

Introduction to Ocular Anatomy

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Key structures, functions, and relationships of the human eye

1. Overview of the Eye

Feature	Description	Primary Function
Globe	Spherical organ ~24mm in diameter	Receives and focuses light
Orbit	Bony cavity protecting the globe	Provides support and attachment for extraocular muscles, nerves, vessels
Lacrimal apparatus	Lacrimal gland, ducts, puncta, canaliculi, sac	Produces and drains tears to keep the surface moist and clear

2. External Structures

1. Eyelids (palpebrae)

- Upper and lower lids; contain **meibomian glands** (lipid secretion) and **ciliary glands** (mucus).
- Protect the eye and spread the tear film during blinking.

2. Conjunctiva

- Thin, vascularized mucous membrane lining the inner eyelids and covering the anterior sclera.
- Provides a barrier against microbes and contributes to tear film stability.

3. Lacrimal Gland

- Located in the superolateral orbit; secretes aqueous component of tears.

4. Extraocular Muscles (six)

- **Four recti** (superior, inferior, medial, lateral) – primary movers.

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- **Two obliques** (superior, inferior) – provide torsional movement.
 - Innervated by cranial nerves III, IV, VI.
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3. Layers of the Eye (from outside to inside)

Layer	Sub?components	Main Role
Fibrous Tunic	Sclera (white, collagenous), Cornea (transparent, avascular)	Maintains shape; cornea refracts light
Vascular (Uveal) Tunic	Choroid (vascular, pigment), Ciliary body (ciliary muscle & processes), Iris (colored part, pupil regulator)	Supplies nutrients; controls lens shape and pupil size
Neural (Sensory) Tunic	Retina (photoreceptors, bipolar, ganglion cells)	Converts light into neural signals

4. Detailed Structures

4.1 Cornea

- **Layers (anterior ? posterior):** Epithelium ? Bowman's layer ? Stroma ? Descemet's membrane ? Endothelium.
- **Key points:** Avascular, provides ~2/3 of eye's total refractive power; endothelium pumps fluid to keep cornea clear.

4.2 Sclera

- Dense collagen, continuous with corneal stroma.
- **Insertion site** for extra?ocular muscles and Tenon's capsule (protective fascial sheath).

4.3 Anterior Chamber

- Space between corneal endothelium and iris.
- Filled with aqueous humor (produced by ciliary processes) ? nourishes cornea & lens, maintains intra?ocular pressure (IOP).

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4.4 Iris & Pupil

- **Iris:** Pigmented muscle (sphincter & dilator) controlling pupil diameter.
- **Pupil:** Central aperture; size adjusts to light intensity (pupillary reflex).

4.5 Lens

- Transparent, biconvex, suspended by zonular fibers (suspensory ligaments) attached to the ciliary body.
- **Accommodation:** Ciliary muscle contraction relaxes tension on zonules, allowing the lens to become more convex for near vision.