

Anatomy of the Eye

Anatomy of the Eye – Study Notes

1. Overview

The eye is a complex, spherical organ that focuses light onto the retina to produce visual images. It is composed of three functional layers (outer, middle, inner) and several supporting structures.

Layer	Main Structures	Primary Functions
Outer (Fibrous) Layer	Sclera, Cornea, Episclera, Conjunctiva	Provides protection, maintains shape, and allows light entry (cornea).
Middle (Vascular) Layer	Choroid, Ciliary body, Iris	Supplies nutrients, controls lens shape (ciliary body), regulates pupil size (iris).
Inner (Neural) Layer	Retina, Optic nerve, Fovea, Macula	Detects light, converts it to neural signals, transmits visual information to the brain.

2. Outer (Fibrous) Layer

Structure	Description	Key Features
Sclera	Dense, white connective tissue surrounding the globe (~90% of the eye's surface).	Provides rigidity; attachment site for extraocular muscles.
Cornea	Transparent, avascular dome at the anterior pole.	Major refractive surface (~2/3 of total eye power); no blood vessels = clear vision.
Episclera	Loose vascular tissue between sclera and conjunctiva.	Supplies blood to outer eye.
Conjunctiva	Thin mucous membrane covering sclera (bulbar) and lining eyelids (palpebral).	Produces tear film mucins; protects against debris and infection.

3. Middle (Vascular) Layer

Structure	Description	Functions
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Choroid	Pigmented, highly vascular layer between sclera and retina.	Supplies oxygen/nutrients to outer retina; absorbs stray light (reduces glare).
Ciliary Body	Ring of tissue containing ciliary muscle and processes.	• Ciliary muscle: changes lens curvature for accommodation. • Ciliary processes: produce aqueous humor.
Iris	Colored diaphragm with radial muscles (dilator & sphincter).	Controls pupil diameter ? regulates light entry.
Pupil (aperture)	Central opening in the iris.	Adjusts size to modulate retinal illumination.

4. Inner (Neural) Layer

Structure	Description	Important Points
Retina	Multi-layered neural tissue lining the back of the eye.	Contains photoreceptors (rods & cones), bipolar cells, ganglion cells.
Photoreceptors	• Rods: highly sensitive, peripheral vision, low-light (scotopic). • Cones: three types (S-blue, M-green, L-red), color vision, high acuity (photopic).	
Macula	Central 5mm region of the retina, rich in cones.	Critical for detailed central vision.
Fovea	1mm depression at the center of the macula; only cones, no overlying vessels.	Highest visual acuity; responsible for sharp, color vision.
Optic Nerve (CN II)	Bundle of retinal ganglion cell axons exiting the eye.	Transmits visual information to the brain; creates a physiological blind spot where it exits.
Internal Limiting Membrane		