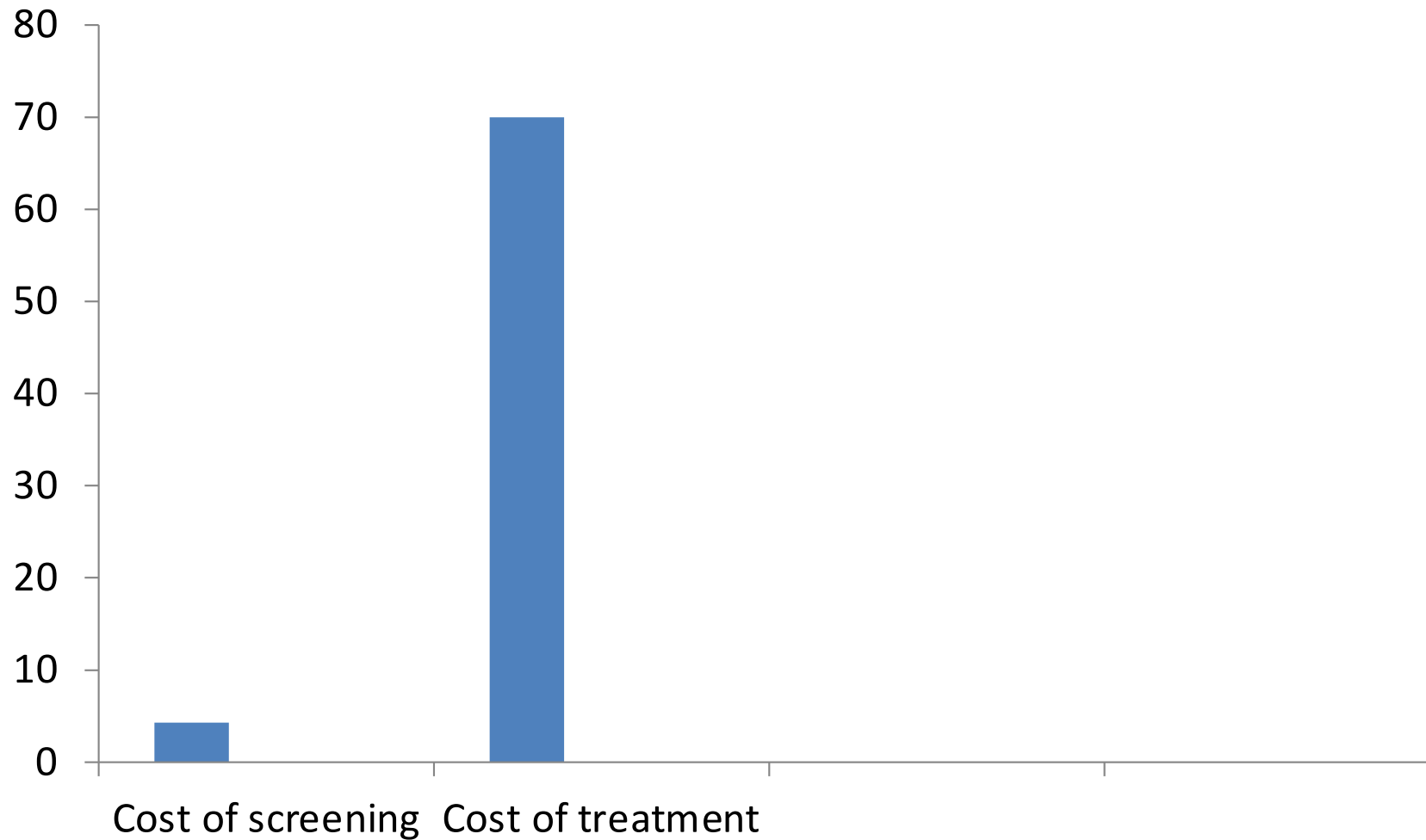
Mainly in young diabetics especially in severely uncontrolled cases.

CONCEPT OF SCREENING

- WHO in 1968 defined screening as presumptive identification of unrecognised disease or defect by the application of tests, examinations which can be applied rapidly.
- The St Vincent Declaration in 1989 set a target to reduce new blindness by a third within 5 years.
- Many countries subsequently set up structured screening strategies and over the years have seen a reduction in the incidence of diabetic eye disease.
- Population based approach to reduce a particular disease prevalence.

Principles of screening

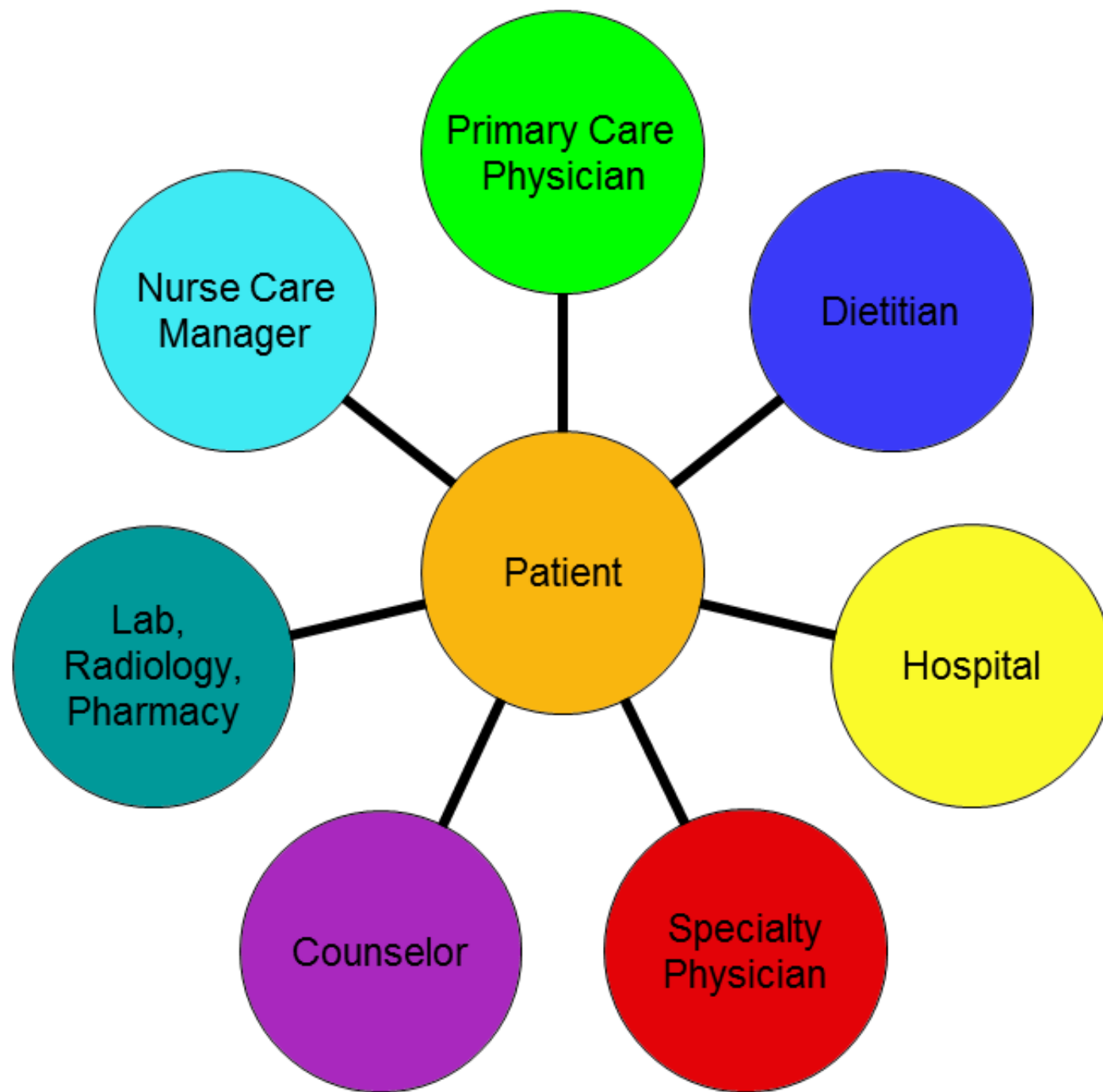
- The condition sought should be an important problem.
- Accepted treatment for patients.
- Facilities for diagnosis
- Recognizable early or latent symptoms
- Suitable tests available to detect condition.
- Tests should be acceptable to population.
- Understanding of the natural history .
- Agreed policy on whom to treat
- Cost effective.
- Case finding should be a continuing process.



Comparison of cost of prevention/screening to cost of treatment

Eligible Population.

- Aware DM is chronic disease and lifelong.
- Ask patient about visual problems.
- Refer all children with diabetes for >5yrs.
- Refer all children aged > 10yrs
- All teenage diabetics especially 16/17yr olds.
- All adults IDDM and NIDDM.
- Early detection of eye complications is the key to successful management.



Impediments to screening

- Staff shortage
- Lack of time
- Poor or absent equipment such as ophthalmoscope.
- Lack of skills
- De-skilling of doctors.
- Reluctance to educate and refer patients
- Physical and financial burden on patient to attend another site

**SCREENING
STRATEGY.**

Physicians.

Private clinics

Health centres

- Build a database of all diabetics in the district.
- Diabetic centres.
- Opportunistic screens.
- Annual exercise.
- Low tech approach.
- Optometric involvement.
- Grading of lesions by ophthalmologist.

Retina Risk.

- APP Available online.
- Calculates the patients risk of developing DR.
- Measures over 5 year period.
- Considers Gender, duration and type of Diabetes, Blood pressure and HbA1c levels.
- Easy tool for General Practitioners.
- Refer anyone over 20% risk.



200 Ft.
0.10

E

1

100 Ft.
0.20

F P

2

70 Ft.
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T O Z

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50 Ft.
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25 Ft.
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20 Ft.
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15 Ft.
1.33

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9

13 Ft.
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Summary

- DM major PH issue and rising.
- Eye complications preventable
- DR related to systemic control
- Refer even normal diabetics for screening
- ANPMP members have a major role .
- Advocacy by way of posters in the clinic.

Crucifixion

- Roman method of capital punishment
- Fastened by wrists and ankles
- Arms take the weight, leading to constriction and asphyxiation.
- Akin to being crushed in a crowd or have a weight placed on the chest.
- Bp <50% , Syncopy, within 10mins unconsciousness, and death within hours.

THANK YOU.