

Ophthalmology

World of Revision

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Instructions

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BASIC ANATOMY OF THE EYE

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General Features

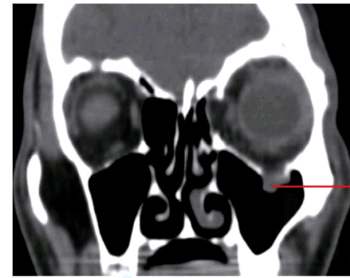
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Shape : Aspherical (Oblate spheroid).

Volume : 6 mL.

Location : Orbit → 4 walls.

- Weakest wall : **Floor**.
- Thinnest wall : **medial wall**.
-  m/c orbital fracture : Blow out fracture.



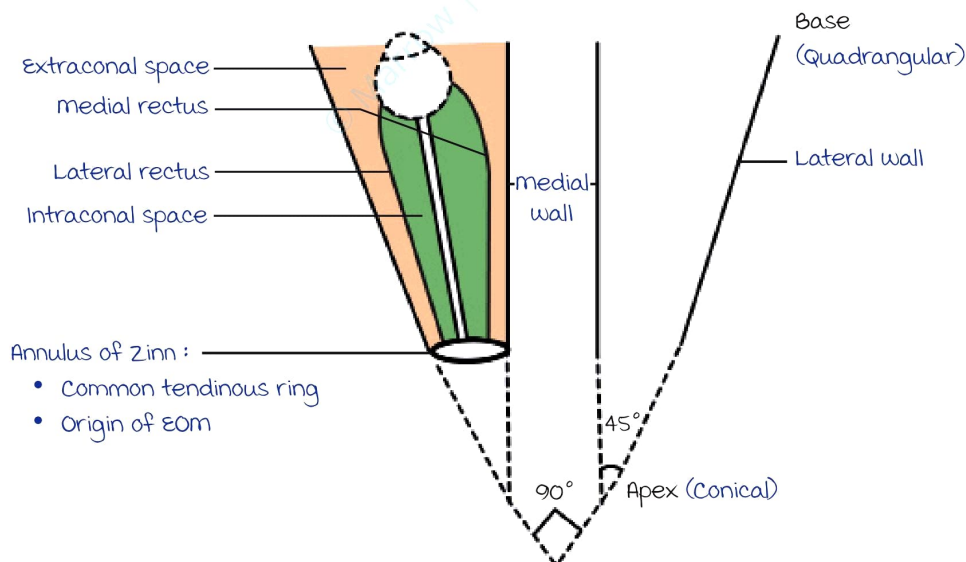
Blow out fracture

Note : Tear drop sign Infraorbital nerve anaesthesia Double diplopia (In superior & inferior eye movements)

Routes of Local Anaesthesia & Drug Administration

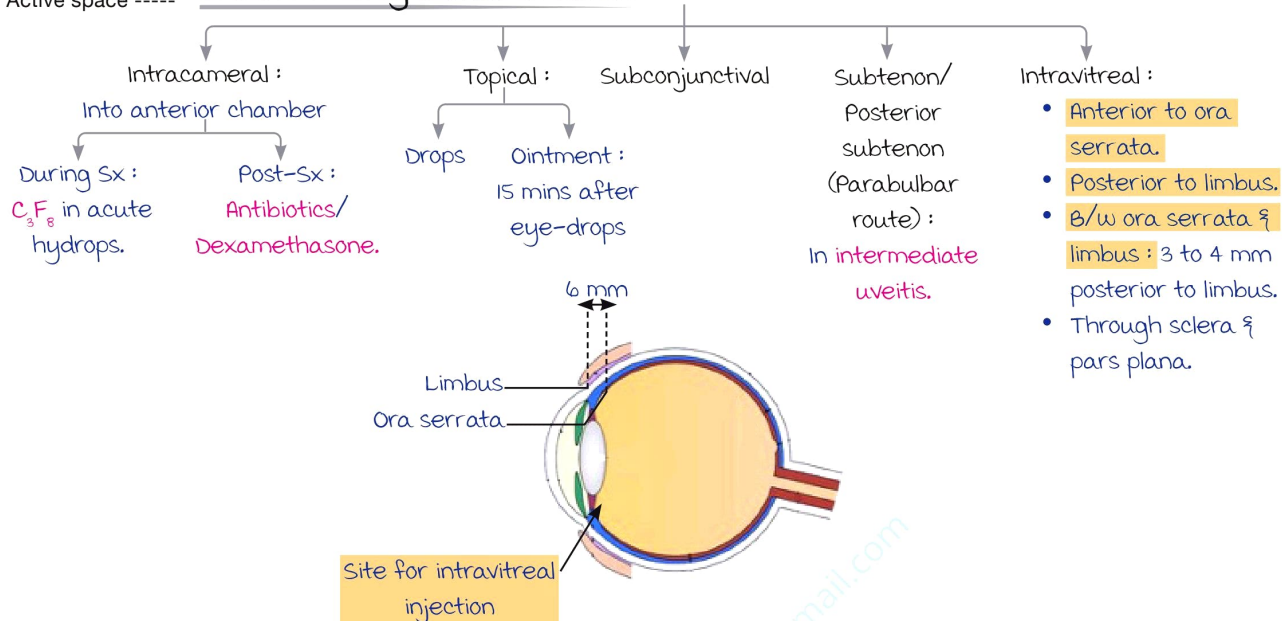
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Routes of Local Anaesthesia :



- Retrobulbar  : Intraconal space (Retrobulbar hemorrhage)
- Peribulbar  : Extraconal space → 24 G needle (↓ complications).

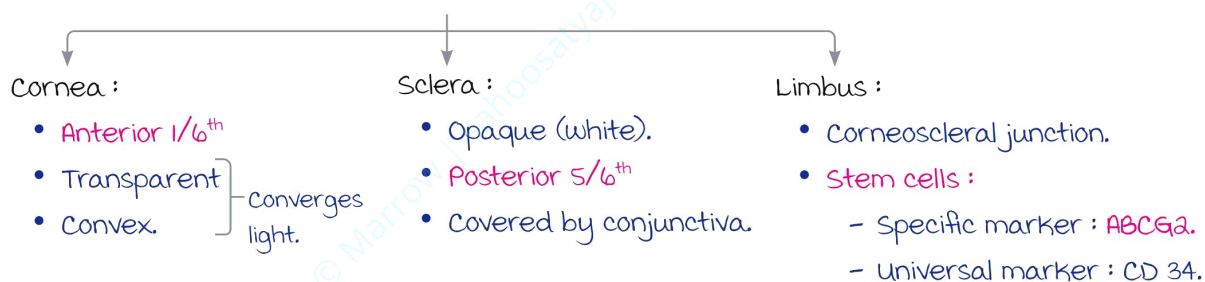
----- Active space ----- **Routes of Drug Administration :**



Layers of the Eyeball

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Outermost :

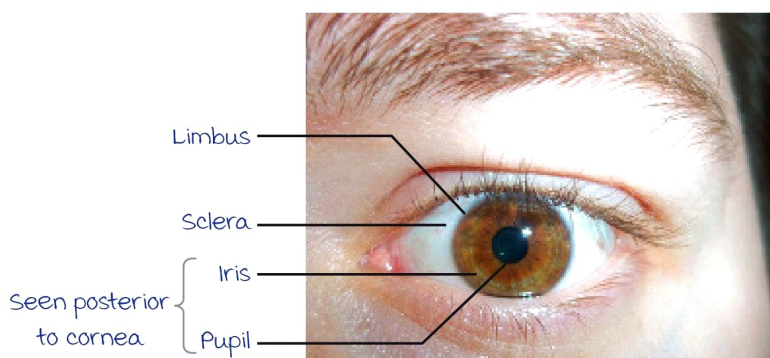


Applied aspects :

1. Limbal dermoid :

- Benign tumour.
- Choristomatous tissue ⊕ (Hair follicles, teeth, etc.).

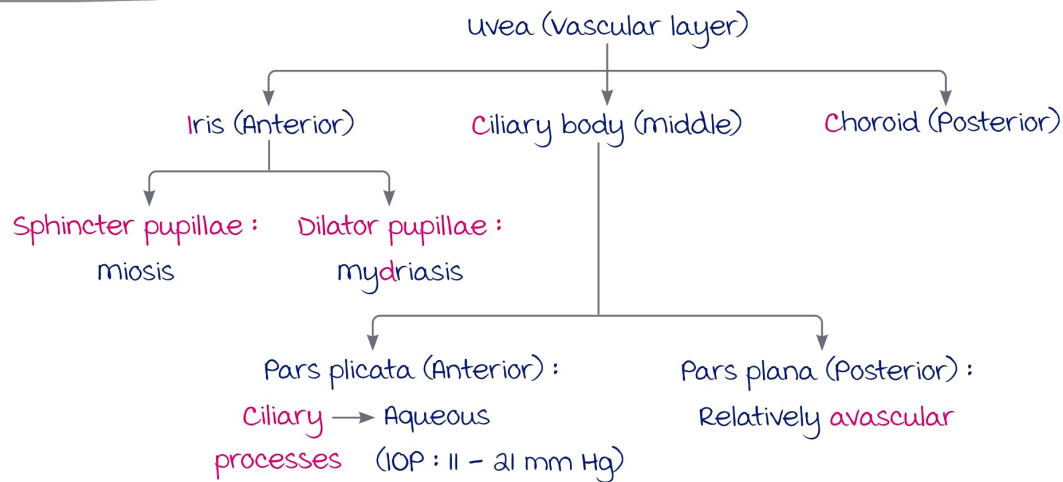
2. Pterygium : Conjunctiva grows over cornea.



Limbal dermoid

middle 👁 :

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👁 Sphincter Pupillae	👁 Dilator Pupillae
Parasympathetic : III CN ↓ Inferior branch to inferior oblique muscle ↓ Short ciliary nerve	Sympathetic : Hypothalamus ↓ 1st order neuron Cilio-spinal (Budge) center (C8 - T1) in Spinal cord Horner's syndrome ↓ 2nd order neuron (Pre-ganglionic) Superior cervical ganglion ↓ 3rd order neuron (Ascends along ICA to cavernous sinus) Long ciliary nerve Pancoast Tumor

Inner :

Retina : Neuro-sensory layer.

Horner's Syndrome 👁

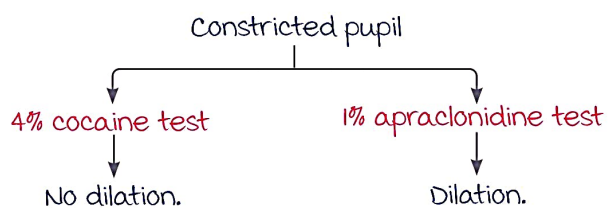
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Oculosympathetic palsy.

Features :mnemonic : **HI MAPLE**.

- **H**eterochromia iridis : Hypochromic → Congenital only.
- **I**nferior eyelid elevation.
- **M**iosis : Dilator pupillae paralysis.
- **A**nhidrosis (I/L).
- **P**toxis : muller's muscle palsy.
- **L**oss of cilio-spinal reflex.
- **E**nophthalmos.

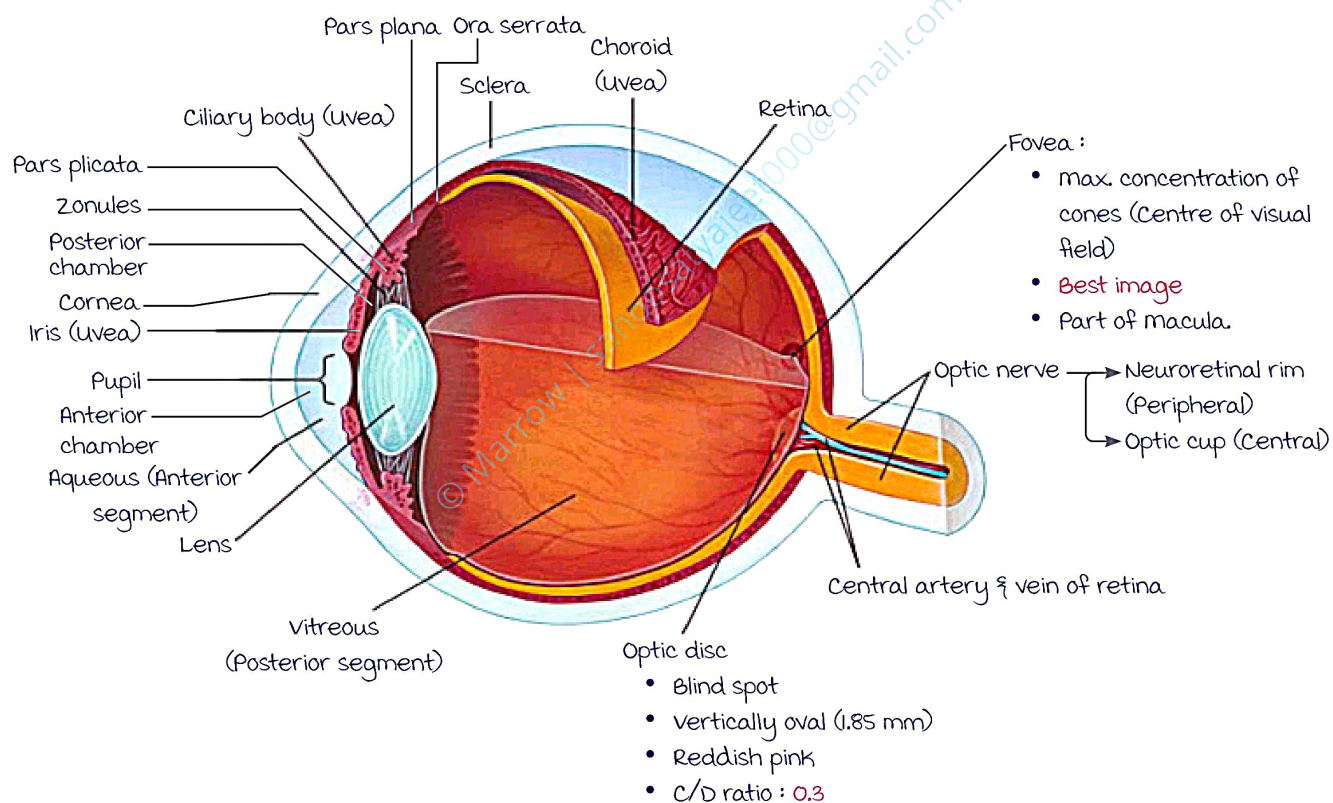
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Diagnosis :

Localization :

**Cross - Section of Eyeball**

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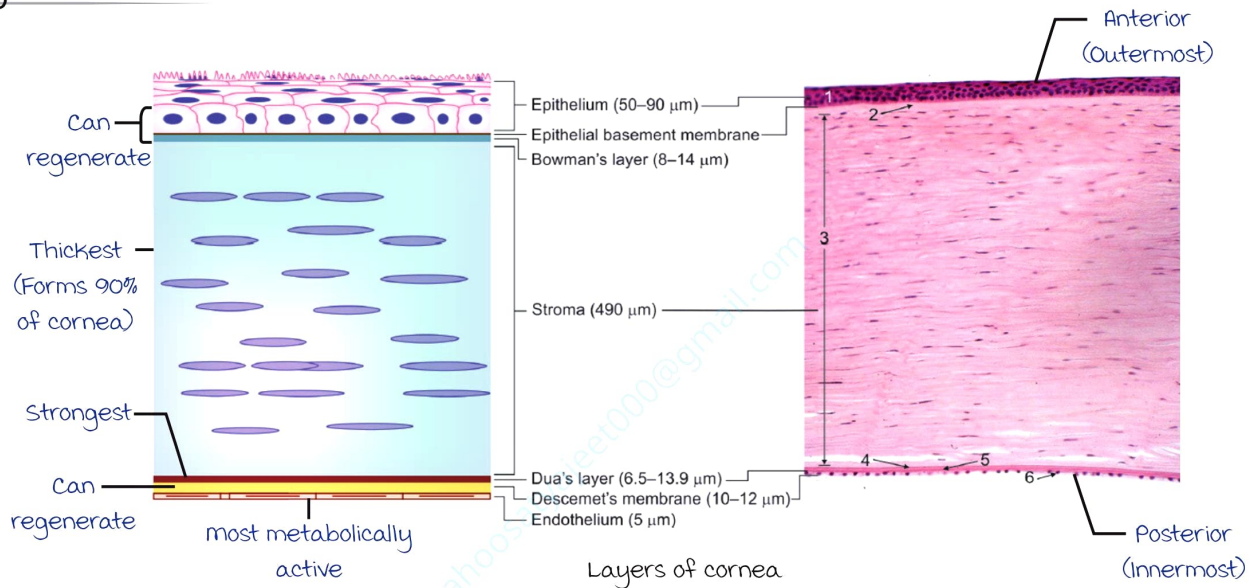
CORNEA AND SCLERA

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Anatomy of Cornea

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Layers of Cornea :



1. Epithelium :

- Non-keratinized stratified squamous epithelium.
- Layers :
 - Superficial : Squamous (microvilli $\oplus$) $\rightarrow$ Adhesion to innermost/mucin layer of tear film).
 - Basal : Columnar (mitosis $\oplus$) $\rightarrow$ Regeneration).

2. Bowman's layer :

- False basement membrane (PAS -ve).
- Acellular
(No regeneration $\rightarrow$ Heals by scar formation $\rightarrow$ Corneal opacity $\rightarrow$ LOV).
- Corneal opacities  :

	Pupillary margin	Iris details	Depth of involvement
Nebular (Faintest)	visible	visible	Bowman's & superficial stroma
macular	visible	Not seen	$\leq 1/2$ stroma
Leucoma (most opaque)	Not seen	Not seen	$\geq 1/2$ stroma

Nebular opacity : maximum discomfort (Induces irregular astigmatism).

Leucoma : maximum visual loss.

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3. Stroma : made of collagen (m/c Type I) & GAGs (m/c Keratan sulphate : Corneal transparency)

4. Dua's layer : Strongest corneal layer.

5. Descemet's membrane (DM) :

- Secreted by underlying endothelium.
- Regeneration (+).
- Shwalbe's line : Peripheral termination of DM.

6. Endothelium :

- metabolism (+).
- maintains corneal transparency.

No. of endothelial cells (Cells/mm ²)	Significance
2400-3000	Normal
<2400	Corneal compensation (Polymegathism & polymorphism)
<500 (Critical point)	Corneal decompensation → Edema → Hazy cornea → LOV

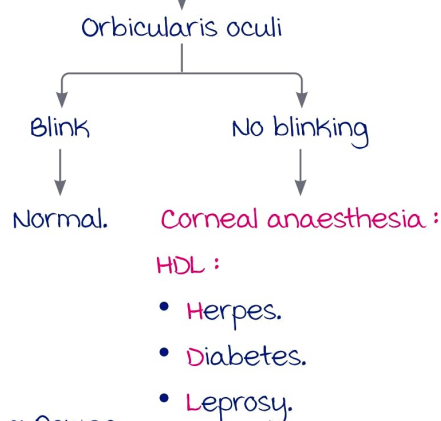
Counted using specular microscopy

Nerve Supply (Sensory) :

TON : Trigeminal → Ophthalmic → Nasociliary.

Test for corneal sensations :

Cotton wisp → Touch cornea → CN V (Afferent) → Brain → CN VII (Efferent)



General Properties of Cornea :

Corneal shape : Convex (Converging) } Curvature ∝ Power
 Corneal power : +43D to +44D
 Corneal colour : Transparent (Appears black).