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## Resource view

Resource name	Ophthalmology
Resource description	Ophthalmology
Resource content	OPHTHALMOLOGY

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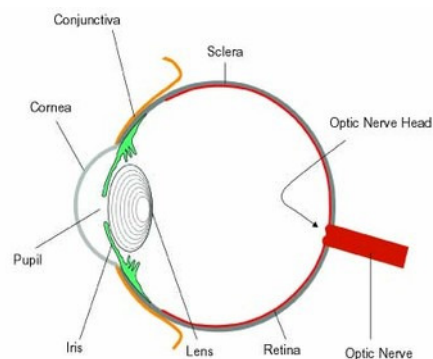
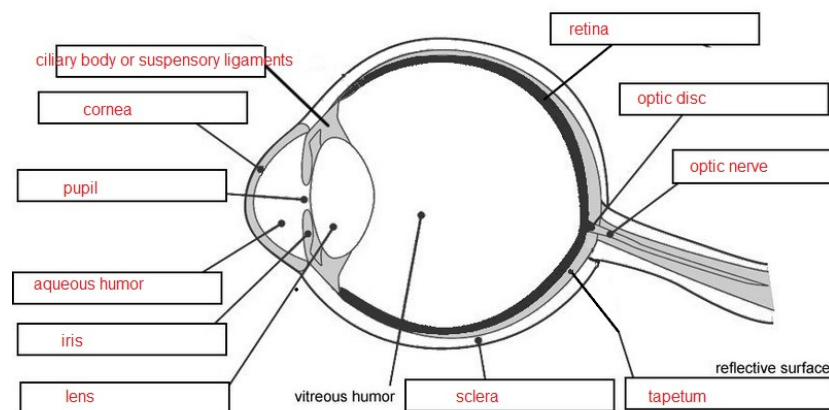
**1. ANATOMY OF THE EYE**

Sclera, conjunctiva, cornea, aqueous (iris, ciliary body are anterior uvea and choroid is posterior uvea)

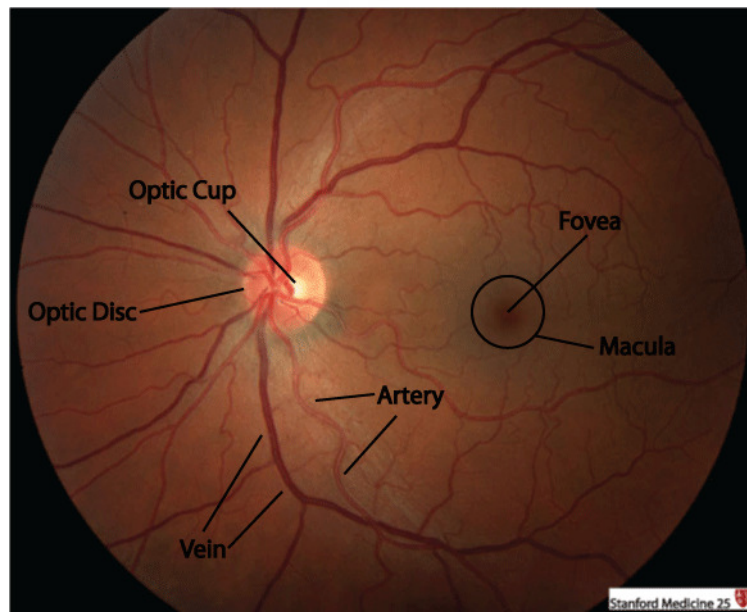
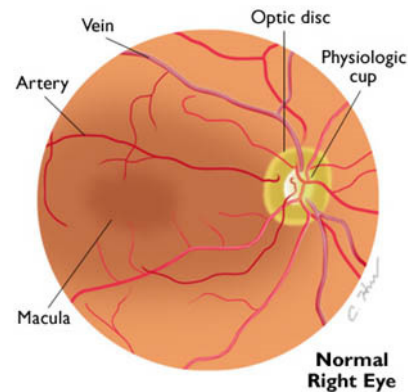
Lens with suspensory ligaments, vitreous

**Coats of the Eyeball**

1. Sclera
2. Choroid (Uvea)
3. Retina



- Fovea centralis (rich with cones)
- Optic disc is part of optic nerve that can be seen by ophthalmoscope
- Optic cup is depression in centre of optic disc.



Normal Retina

## 2. LOSS OF VISION

Causes:

### 1. CENTRAL RETINAL ARTERY OCCLUSION (Severe visual loss to finger counting or hand movement)

- Usually elderly patient
- Sudden onset of visual loss
- Associated with hypertension and diabetes

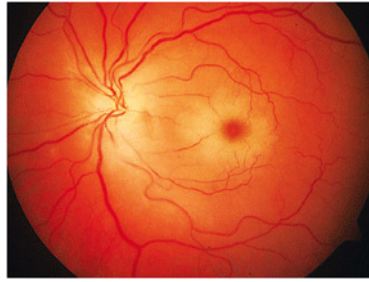
On examination: plus or minus carotid bruit

Fundoscopy: Optic disc is pale due to ischaemia. Cherry red spots on macula. Sometimes cholesterol is visible in the retinal arteries

Causes: Arteriosclerosis, Emboli

Investigations:

- Slit lamp examination
- Fundoscopy (Pale Optic Disc)
- Carotid Doppler- If carotid bruit



T/M:

- Macular massage
- Anterior chamber paracentesis
- I/V Acetazolamide if raised intraocular pressure

## 2. CENTRAL RETINAL VEIN OCCLUSION

Common in Obese men

- Also associated with HTN and diabetes with gradual onset
- It can have a sudden onset
- Usually patient wakes up in the morning with loss of vision due to decreased blood flow during night.

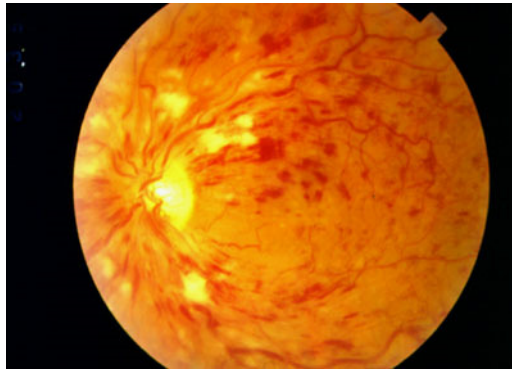
Risk Factors: Polycythemia Rubra Vera

- Cancer

Fundoscopy: flamed shaped haemorrhages and hard exudates. Stormy sunset or tomato splash appearance

Inx: -Slit Lamp

- Fundoscopy



Treatment: Reduce risk factors (DM, HTN, Smoking)

- If increased intraocular pressure –acetazolamide 500 mg IV

## 3. RETINAL DETACHMENT

Risk Factor: Myopia (or simply short sighted)

- May be caused by trauma
- Sudden onset
- Like a curtain coming down or like a flashing light like a camera

Investigations:

- Slit lamp investigation
- Fundoscopy

Treatment: Surgery (It will not resolve on its own unless surgery is done).

## 4. ACUTE CLOSED ANGLE GLAUCOMA

- Sudden loss of vision
- Acute red eye with pain
- Acute loss of vision with nausea and vomiting
- Halos on looking at light
- Plus or minus tunnel vision
- Nausea and vomiting indicate closed angle,

On examination: corneal oedema fixed and dilated pupil, IOP greater than 40mmHg, shallow anterior chamber

Risk factors: family history, common in female, increased age

Investigations:

-Measurement of intraocular pressure

Treatment:

- Acetazolamide intravenously 500mg
- Pilocarpine drops, dexamethasone drops (Steroid drops),
- Beta blockers- betoxalol, Timolol

If IOP pressure still persistently high then use Mannitol.

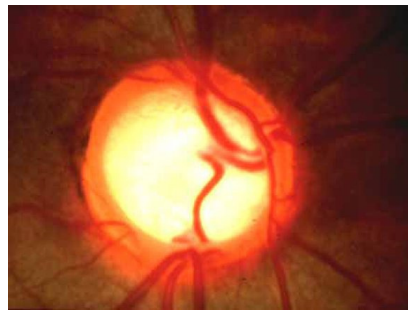
Dilating eye drops are contraindicated.

### 5. Optic Neuritis

- Common in multiple sclerosis
- Optic disc is pale
- Dull pain in the eye
- Usually young female patient (18 to 40 years in MS)
- Loss of red colour vision initially
- Sudden loss of vision, which is painless with possible similar symptoms in the past, which resolved completely (weeks or months).

### 3. CHRONIC GLAUCOMA

- No vomiting/nausea
- No headache or red eye
- Usually gradual loss of vision
- Fundoscopy shows disc cupping or simply increased cup: disc ratio



- Most people see halos around the light
- Can cause tunnel vision

Investigation: Measurement of IOP

Treatment -Eye drops - pilocarpine

- Beta-blocker eye drops

### 4. GIANT CELL ARTERITIS aka TEMPORAL ARTERITIS aka CRANIAL ARTERITIS

- Age >50 years
- Common in females
- Unilateral headache
- Sudden loss of vision usually unilateral, worse with combing hair
- Temporal Arteritis, cranial arteritis
- Weight loss, unilateral headache worse on combing hair, weakness in upper limbs

Investigations:

- ESR is raised- this is **initial** investigation
- Temporal artery biopsy is **definitive**

**NB:** If you don't treat one eye you will lose vision in the other eye.

Treatment: Admit, Initially intravenous Methyl prednisolone is given for three days, followed by oral steroid (Prednisolone) for 2-3 years high dose. Then reduce the dose gradually.

SIDE EFFECTS of STEROIDS

- 1) GIT Bleeding- give PPI to prevent
- 2) Osteoporosis- Give Bisphosphonates to prevent
- 3) DM- If ↑ glucose give short acting Insulin

- 4) HTN- Treat and monitor
- 5) Cataract- Regular check ups and surgery
- 6) Suppressed Immune System- watch out for fever
- 7) Cushing Syndrome
- 8) Addison's disease

## 5. MACULAR DEGENERATION:

DRY

WET

### 1. DRY AGE-RELATED MACULAR DEGENERATION

Risk factors: Increasing age, smoking, alcohol and female sex.

#### Symptoms:

- Gradual onset of decreased vision, initially to read and recognise faces due to loss of central field of vision.
- Central Scotoma (walking into desks)
- It is due to photoreceptors
- Patient sees wavy lines
- Macula has pigmentation geographically
- Bumps into objects
- 30% inheritance

Investigation: Fundoscopy or slit lamp examination you see a large area of geographical atrophy at the macula and pigmentation.



Treatment: No treatment, just reduce the risk factors and supportive treatment.

### 2. WET AGE RELATED MACULAR DEGENERATION

- Less common than dry macular degeneration
- There is accumulation of fluid, which decreases the membranes of the macula
- There sudden loss of vision
- On examination of the fundus you see grey or yellow plaque like membrane.

### 6. Transient Ischemic Attack (TIA)

- Sudden onset of symptoms such as visual loss, dysphasia, or weakness in the limbs. Symptoms resolve quickly within minutes or hours (< 24hrs).
- Risk factors include: diabetes, HTN, AF, valvular heart disease
- Amaurosis fugax-loss of vision like curtain coming down. It resolves on its own.

### 7. CATARACT

- This is opacity in the lens
  - Usually in elderly patient
  - Usually causes blurred vision
  - Bilateral cataract causes gradual visual loss plus or minus frequent change of glasses
- Investigation: 1) Slit lamp 2) Fundoscopy
- Treatment: Surgery

**8. OPTIC ATROPHY (MS=Optic Neuritis, GCA)**

- Optic disc is pale
- Secondary to glaucoma or retinal damage
- or due to ischemia ( retinal artery occlusion)
- Toxic causes: tobacco, methanol, lead arsenic they cause amblyopic
- M.S Syphilis, external pressure on ^ nerve

**9. KERATITIS****9.1 BACTERIAL KERATITIS**

- Inflammation of cornea
- This is the commonest cause of Infectious Keratitis
- Bacterial Keratitis covers all organisms, which causes Keratitis in a group of bacteria.

CAUSES: The commonest cause is Pseudomonas Aeruginosa especially in those wearing contact lenses, staphylococcus aureus/epidermidis, and streptococcus.-Pseudomonas causes purulent discharge

SYMPTOMS: Increasing foreign body sensation, pain, red eyes, photophobia and reduced vision (which is not the case in conjunctivitis)

Investigation: eye corneal swab and culture.

Treatment: Antibiotics Cefuroxime eye drops

**9.2 Acanthamoeba Keratitis**

This is sight threatening caused by free living amoeba (a protozoa) which is found in tap water, swimming pools, fresh water and soil

- Also common in contact lens wear
- Especially those that swim with contact lenses or washing them under tap water.

Investigation: Swab and culture

Treatment: anti-septic e.g. eye drops Chlorhexidine

**9.3 FUNGAL KERATITIS**

- Common in contact lens wear, diabetes, immunocompromised, agricultural trauma (farmers).
- Cause is fungus aspergillus or fusarium

INVESTIGATION: swab and culture

TREATMENT: Topical Amphotericin.

**9.4 VIRAL KERATITIS**

- Usually follows an upper respiratory tract infection.
- Commonest cause is herpes simplex virus
- Also called herpes simplex keratitis
- Presents with red eye, watering, photophobia and foreign body sensation.
- Herpes simplex keratitis causes **dendritic ulcer**

**On examination** of the cornea there is 1 or more linear branching dendritic ulcers with terminal bulb appearance at the ends.

**-If topical steroid are used the dendritic ulcer enlarges into large geographical ulcers which can lead to total blindness.**

- Very painful keratitis
- Therefore steroid drops are contraindicated

INVESTIGATION: Florescence examination of the cornea.

-Diagnosis is clinical.

TREATMENT: Topical Acyclovir for 2 weeks

**9.5 EXPOSURE KERATITIS**

- This is due to inability to close the eye and the cornea is constantly exposed to air and becomes dry.
- Common with facial nerve palsy and sometimes seen after drinking a lot of alcohol
- Treatment: eye lubricant/artificial tears

**Orbital Cellulitis**



#### 10. FOREIGN BODY:

METALS      OTHERS (wood, cotton, sand and grass etc.)

##### METALS

-Welders

-In cutting metals

Can cause penetrating trauma- Intra-ocular Foreign Body

Investigations: X-ray orbit

OTHER FOREIGN BODIES: wood especially when working in the garden, cotton, grass

Examine with florescence and remove the foreign body

#### 11. ANTERIOR UVEITIS (Iris + Ciliary Body)

-Inflammation of the iris is called Iritis, which is part of anterior Uveitis.

-Inflammation of ciliary body and iris (anterior uvea)

-Associated with Ankylosing Spondylitis (Young male with back pain)

-Rheumatoid Arthritis, Sarcoidosis, SLE, Bechet's disease, Juvenile idiopathic arthritis and inflammatory bowel disease.

Symptoms: pain, photophobia, blurred vision, red eye,

Investigations:

-Slit lamp examination shows cells in anterior chamber with flare, pupils are small (Miosis) and irregular

-Human Leucocyte antigen HLA B27 association could be a cause (sero-negative arthritis)

Treatment:

-0.5% Prednisolone drops

-Cyclopentolate (dilating drops)

#### 12. RED EYE:

*CAUSES:*

1. Viral conjunctivitis
2. Bacterial conjunctivitis
3. Foreign body
4. Closed angle glaucoma
5. Anterior Uveitis
6. Subconjunctival haemorrhage
7. Cluster headache
8. Corneal abrasion
9. Trauma
10. Scleritis
11. Episcleritis
12. Keratitis

##### 12.1 Sub conjunctival Haemorrhage:

-No loss of vision

- Spontaneous painless bleed

-Usually in patients with HTN or Warfarin (raises INR)

Investigations: Check for coagulation and blood pressure

Treatment: Reassurance if bloods are normal. Usually resolves in 10 to 14 days.

##### 12.2 Viral conjunctivitis:



-Acute red eye with lacrimation

**-Watery discharge**

-This is the commonest cause of conjunctivitis

-Matting of eye lids in morning

-Photophobia and FB sensation in the eye.

Treatment: -Chloramphenicol drops to prevent bacterial infection or simply

-Topical antibiotics

**12.3 Bacterial Conjunctivitis:**

Acute red eye, lacrimation, foreign body sensation in the eye

**-Purulent discharge**

-Matting of lids in the morning

-Easily spreads in the family and hence members of same family may also have similar symptoms

Treatment -Chloramphenicol drops or simply topical antibiotics

**12.4 Corneal Abrasion:**

Common in adults (usually mothers) after fingernail scratch by a baby

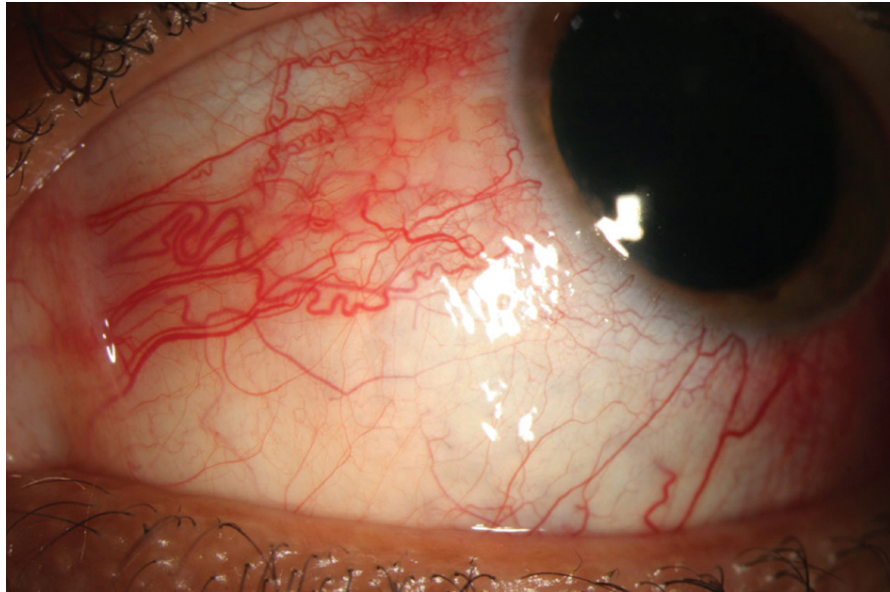
Treatment:

- Usually heals on its own in 2 to 3 days.
- Topical antibiotics i.e. Chloramphenicol eye drops to prevent infection.

**12.5 Episcleritis**

- Inflammation below the conjunctiva in the Episclera, is often seen with an **inflammatory nodule**.
- Sclera looks blue below engorged vessels
- Dull eye aches with tenderness over inflamed area
- It might complicate Rheumatic fever, PAN and SLE

**Rx:** Topical or Systemic NSAIDS.



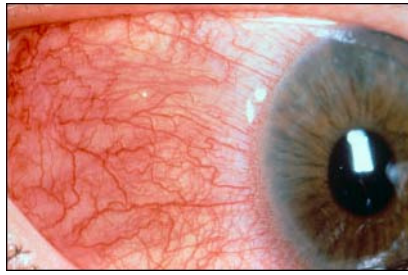
**12.6 SCLERITIS**

More significant pain when associated with connective tissue disease

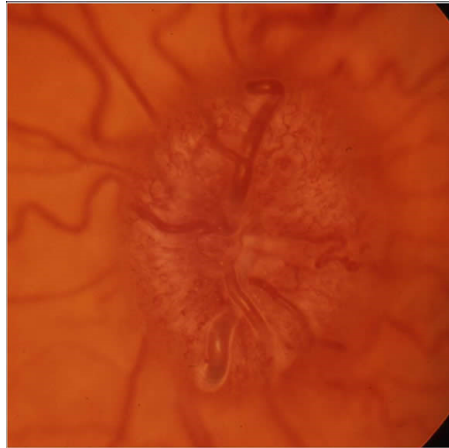
Scleral thinning

**Rx** Refer to ophthalmologist

Most will need oral steroid drops or immunosuppressive therapy

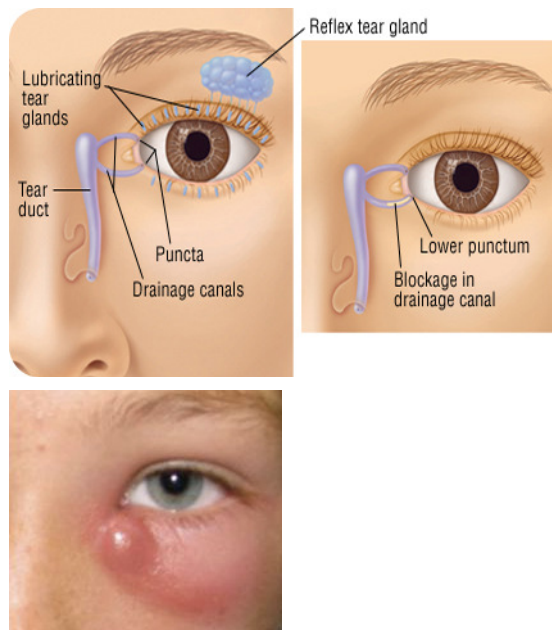
**FUNDOSCOPY:**

1. Optic neuritis=The optic disc is pale and patient has loss of vision
2. Retrobulbar Neuritis=optic disc is normal and patient has loss of vision
3. Papilloedema (pictured below) =Optic disc is oedematous and congested but patient has no loss of vision.

**13. ACUTE DACRYOCYSTITIS**

Inflammation of the lacrimal gland and tear ducts leading to formation of **mucocoele** i.e. enlarged lacrimal gland with pus. Usually located on the nasal side of eye. When you press the swelling pus is discharged.

**Treatment:** Oral antibiotics

**14. DRY EYES:**

Sjogren's syndrome is a common disease which causes dry eyes, dry mouth and dry vagina

- Dry vagina causes dyspareunia (Pain during sexual intercourse)
- Dry mouth causes difficulty in swallowing

Inx: **Schimmers test** positive

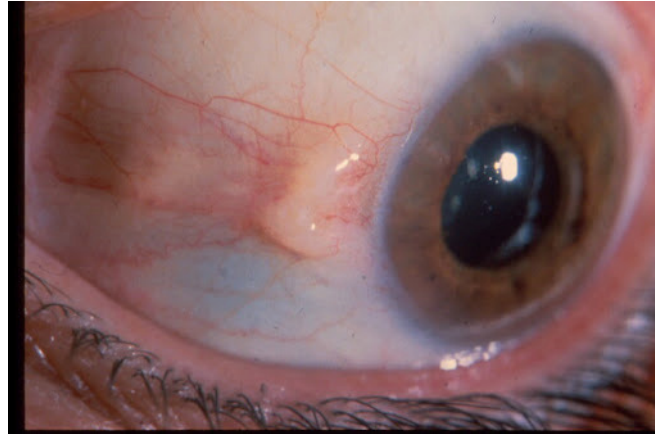
Treatment: Artificial tears (Visco tears)

## 15. EXTERNAL EYE PATHOLOGIES

### 15.1 Pinguecula

Degenerative yellow nodules on conjunctiva on either sides of cornea (typically nasal sides)

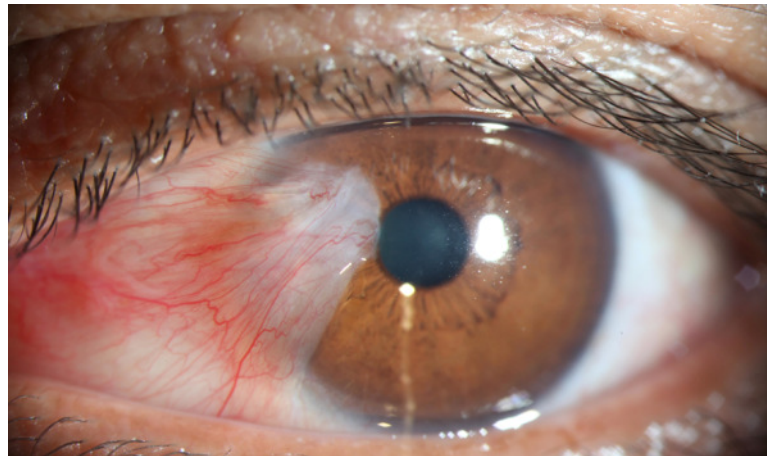
**Rx:** Topical steroid



### 15.2 Pterygium:

Degenerative wing shaped white/yellow nodules that encroach on to the corneal corners

**Rx:** Steroid can help but surgery may be needed



### 15.3 Ophthalmic shingles

This is the herpes zoster infection of the ophthalmic branch of 5<sup>th</sup> cranial nerve i.e. the trigeminal nerve. It is common in elderly due to immunocompromised state.

**S/S:** Pain, tingling around the eye and burning sensation on the scalp. There is a visible blistering rash.

May cause:

- Mucopurulent conjunctivitis
- Scleritis
- Epscleritis
- Visual loss
- V nerve palsy – which presents as loss of sensation on the cornea
- Keratitis
- Iritis
- Optic Atrophy

**Rx:** Acidovir Po for 14 days

### 15.4 Retinoblastoma:

Most common primary intra ocular tumour in children.

**S/S:**

- Strabismus
- White pupil
- Absent red reflex

**Rx:** Enucleation (to take the eye out) with radiotherapy (Not usually used nowadays)

Focal procedures to preserve eye

**16. PUPILS**

Muscles of the Eye: Superior Oblique is supplied by the 4<sup>th</sup> cranial nerve and the lateral rectus by the sixth. The rest are innervated by the 3<sup>rd</sup> Nerve

LIGHT REFLEX (Pupillary Reflex)- Direct and Consensual

Afferent – Optic nerve injury – absent direct reflex

Efferent – Oculomotor Nerve injury

Causes of fixed dilated pupils:

- 3<sup>rd</sup> CN injury
- Mydriatics (dilating eye drops)
- Trauma to iris
- Acute Glaucoma

**1. Adie Pupil**

→ Large Pupil

→ Poor accommodation

→ Degeneration of the parasympathetic ganglion

**2. Argyll Robertson Pupil**

→ Small and irregular pupils poorly react to light but good accommodation.

→ Commonly caused by Syphilis.

Pupils of different sizes = anisocoria

**17. LENS**

ERRORS OF REFRACTION

1) Myopia (short sightedness)

Concave lenses for correction

2) Astigmatism: defect in the curvature of lens and the cornea

Cylindrical lenses for correction

3) Hypermetropia: (long sightedness)

Convex lenses for correction

4) Presbyopia: It usually starts at the age of 40. In elderly lens becomes stiffer – long sightedness

Loss of accommodation.

**18. The EYE in DM**

Structural changes: Accelerates the formation of cataract

Retinopathy:

- Background Retinopathy: Micro aneurysms, dot & blot haemorrhage and hard exudates
- Pre-Proliferative: Micro aneurysms, dot & blot haemorrhages plus soft exudates (aka cotton wool spots)
- Proliferative Retinopathy: new vessel formation
- Maculopathy: leakage close to haemorrhage exudates^ macula

**Rx:**

1. Good control of DM, Heart disease, Renal disease, Increased lipids (cholesterol)
2. Photo coagulation for maculopathy & proliferative retina

**19. BLEPHARITIS:**

Inflammation on the lid margins. Very common

- This is chronic lid inflammation.
- Symptoms
- Burns, itching, FB sensation
- Hard + brittle scales

- An external style may develop if follicles infected

## 20. Tears and Lacrimation

- Keratoconjunctivitis Sicca due to decreased tear production
- Sjogren's syndrome
- Mumps
- Sarcoidosis
- Lymphoma
- Leukaemia
- SLE
- Scleroderma

Investigation: Shimmer's test

Treatment: artificial

## 21. CHEMICAL INJURY

The main treatment is irrigation of the eye with normal saline.

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