



Age-related macular degeneration

Age-related macular degeneration (AMD)

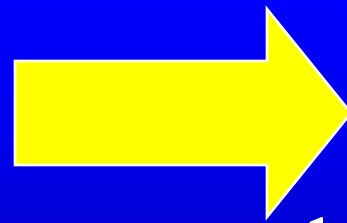
- The most common cause of blindness in developed countries

Age-related macular degeneration (AMD)

- AMD is multifactorial disease caused by combination of predisposing genes and influences of external environment

Classification of AMD

➤ Dry form of
AMD



drusen, RPE
changes,
geographic
atrophy of RPE

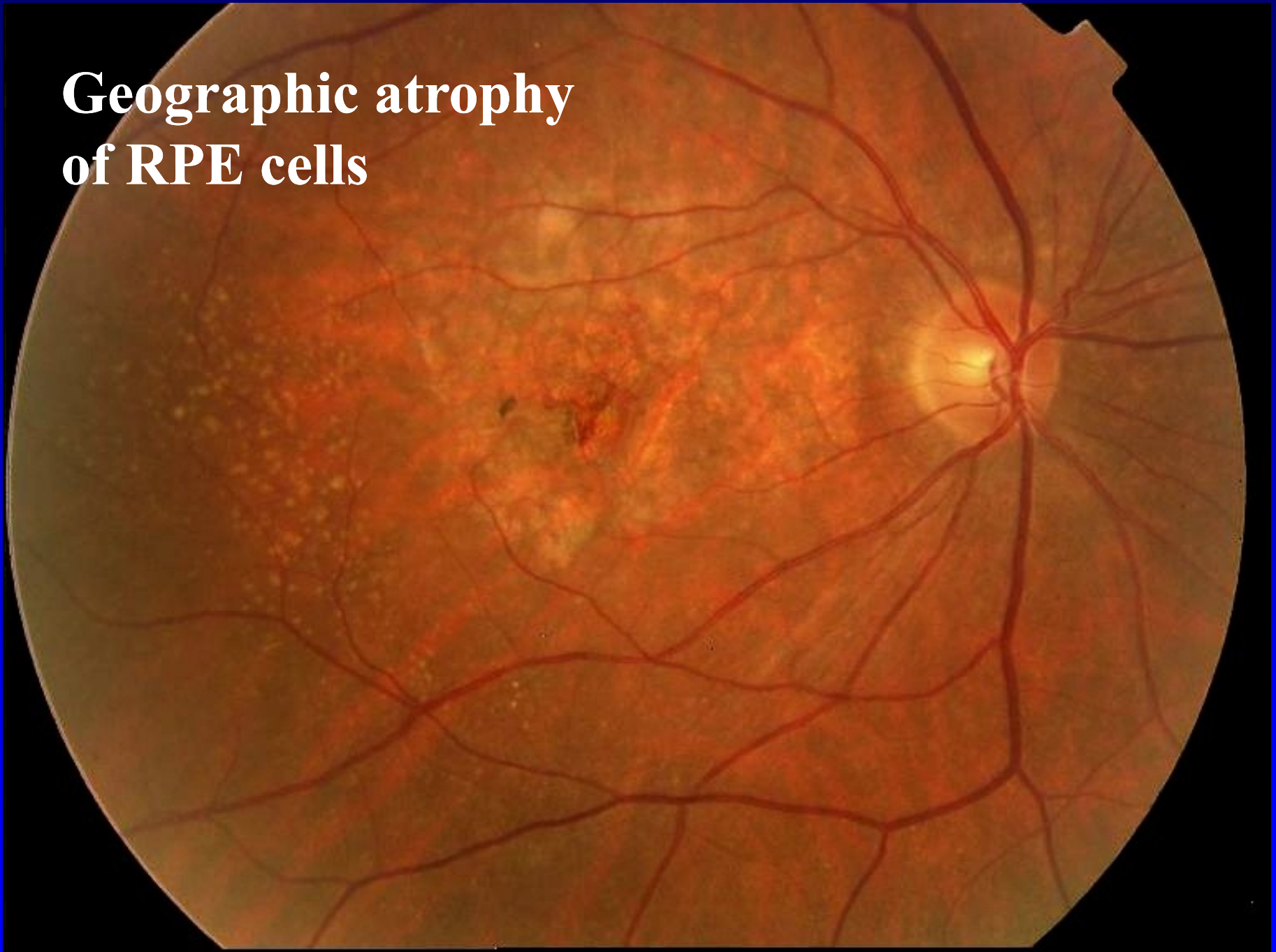
**Druse
n**



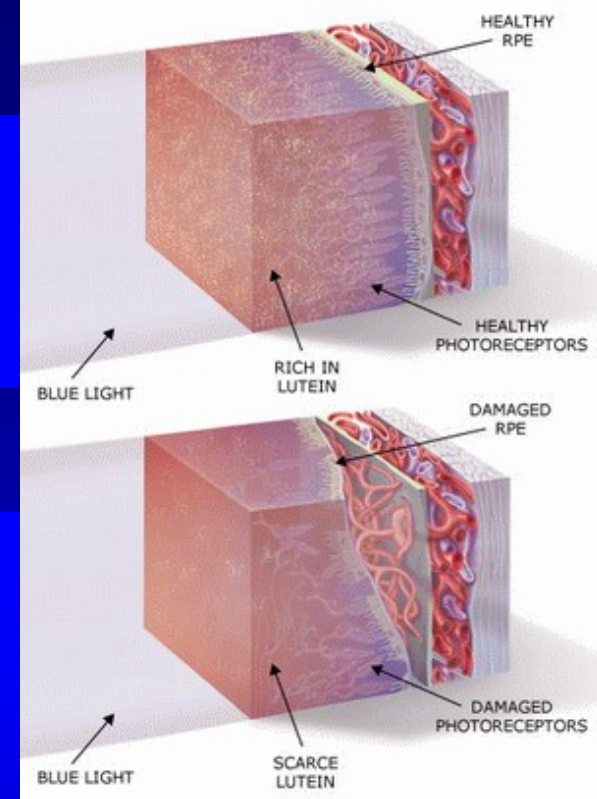
RPE changes



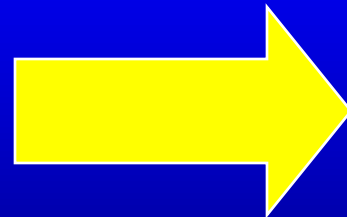
**Geographic atrophy
of RPE cells**



Classification of AMD



Wet form of
AMD



Choroidal
neovascularisation

Classification of AMD

➤ CNV



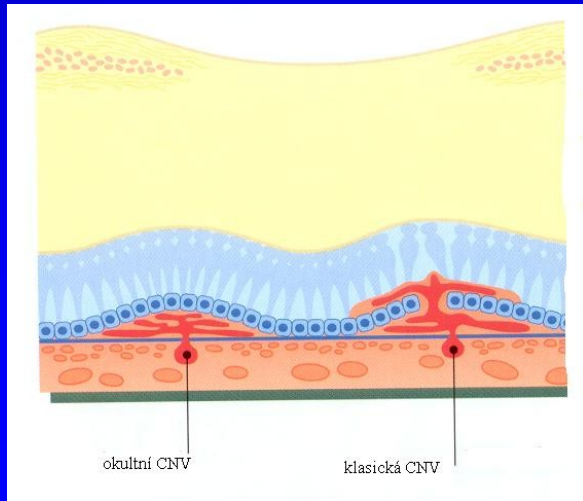
classical



occult



minimally classic

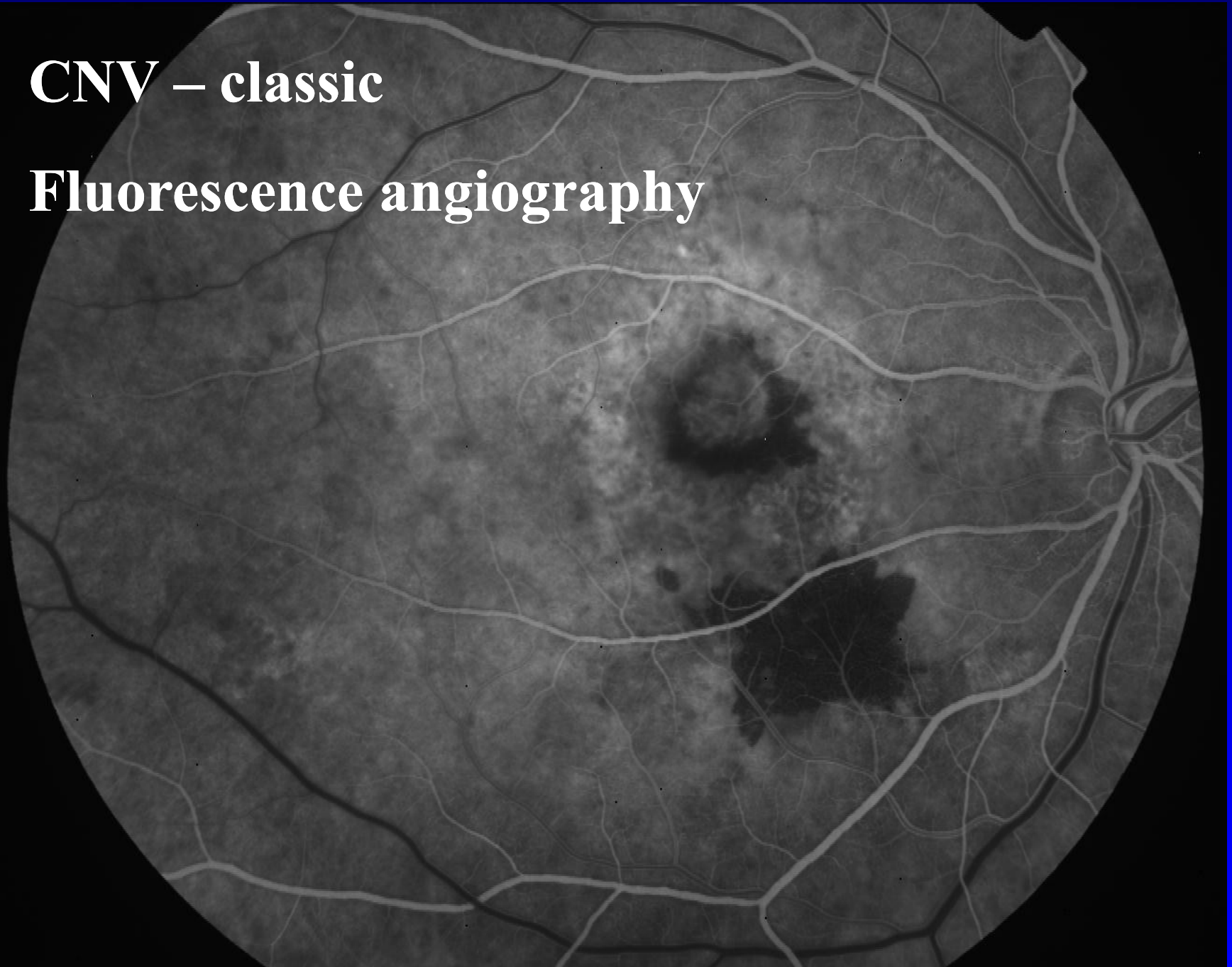


CNV - classic



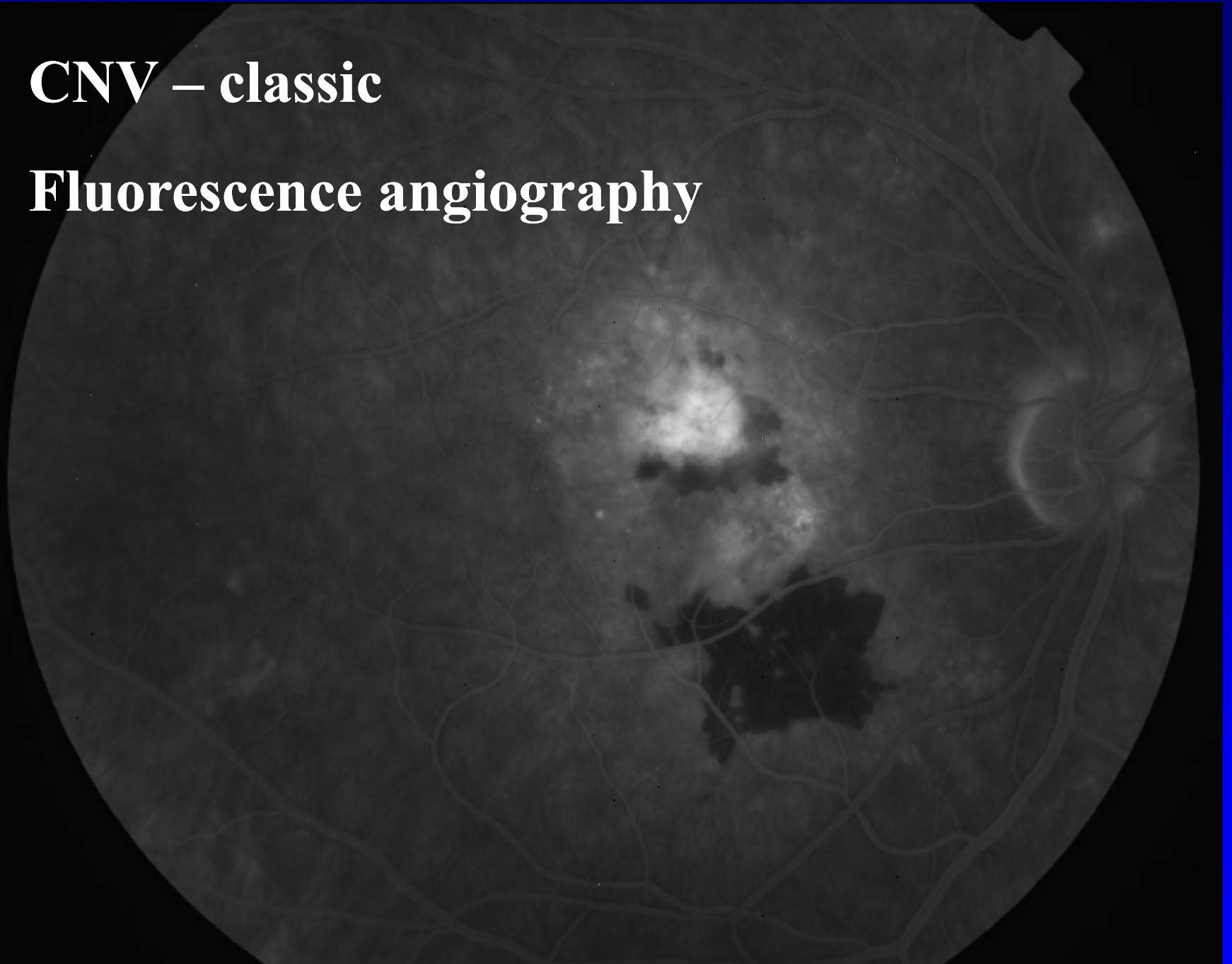
CNV – classic

Fluorescence angiography

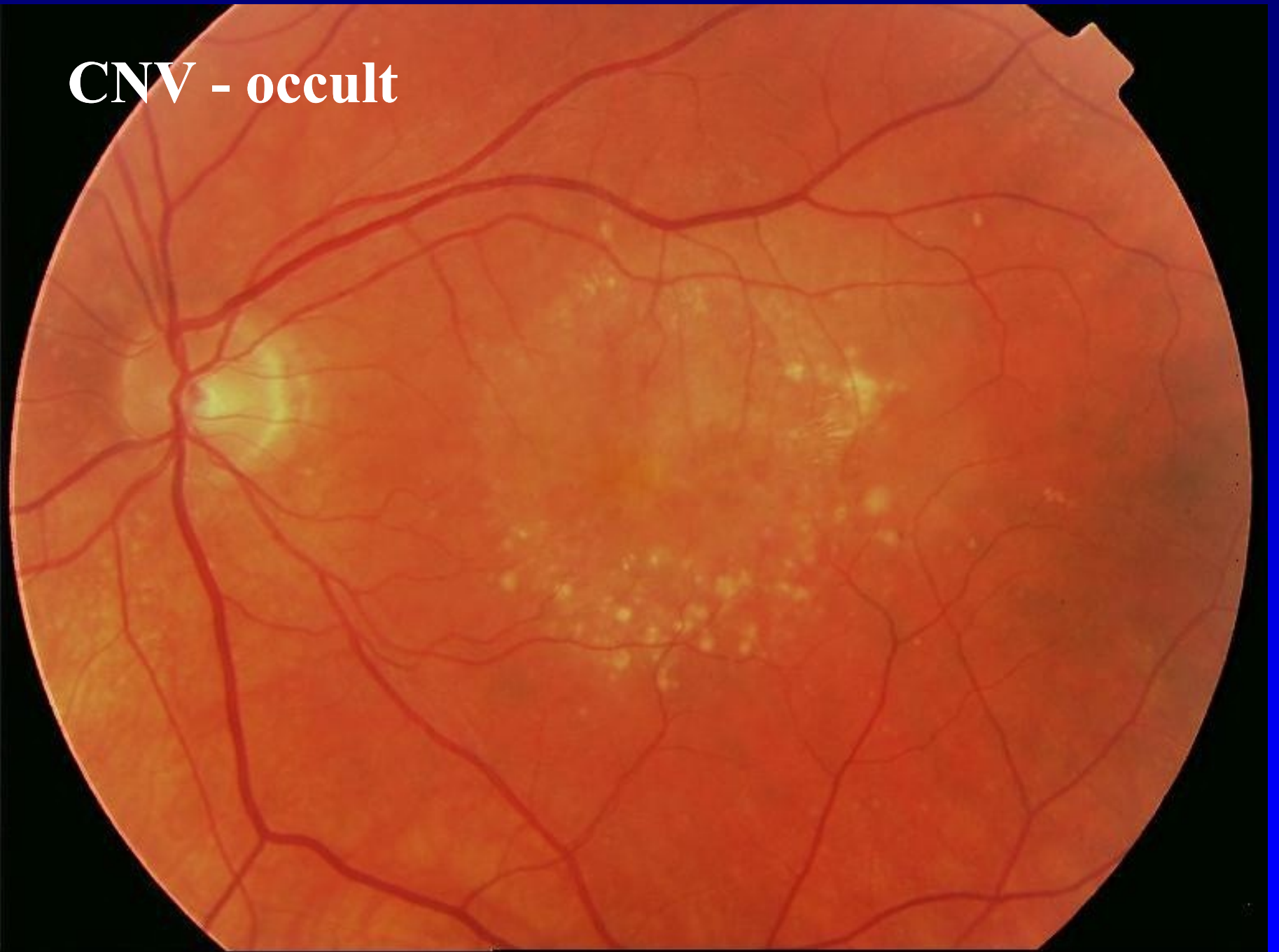


CNV – classic

Fluorescence angiography

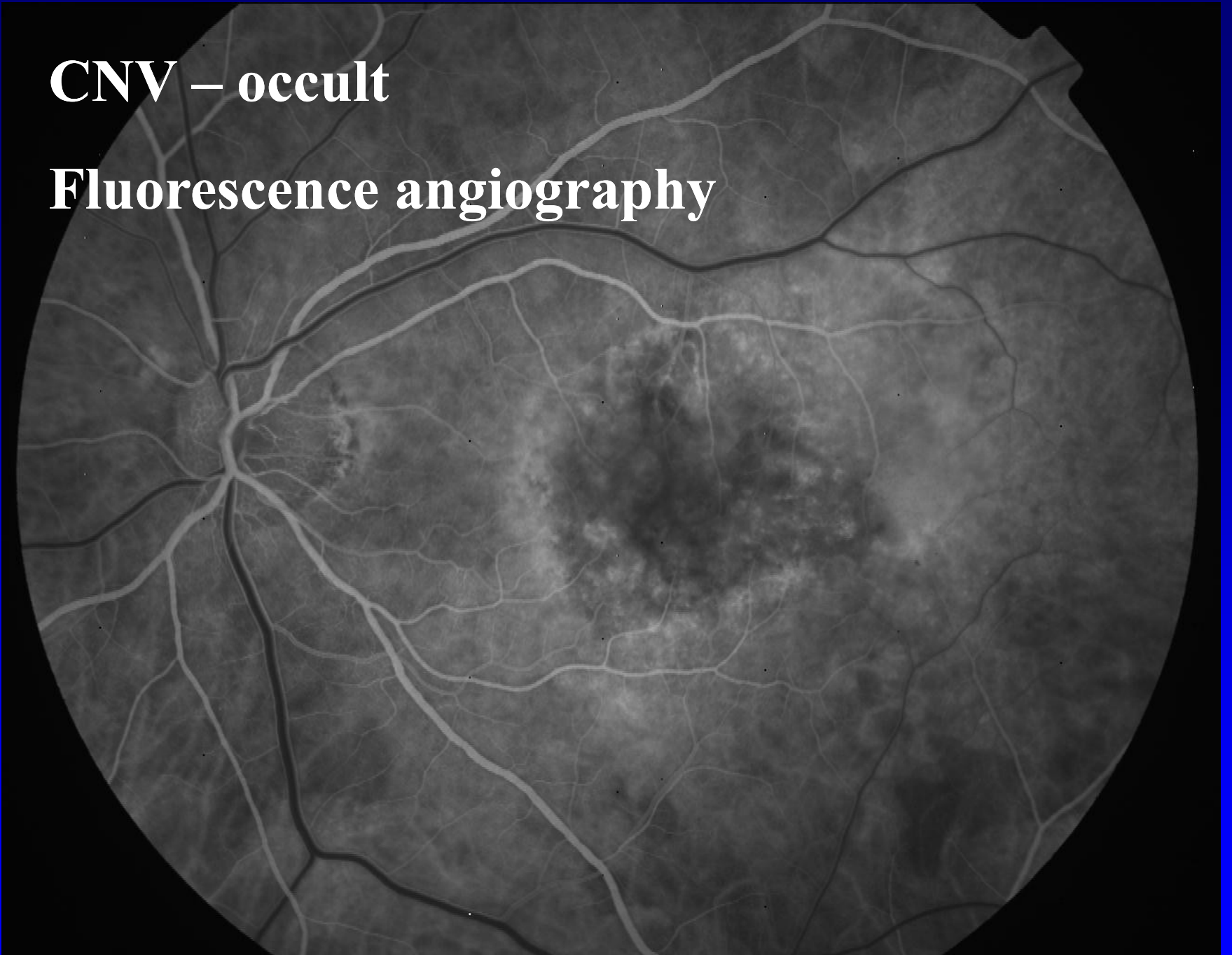


CNV - occult



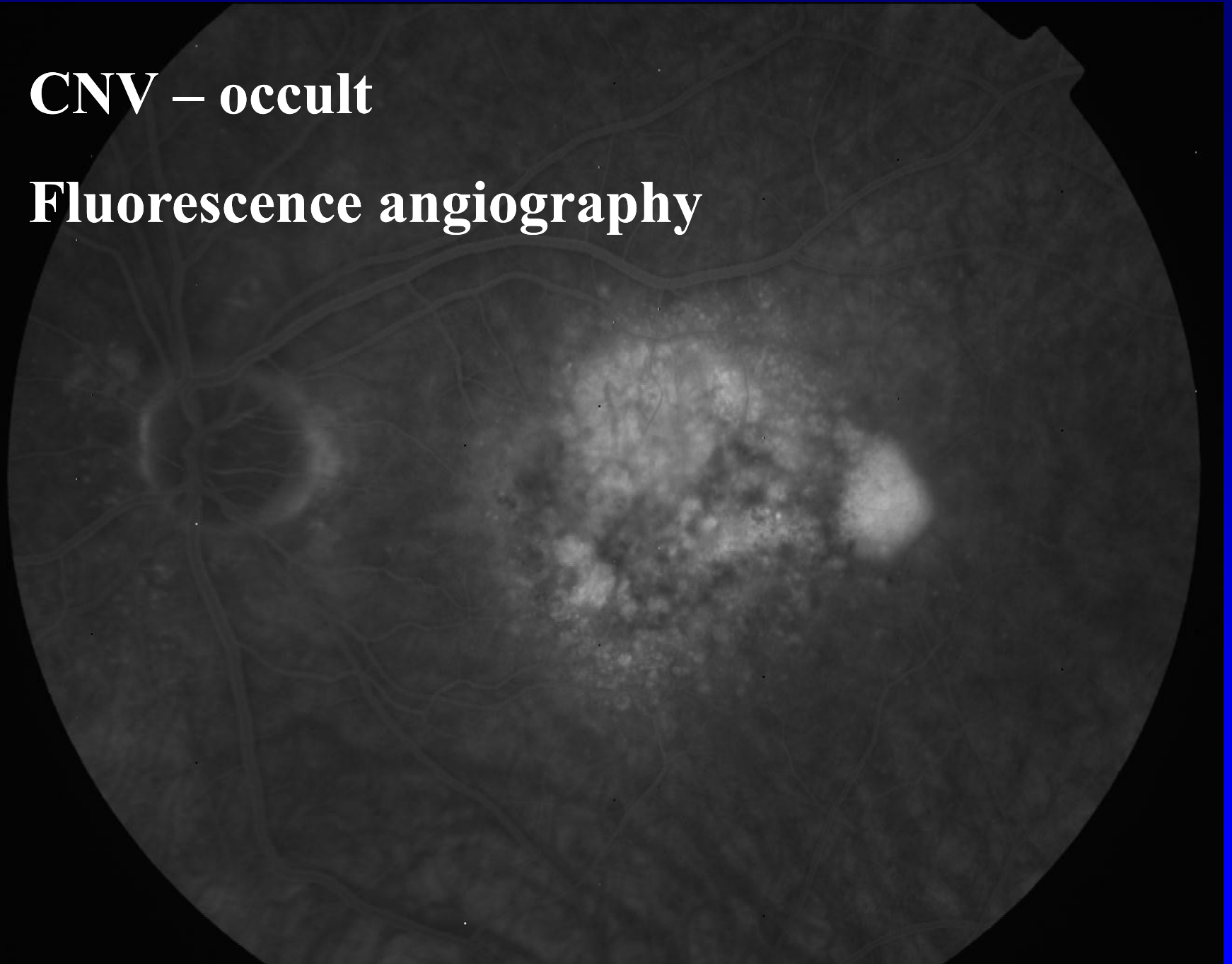
CNV – occult

Fluorescence angiography



CNV – occult

Fluorescence angiography

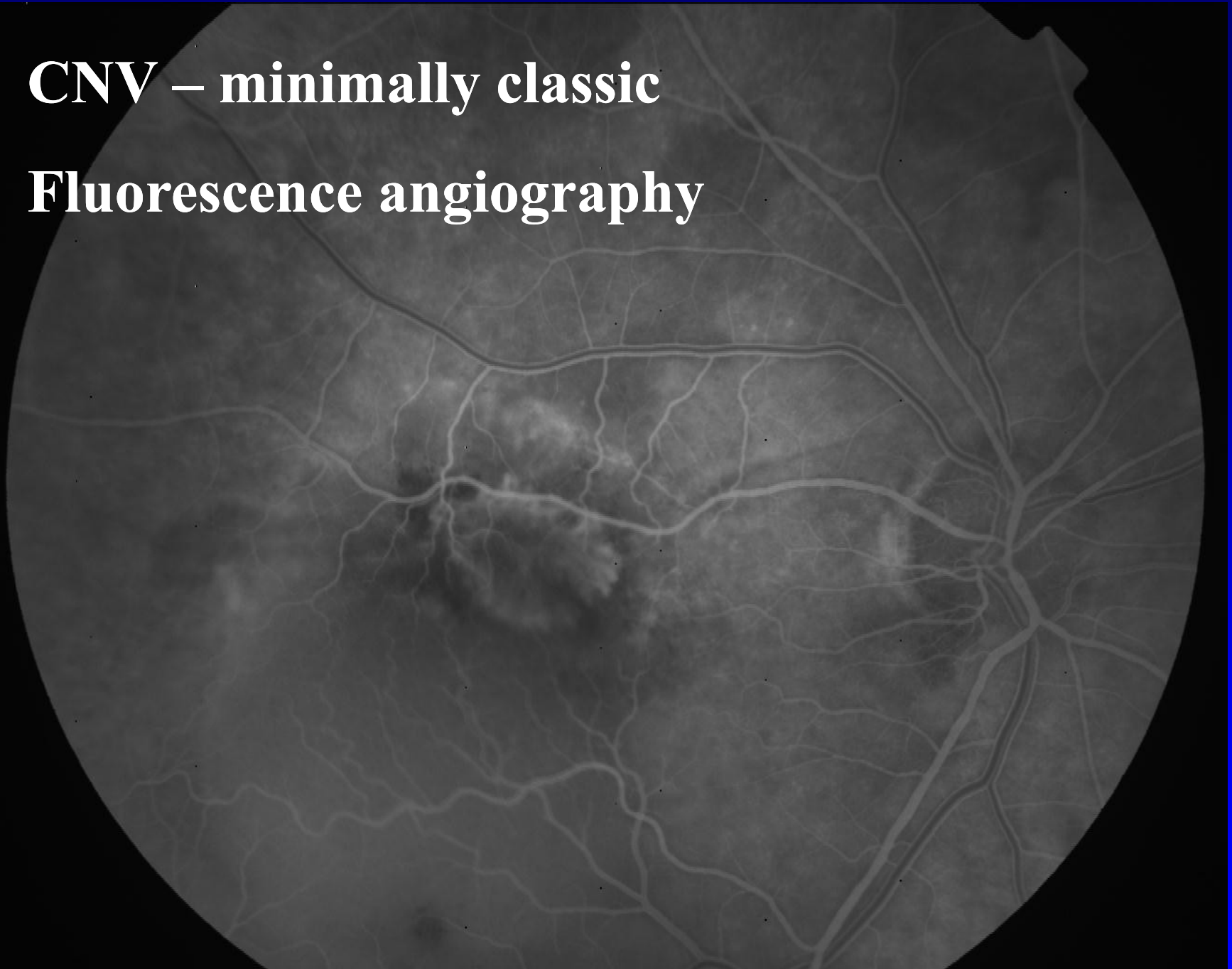


CNV – minimally classic



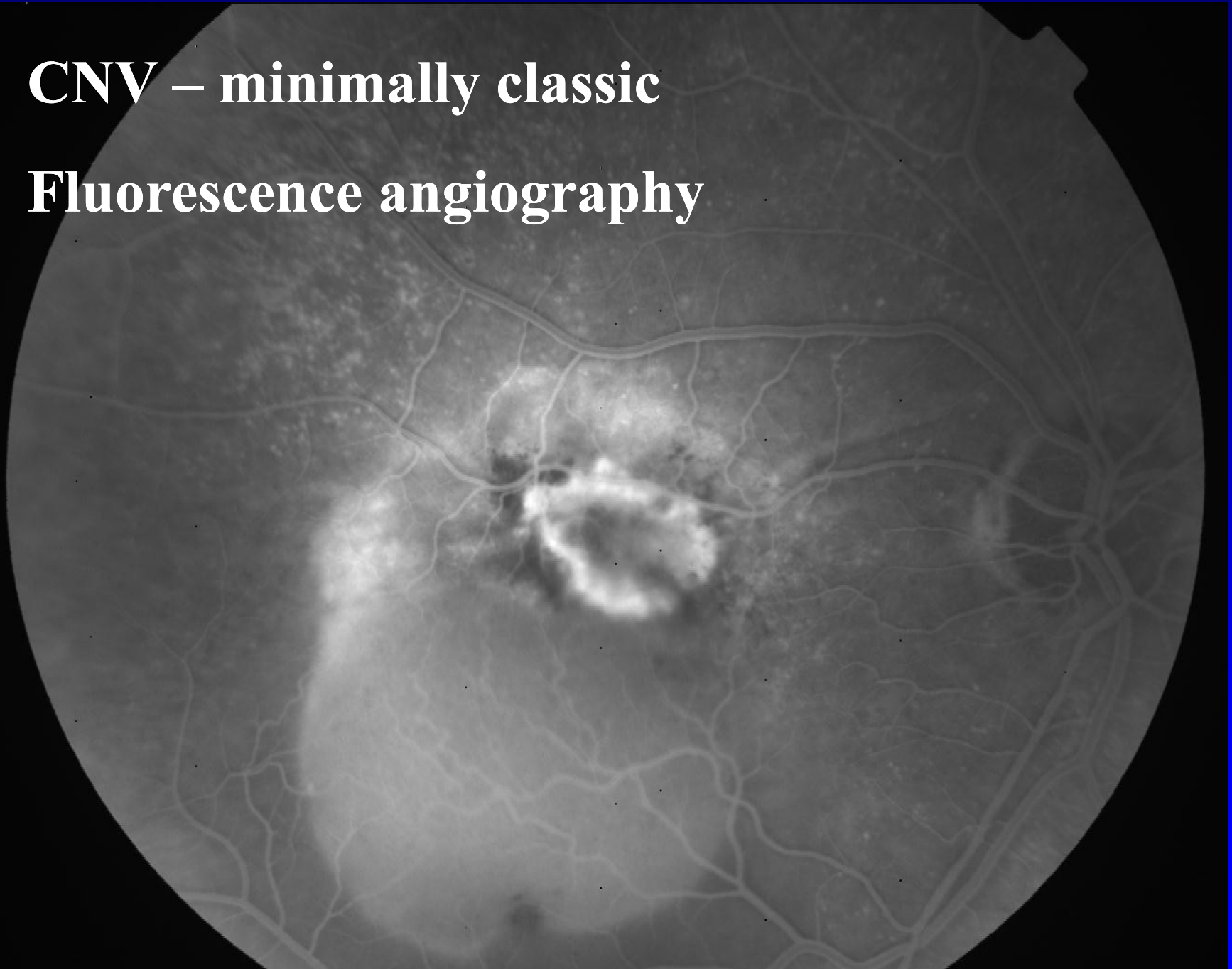
CNV – minimally classic

Fluorescence angiography

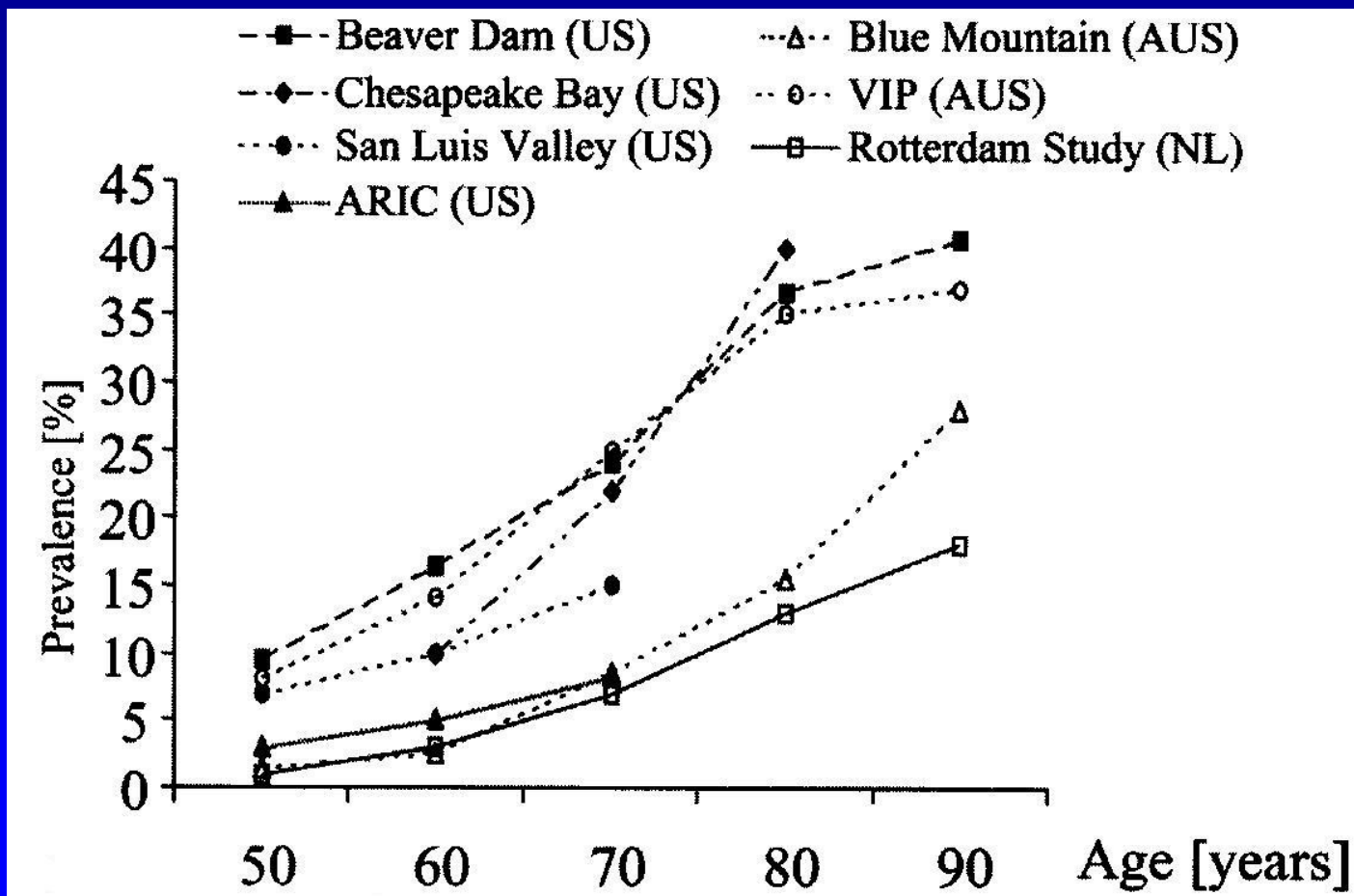


CNV – minimally classic

Fluorescence angiography



Prevalence of AMD



Risc factors of AMD

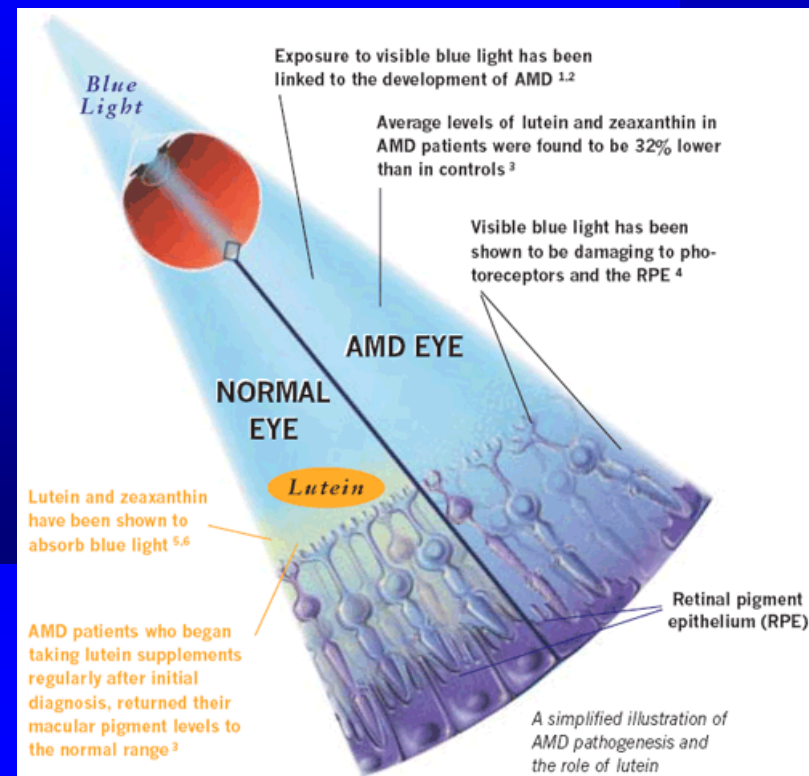
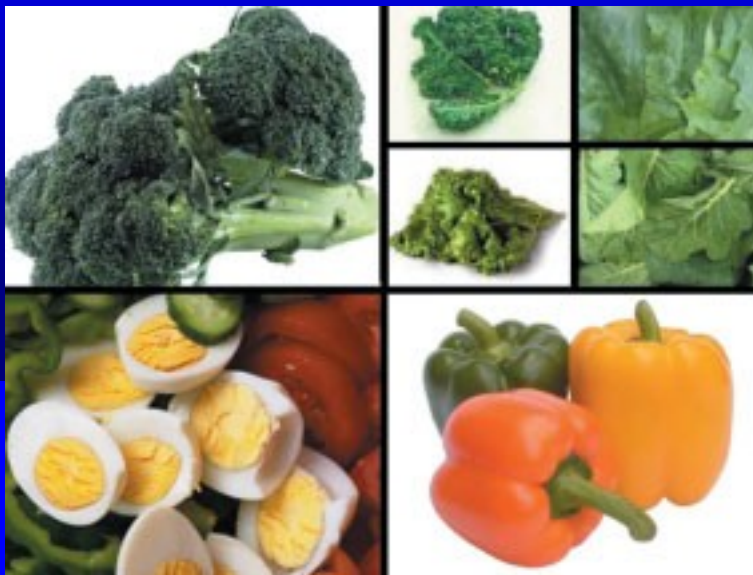
- Genetic factors
- Race influences
- Gender and hormonal influences
- Ophthalmic risc factors

Risc factors of AMD

- Vascular risc factors
- Environmental influences
- Antioxidants level
- Comorbidity

Antioxidants

➤ **Lutein and zeexantin** (the most important retinal carotenoids)

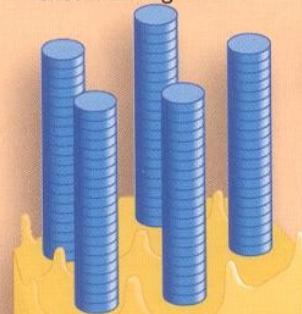


FREE RADICAL HYPOTHESIS OF THE AMD PATHOGENESIS

LIGHT



PHOTORECEPTORS
external segments



PHAGOCYTOSIS

PIGMENT
EPITHELIUM
CELLS

ANTI-
OXIDATIVE
CELL
PROTEC-
TION

LACK OF
ANTI-OXIDATIVE
CELL PROTECTION

FREE RADICALS

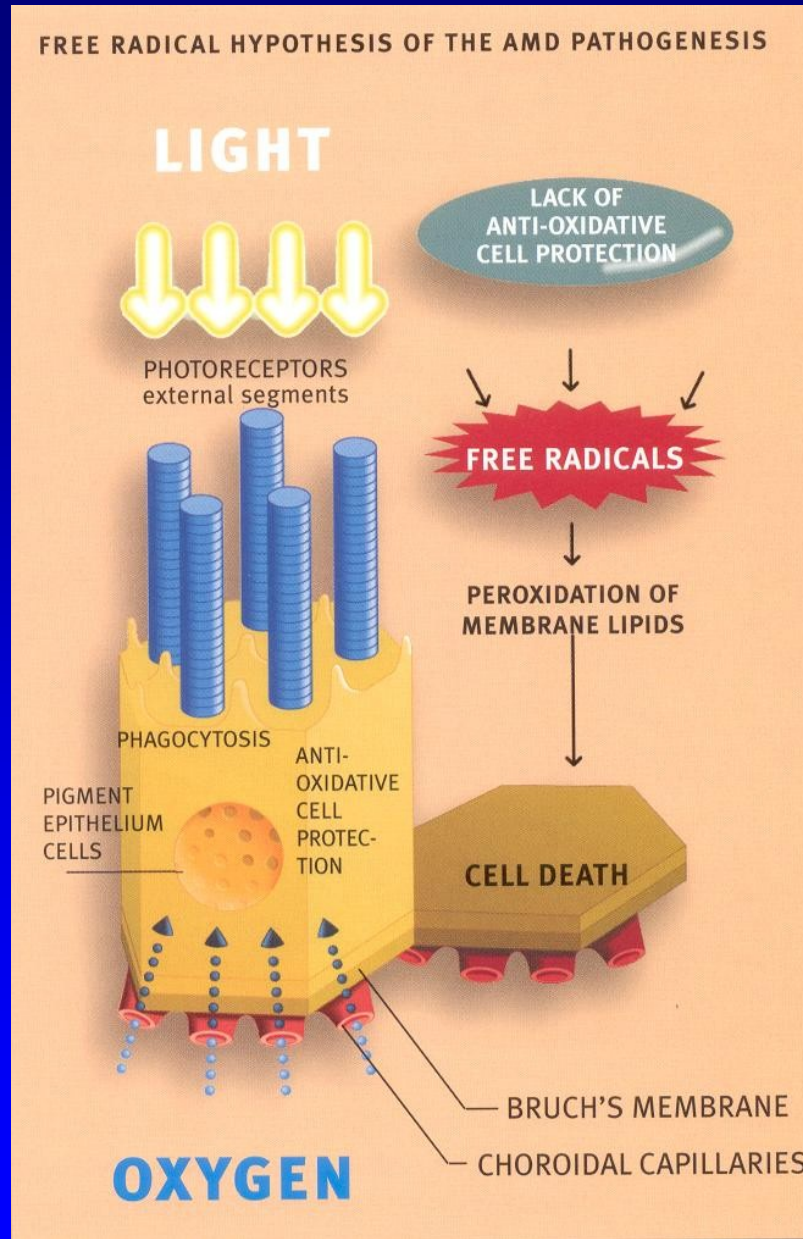
PEROXIDATION OF
MEMBRANE LIPIDS

CELL DEATH

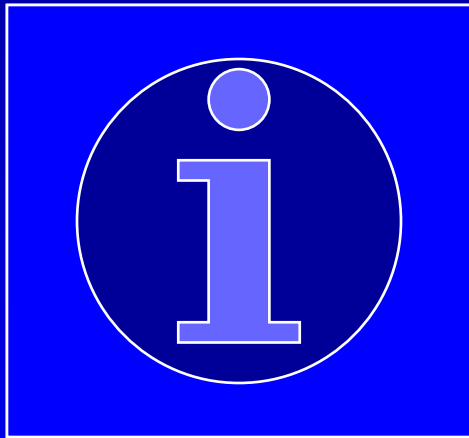
BRUCH'S MEMBRANE

CHOROIDAL CAPILLARIES

OXYGEN



Risc factors summary



věk



kouření



světlo



strava



žena



barva iris

Retinal physiology

Outer segments of photoreceptors



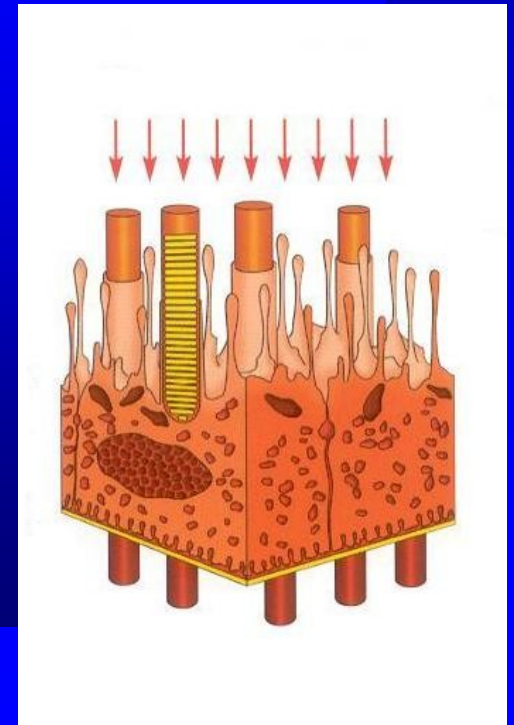
RPE



Bruch's membrane



Choriocapillaris



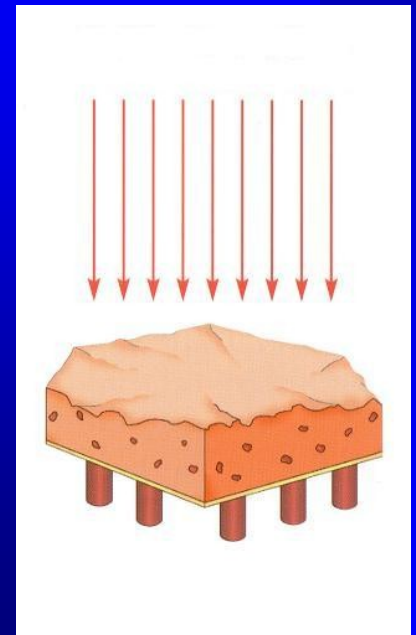
Etiopathogenesis of AMD

↓ RPE cells with age (apoptosis, necrosis)

↓ Melanosomes

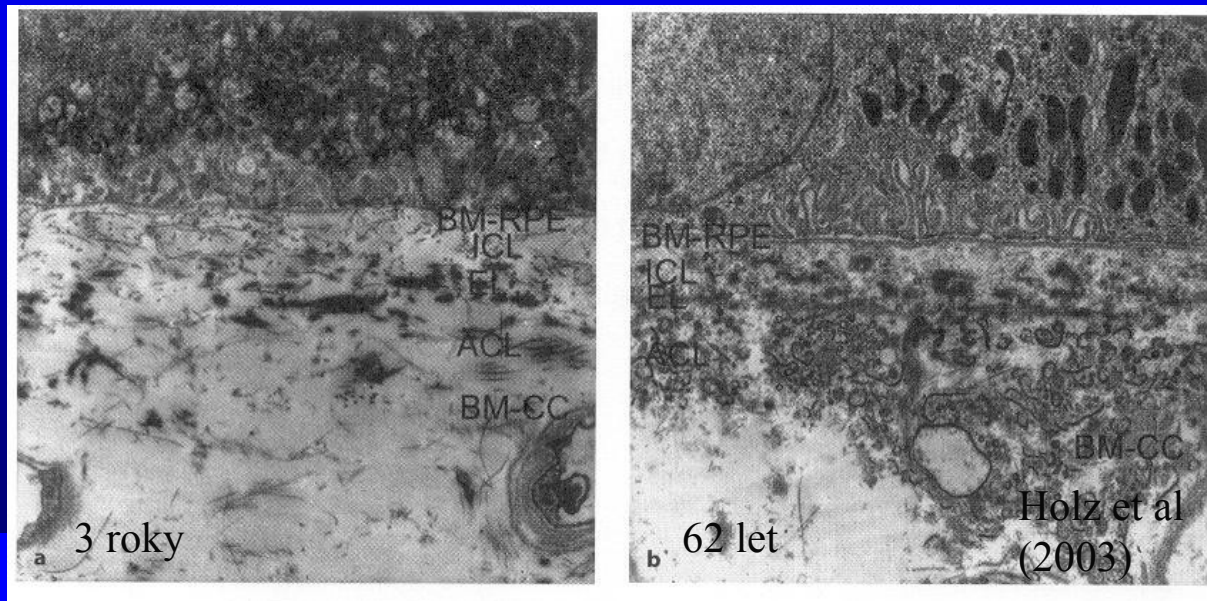
↑ Lipofuscin accumulation

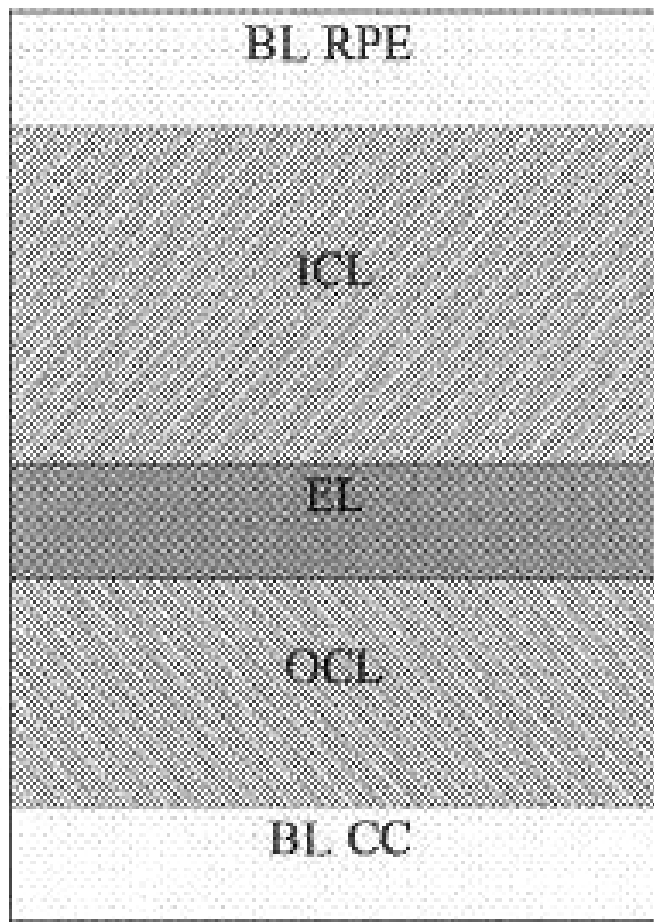
↓ apoptosis



Etiopathogenesis of AMD

- ↓ pliability of Bruch's membrane with aging
(thickening, granular and vesicular structures)





9 %

44 %

23 %

20 %

4 %

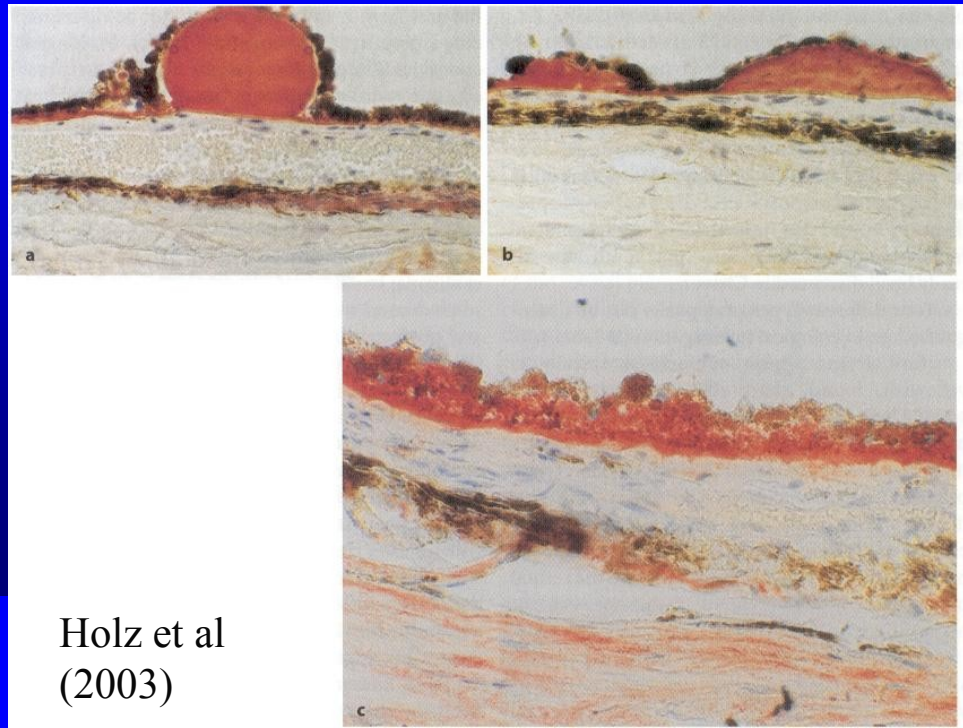
CIV, CV, Laminin, Vitronectin, HS
CI, CIII, CV; Fibronectin, CS, DS
Elastin, CVI, Fibronectin
CI, CIII, CV; Fibronectin, CS, DS
CIV, CV, CVI, Laminin, Vitronectin, HS

Marshall *et al* 1998 (modified)

Etiopathogenesis of AMD

➤ Drusen

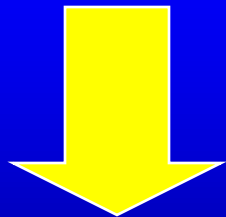
- soft (confluent)
- hard (solitary)



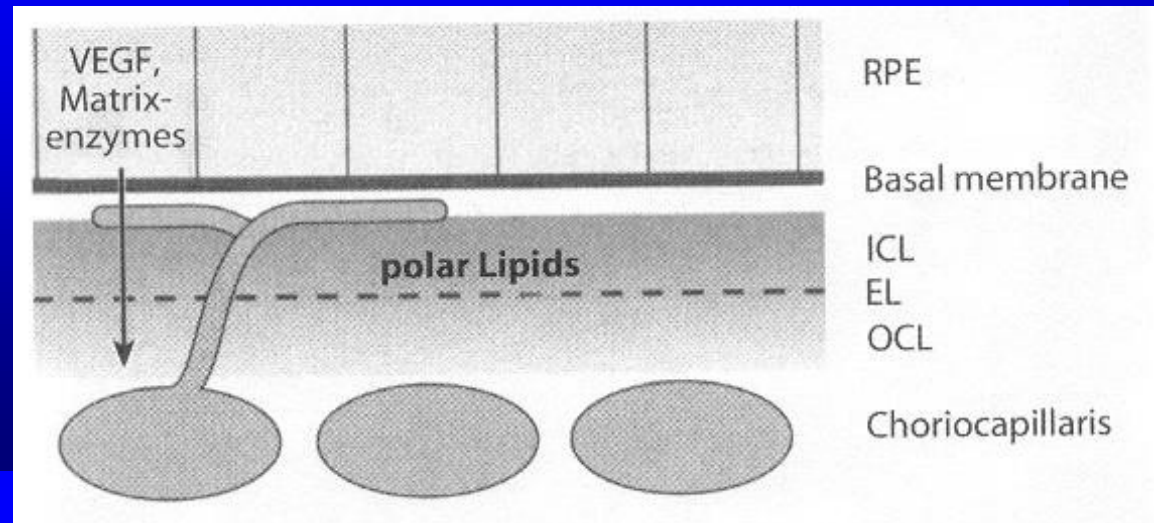
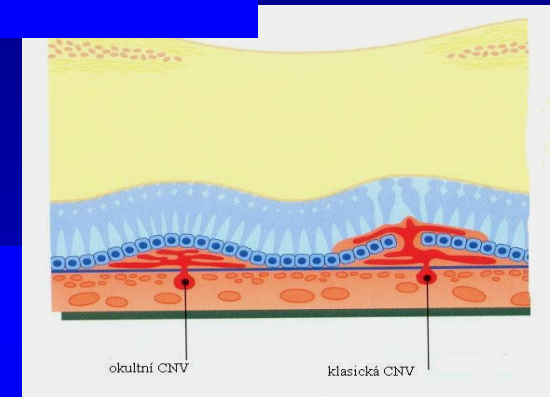
Holz et al
(2003)

Etiopathogenesis of AMD

➤ CNV (choroidal neovascularization)

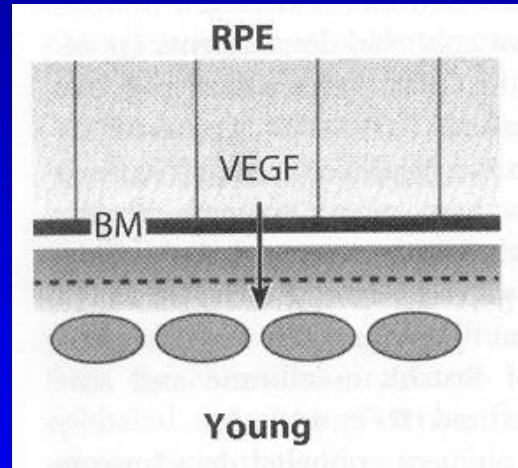


Vascular factors (VEGF)

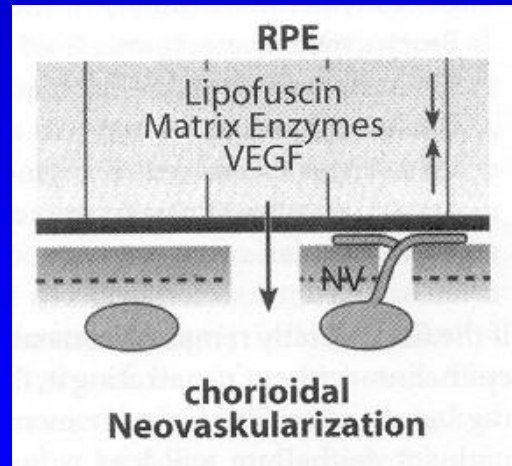


Etiopathogenesis of AMD

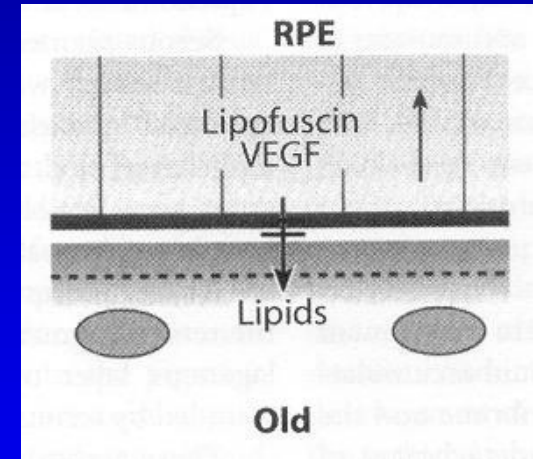
Physiological status



CNV



Aging



Holz et al (2003)

Therapy of AMD (summary)

- **Anti VEGF**
- **PDT (photodynamic therapy)**