Chronic Visual Loss

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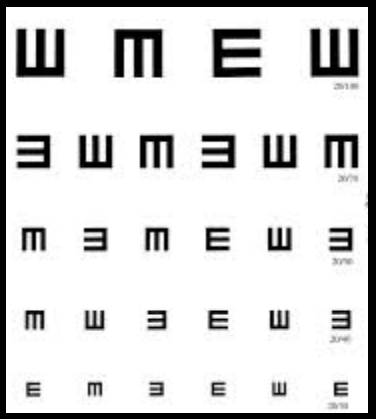
Chronic Visual Loss



Vision:

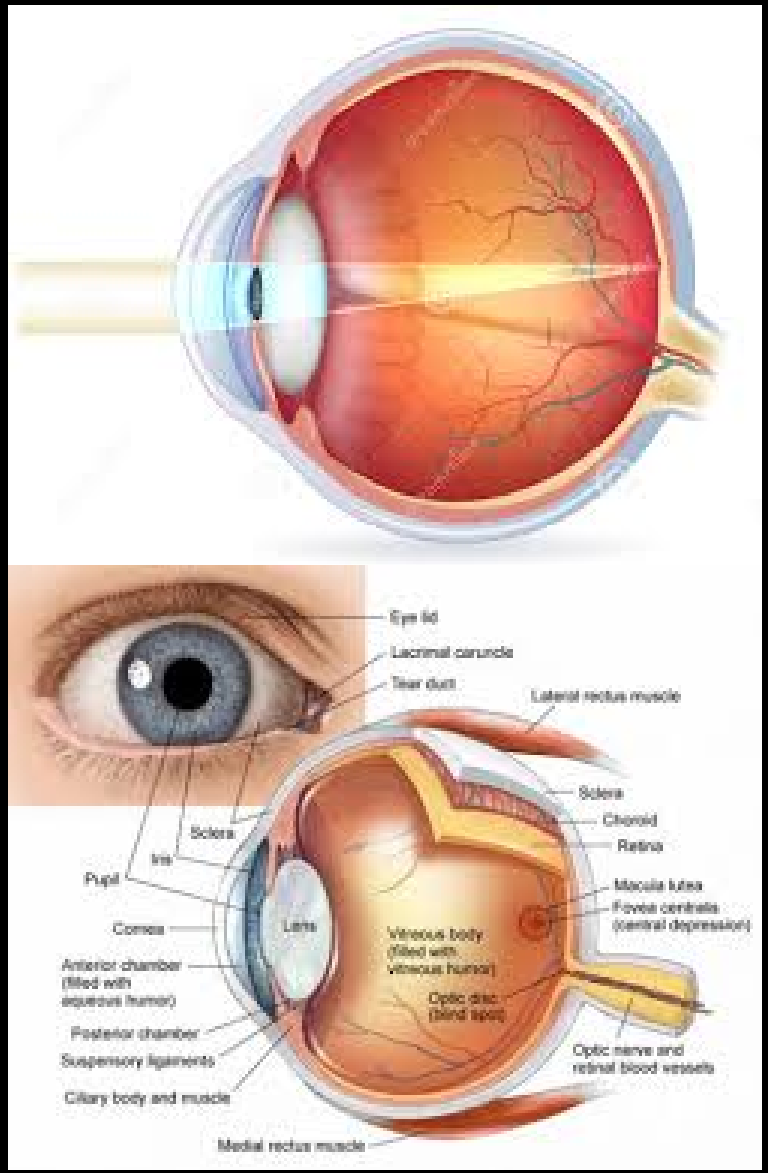
1- Quantity: VA

2- Quality: VF, clarity of vision, color vision

Chronic Visual Loss

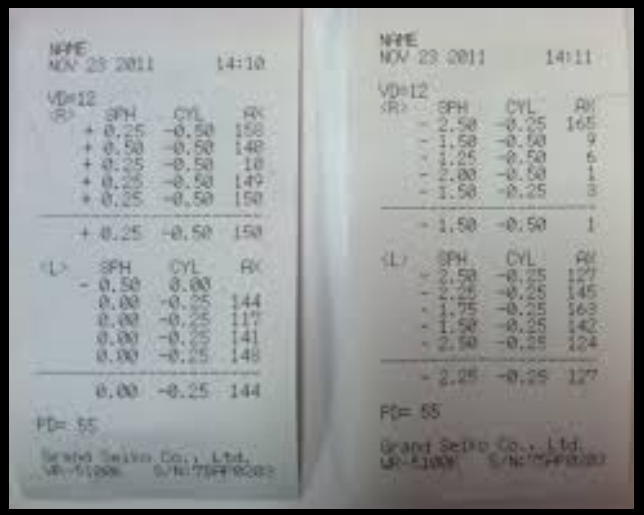
Causes:

1. Refractive
2. Cornea
3. Lens
4. Vitreous
5. Retina
6. Optic Nerve
7. Neurologic



Chronic Visual Loss

Refractive

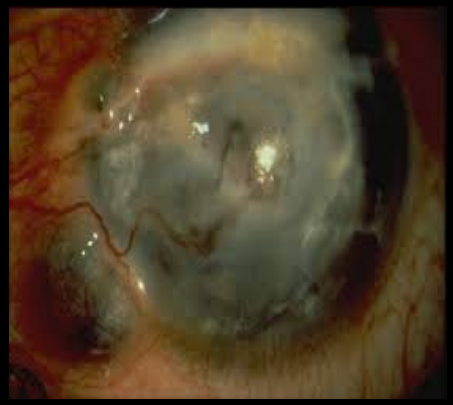


- Mostly in young patients
- Myopia, hyperopia or astigmatism
- Amblyopia !!
- Signs: Normal exam. Refraction needed to show errors
- Rx: Glasses, CL, Refractive surgery
- NB: lenticular causes needs cataract surgery

Chronic Visual Loss

Cornea

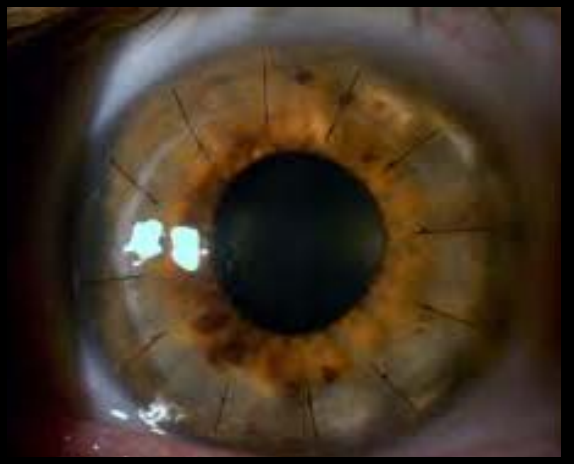
- Scar: trauma, infection
- Hereditary: corneal dystrophies, keratoconus
- Signs: corneal scar, bulging corneal, stromal opacities. Might have some conjunctival injection with chronicity


Chronic Visual Loss

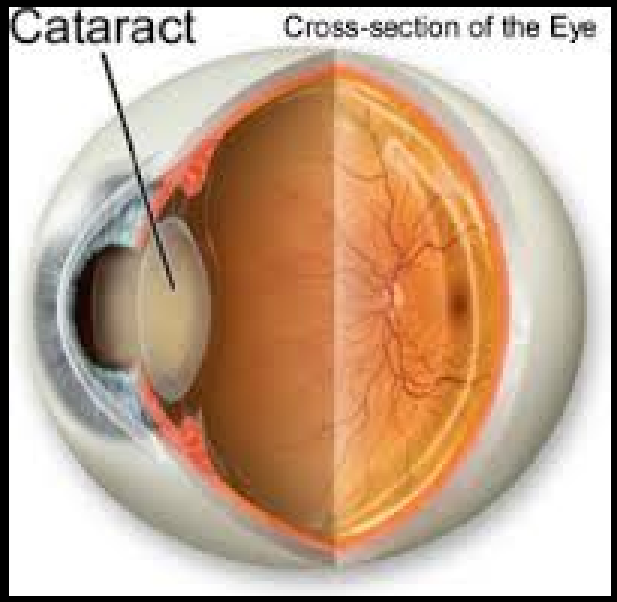
Cornea

- Rx: Refraction, CL (soft or hard), corneal cross linking, keratoplasty



Chronic Visual Loss

Lens



Disorganization of lens proteins

↓

Opacification

Chronic Visual Loss

Lens

- Causes:

A. Age related
B. Metabolic
C. Traumatic
D. Congenital
E. Drugs
F. Inflammation
G. Ocular

Chronic Visual Loss

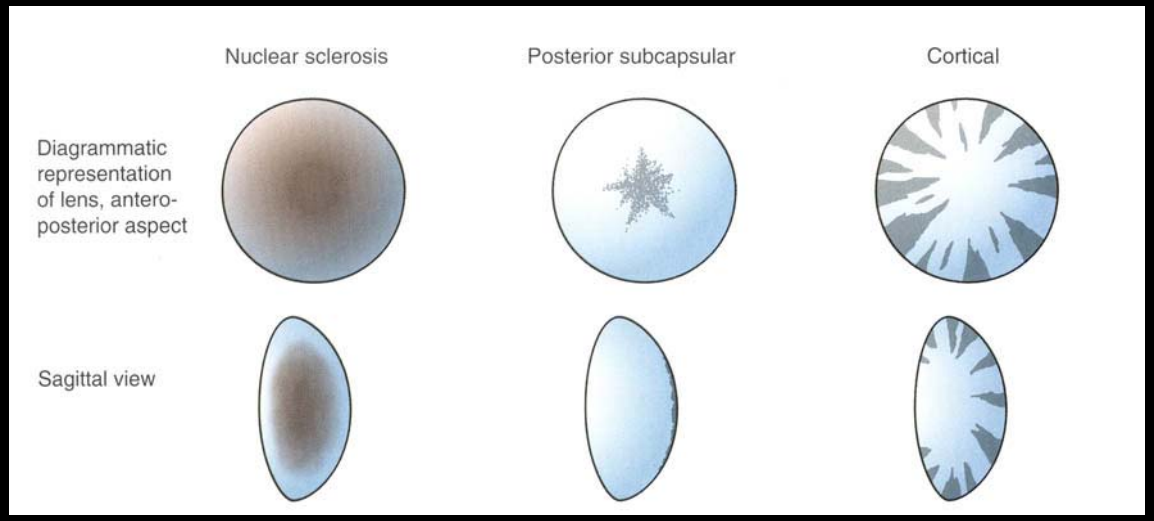
Lens

- Clinical Classification:

A. Maturity: immature, mature, hypermature

B. Anatomic: nuclear, subcapsular, cortical

C. Age: congenital, infantile, pre-senile, senile



Chronic Visual Loss

Lens

- Gradual onset
- VA: worsening of existing myopia, correction of hyperopia
- Loss of contrast sensitivity in low light
- Glare in bright light (scatter of light)

Chronic Visual Loss

Lens

- Management:

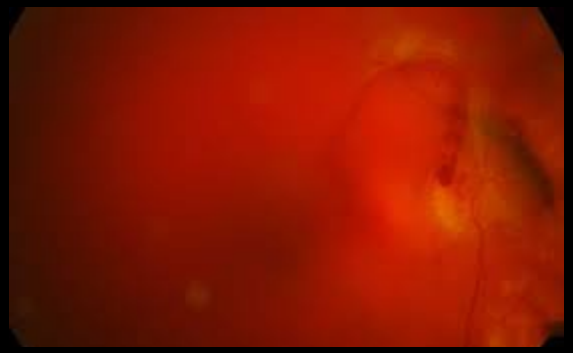
✓ Congenital: lens aspitation ± IOL

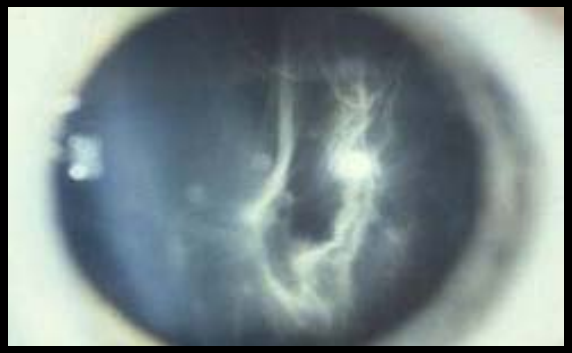
✓ Acquired: ECCE + PCIOL / Phaco + PCIOL

Chronic Visual Loss

Vitreous

- Vitreous Hge: trauma, PDR, uveitis, PR
- Vitreous condensation, opacification
- Vitritis: uveitis





Chronic Visual Loss

Vitreous

- Rx: underlying cause

Chronic Visual Loss

Glaucoma

- Second leading cause of blindness
- Early diagnosis is crucial to prevent loss of vision
- High IOP + Characteristic optic nerve head changes + visual field loss secondary to nerve fiber layer loss
- IOP is the single factor to be controlled

Chronic Visual Loss

Glaucoma

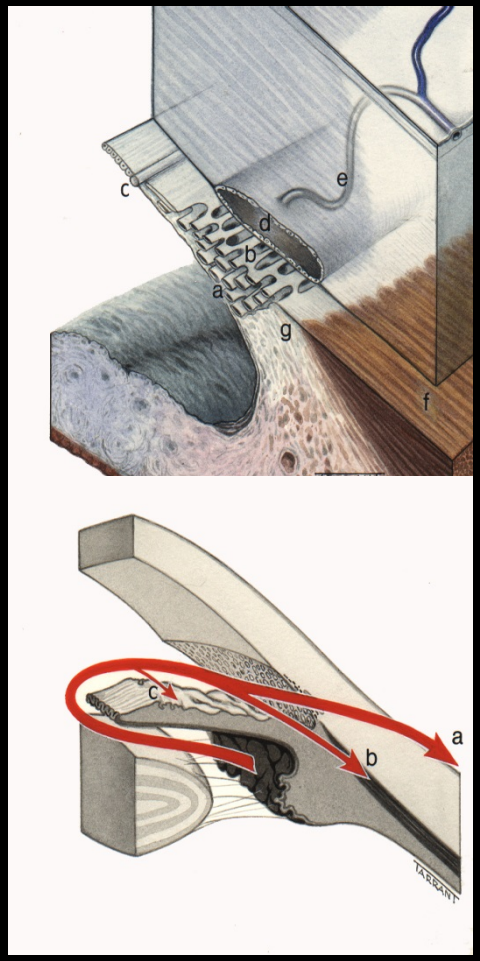
Aqueous Humor

- Active secretion:

1. Na/K ATPase
2. Cl secretion
3. Carbonic anhydrase

- Passive secretion

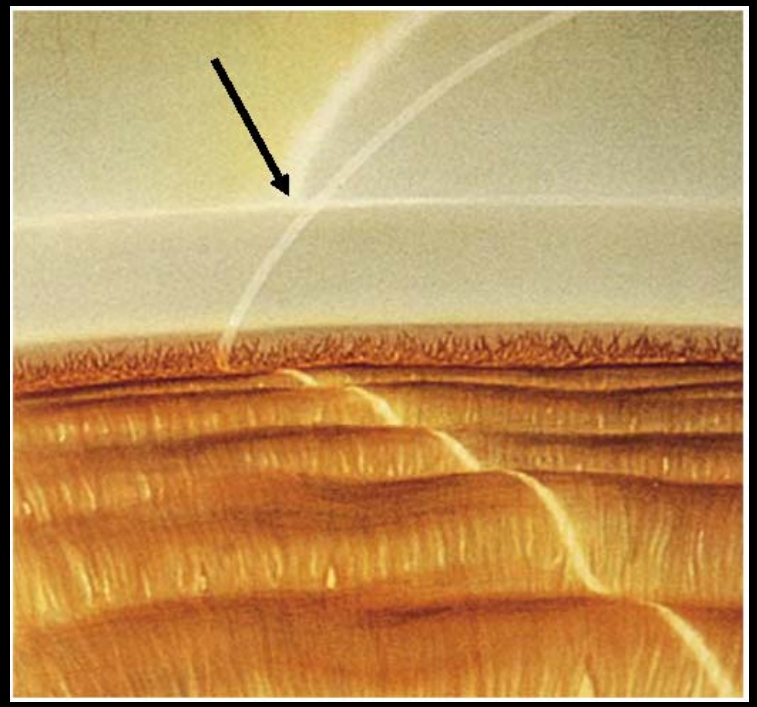
1. Ultrafiltration
2. Diffusion

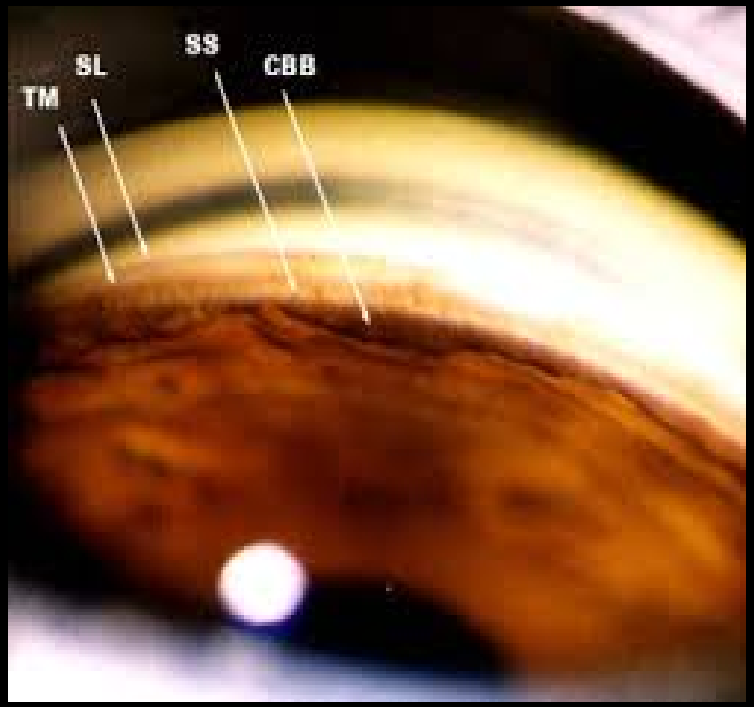


Chronic Visual Loss

Glaucoma

Gonioscopy



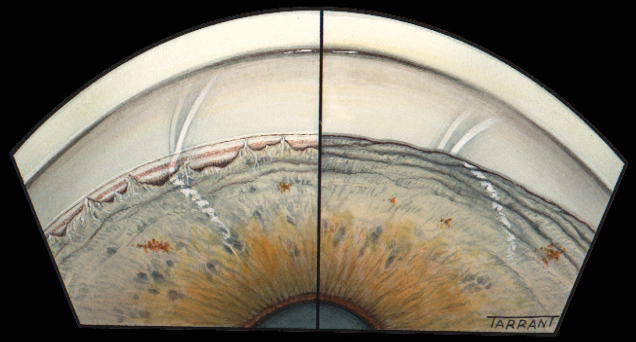


Chronic Visual Loss

Glaucoma

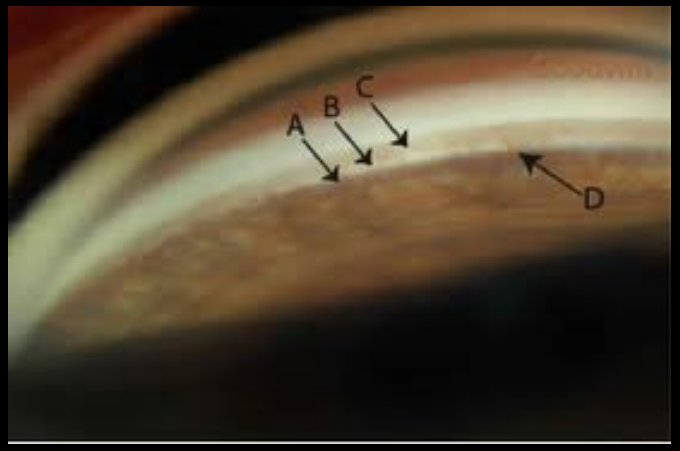
Is the iris

Covering TM



CLOSED

Not covering TM



OPEN

Chronic Visual Loss

Glaucoma

ONH complex evaluation

- Disc margin and disc diameter
- Neuroretinal rim
- Cup/disc ratio
- Disc size
- PPA
- NFL defect
- Optic disc haemorrhage

Chronic Visual Loss

Glaucoma Aetiology

Primary

- No detectable reason
- Often bilateral

Secondary

- Predisposing factor
- Often unilateral

Angle

Open

Closed

Combined Mechanism

Chronic Visual Loss

Glaucoma

- Start with peripheral (navigational) vision involvement

Chronic Visual Loss

Glaucoma

- Initially asymptomatic
- Usually detected on routine examination
- Risk factors:

➢ IOP

➢ age

➢ Family history

➢ DM

➢ myopia

Chronic Visual Loss

Glaucoma

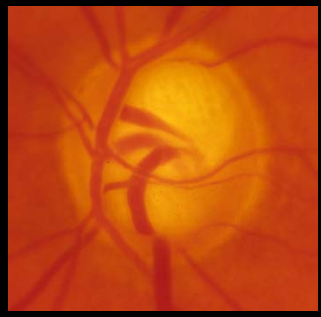
- Signs:

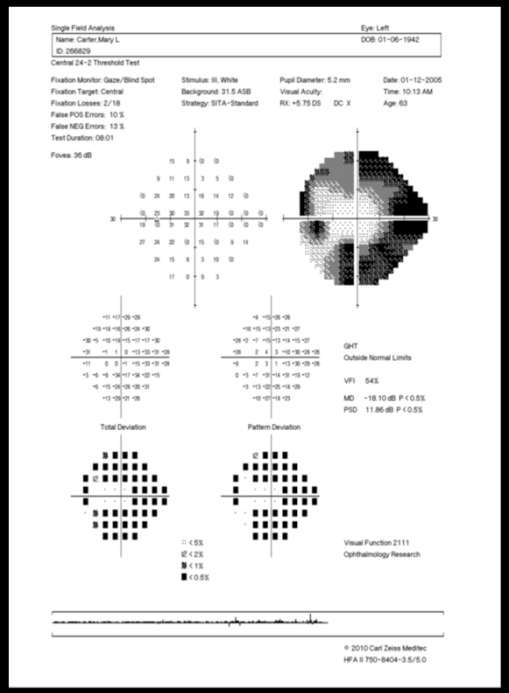
✓High IOP

✓Gonioscopy: open or closed

✓Optic nerve head damage

✓Visual field loss





Chronic Visual Loss

Glaucoma

- Rx:

✓ Antiglaucoma medications

✓ Lasers: SLT, PI

✓ Glaucoma surgery

Chronic Visual Loss

Macular Degeneration

- Impaired central vision
- Peripheral vision preserved
- Leading cause of legal blindness in developed world
- Multifactorial
  - Age
  - Smoking, vascular disease, UV light, diet, FHx

Chronic Visual Loss

Macular Degeneration

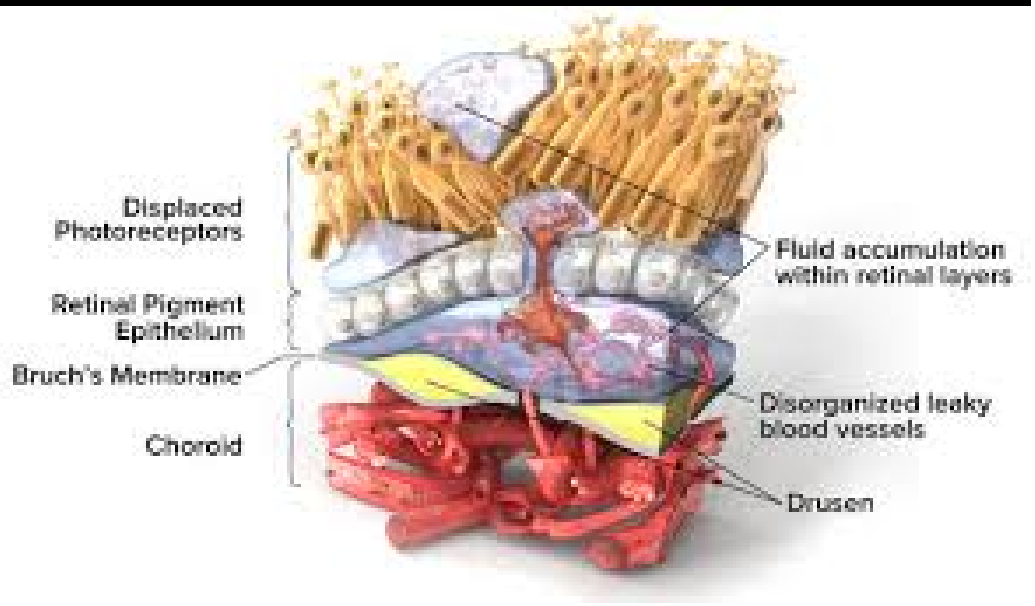
Complaints:

- Metamorphopsia: distorted vision
- Micropsia: reduction of size of objects
- Macropsia: enlargement of size of objects
- Scotoma: VF loss

Chronic Visual Loss

Macular Degeneration

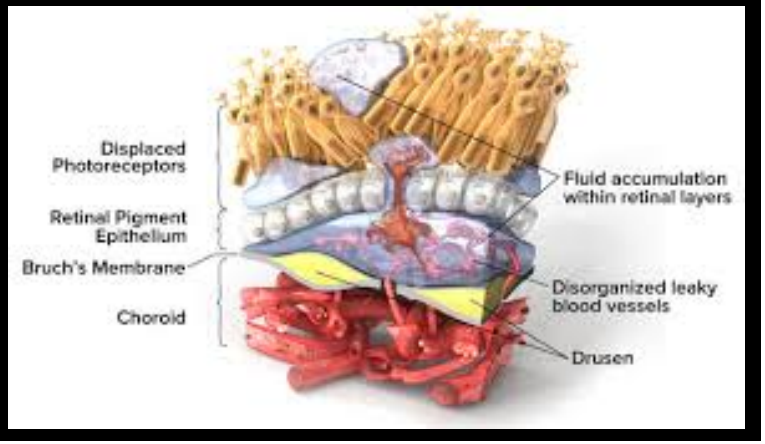
- Macular involvement:
  - Outer retinal layer
  - Retinal pigment epithelium
  - Bruch's membrane
  - choriocapillaris



Chronic Visual Loss

Macular Degeneration

- Drusens: lipid products from photoreceptor outer segments, found under retina
- new vessels from choroid grow into the sub-retinal space forming subretinal neovascular membrane
- Hemorrhage into subretinal space or even through the retina into the vitreous (significant loss of vision)



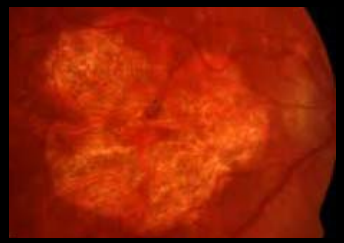
Chronic Visual Loss

Macular Degeneration

Atrophic

- Often asymptomatic
- Gradual over years
- Signs:
  - ➢ Drusen

  - ➢ Geographic atrophy



- Photoreceptor degeneration
- scotoma when light adapting

Exudative

- Rapidly progressive (weeks)
- Signs:
  - ➢ Choroidal (sub-retinal) neovascularisation

  - ➢ Pre-retinal hemorrhage
  - ➢ Elevation of retina
  - ➢ Subretinal fibrosis

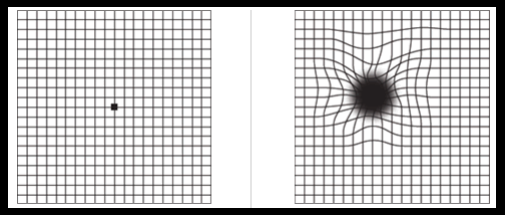
- Metamorphopsia

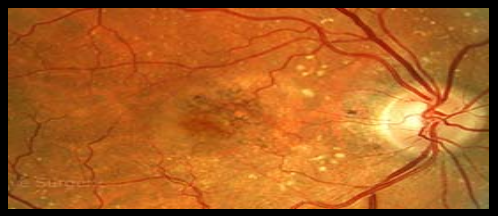
- Central scotoma

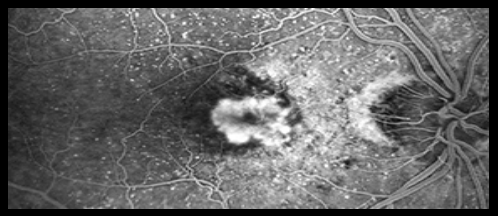
Chronic Visual Loss

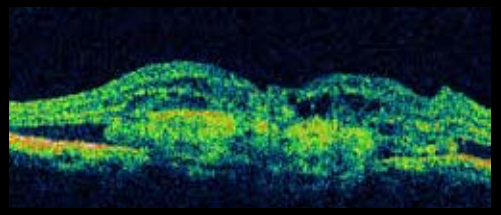
Macular Degeneration

- Diagnosis:
  - ✓ Visual acuity
  - ✓ Amsler grid
  - ✓ Ophthalmoscopy
  - ✓ Fluorescein angiography
  - ✓ ICG
  - ✓ OCT







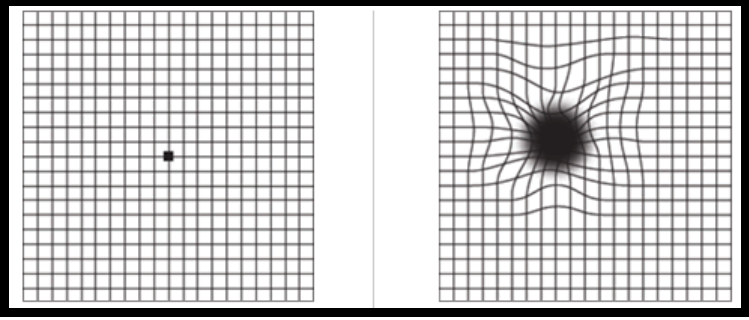


Chronic Visual Loss

Macular Degeneration

Rx Dry Macular Degeneration

- Lifestyle
- Stop smoking, reduce UV exposure, Zinc & antioxidants
- Low vision aids
- Monitoring with Amsler chart



Chronic Visual Loss

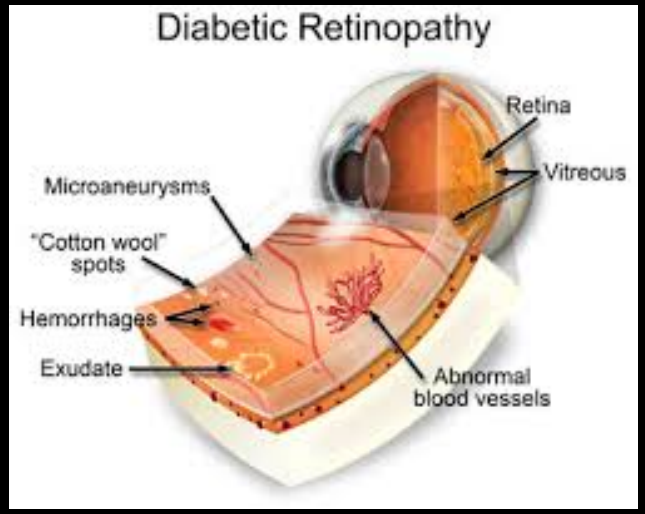
Macular Degeneration

- Observation
- Laser photocoagulation
- Anti-VEGF
- Verteporfin photodynamic therapy (PDT): injection of photosensitizer into systemic circulation followed immediately by laser targeting new vessels in macular area

Chronic Visual Loss

Diabetic Retinopathy

- Microangiopathy which involves pre-capillary arterioles, capillaries and post-capillary venules
- Microvascular occlusion
- Microvascular leakage



Chronic Visual Loss

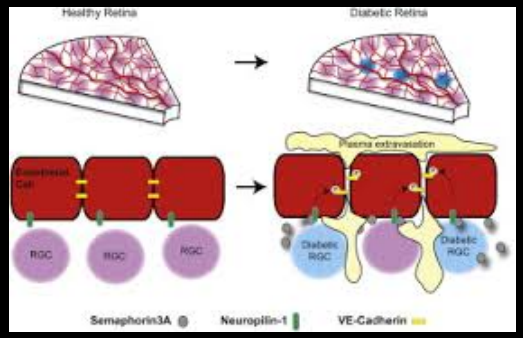
Diabetic Retinopathy

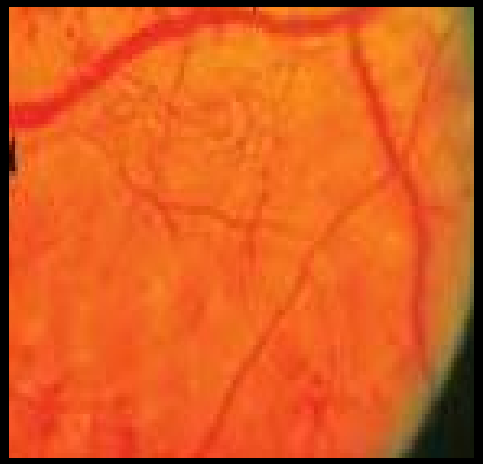
Microvascular Occlusion

Thick capillary basement membrane

Capillary endothelial cell damage

Changes in red blood cells





Retinal ischemia

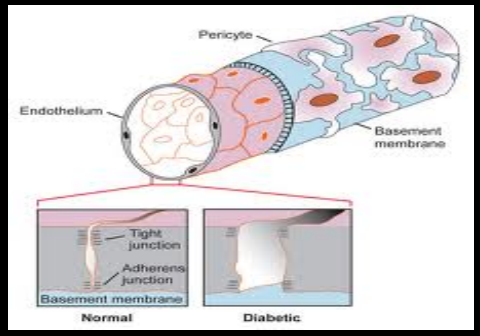
AV shunts and NVs

Chronic Visual Loss

Diabetic Retinopathy

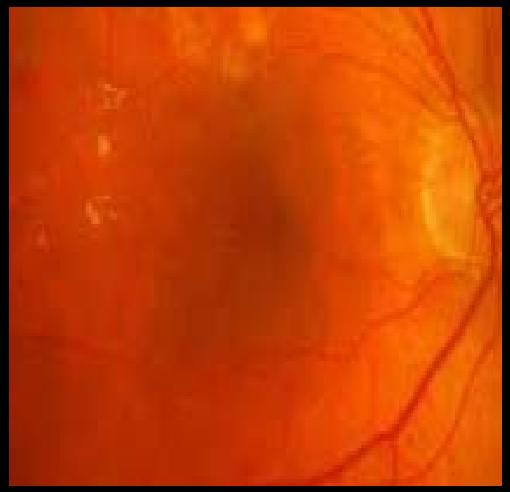
Microvascular Leakage

Loss of pericytes between endothelial cells



Leakage into retina

Exudates and edema



Chronic Visual Loss

Diabetic Retinopathy

Risk Factors

- Duration
- poor metabolic control
- Pregnancy
- HTN
- Nephropathy
- Smoking
- Obesity
- hyperlipidemia

Chronic Visual Loss

Diabetic Retinopathy

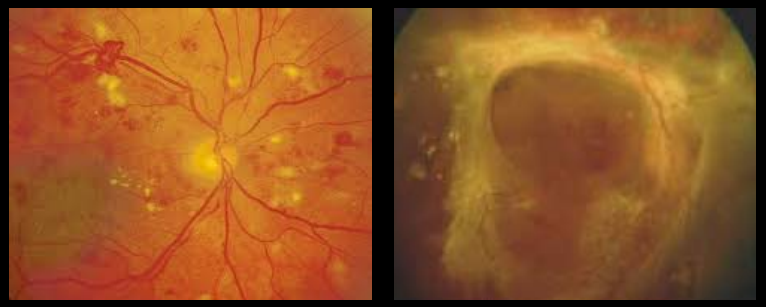
Classified clinically to two types:

- NPDR

A. Mild
B. Moderate
C. Sever

- PDR

A. Early
B. Advance



Chronic Visual Loss

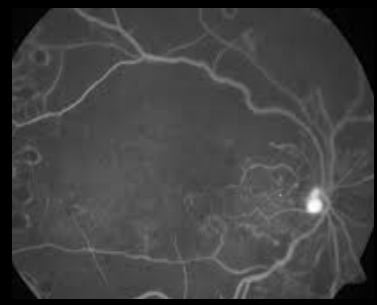
Diabetic Retinopathy

NPDR

- Asymptomatic
- Decreased visual acuity:

A. CSME

B. macular ischemia



Chronic Visual Loss

Diabetic Retinopathy

PDR

- Symptomatic
- Can also cause macular ischemia and/or edema

Chronic Visual Loss

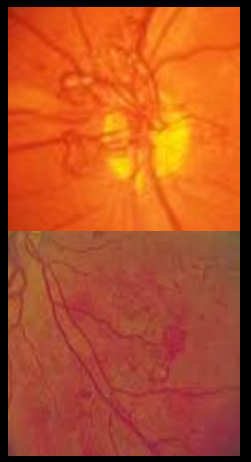
Diabetic Retinopathy

PDR

- Neovascularization

  NVD: neovascularization of the disc

  NVE: neovascularization elsewhere



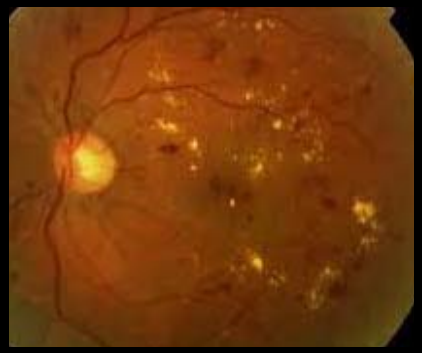
- Fragile (intra-retinal or vitreous hemorrhage)
- Associated with fibrous proliferation TRD

Chronic Visual Loss

Diabetic Retinopathy

Diabetic Macular Edema

- Retinal edema threatening or involving the macula
- Evaluate: location of retinal thickening relative to the fovea and the presence and location of exudates



Chronic Visual Loss

Diabetic Retinopathy

- Rx:
- Laser
- intravitreal steroid injection
- intravitreal anti-VEGF injection
- pars plana vitrectomy

Chronic Visual Loss

Retinitis Pigmentosa

- Group of genetic disorders affect the retina ability to respond to light
- Slow loss of vision: nyctalopia, loss of peripheral vision, blindness
- Most are legally bling by 40s
- Central visual field of less than 20 degrees
- XR: males: more often and more severe
  females: carry the genes and experience vision loss less frequently

Chronic Visual Loss

Retinitis Pigmentosa

- Target photoreceptors
- Associated with pigmentary changes in the RPE, which may be primary or secondary to the photoreceptor loss

Chronic Visual Loss

Retinitis Pigmentosa

Symptoms

- Nyctalopia (loss of night vision)
- Tunnel vision (loss of peripheral vision)

Chronic Visual Loss

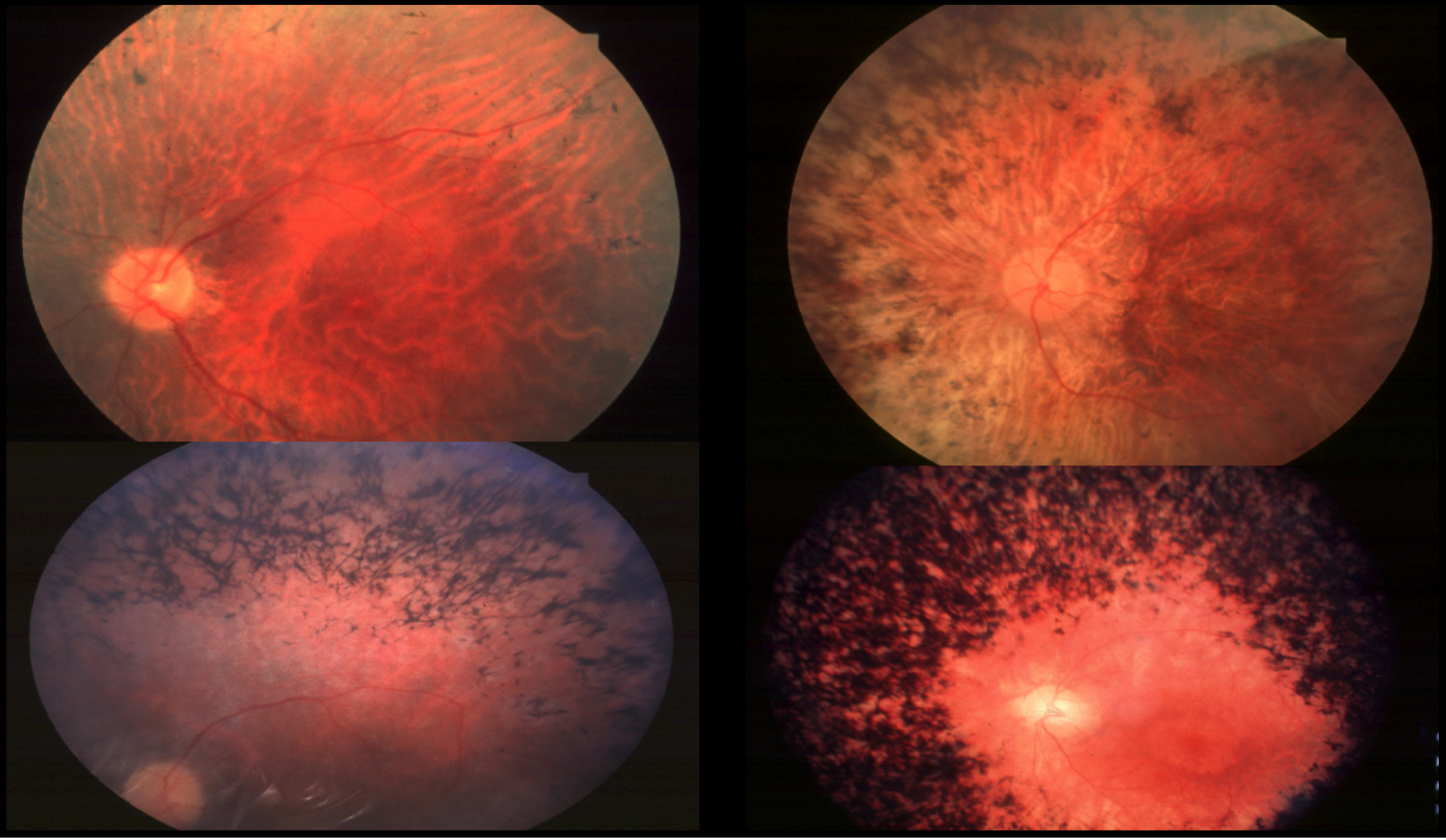
Retinitis Pigmentosa

Signs

- VA: 20/20 - NLP
- +- APD
- PSCC
- RPE hyperpigmentation (bone spicules) alternate with atrophic regions
- Attenuation of the arterioles
- Waxy pallor of the optic nerve head
- CME (severe cases of RP)

Chronic Visual Loss

Retinitis Pigmentosa



Chronic Visual Loss

Retinitis Pigmentosa

Investigations

- VF test
- Color testing (mild blue-yellow axis color defects)
- Dark adaptation study (reduced contrast sensitivity relative to VA)
- Genetic subtyping

Chronic Visual Loss

Retinitis Pigmentosa

Investigations

- OCT (CME)
- FFA
- ERG
- EOG

Chronic Visual Loss

Retinitis Pigmentosa

Systemic Associations

- hearing loss and RP
- ✓ Usher syndrome
- ✓ Alport syndrome
- ✓ Refsum disease
- Kearns-Sayre syndrome
- ✓ External ophthalmoplegia
- ✓ Lid ptosis
- ✓ Heart block
- ✓ Pigmentary retinopathy

Chronic Visual Loss

Retinitis Pigmentosa

Systemic Associations

- Abetalipoproteinemia
- Mucopolysaccharidoses
- Bardet-Biedl syndrome
- Neuronal ceroid lipofuscinosis

Chronic Visual Loss

Retinitis Pigmentosa

Treatment

- CAI: CME
- Vitamins ??
- Cataract: surgery
- Low vision aids
- Gene therapy !!