

Introduction of ophthalmology

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Objectives:

- 1.To know the structure of the eye in layer & in segments and chambers.
- 2.To know the blood and nerve supply of the eyeball,
- 3.Quick eye assessment
4. Identification of visual acuity and visual field.
5. Glossary of Terms.

Describe the eyeball?

Upper eyelid

Plica
semilunaris

Lacrimal
caruncle

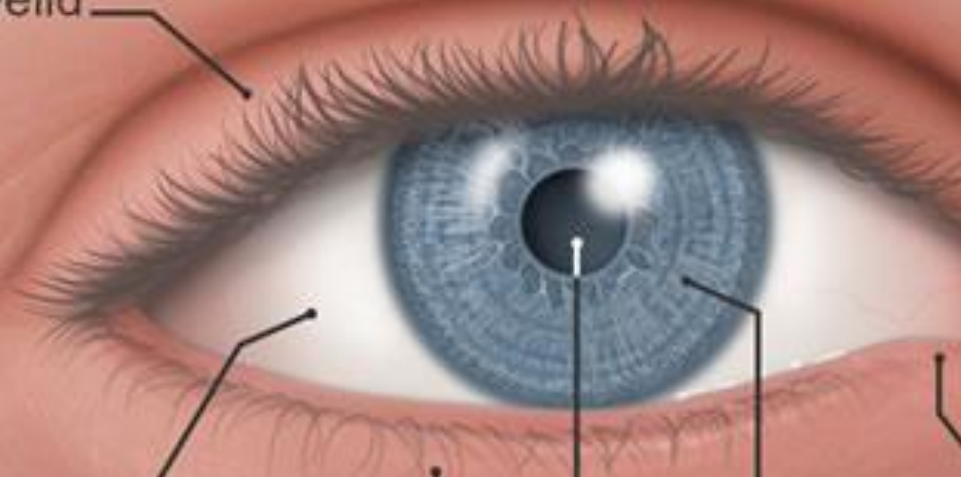
Sclera

Lacrimal papilla

Lower eyelid

Pupil

Iris



The eyeball lies in a quadrilateral pyramid bony cavity on either side of the root of the nose called the **orbit**. usually with a two medial parallel walls while the lateral wall performing a 45 degree with the medial wall.

-at birth the anteroposterior diameter of the eye is 17.5 mm. it reaches 24mm in adults.

- A cross-sectional view of the eye shows:

- **Three different layers**

- 1.The external layer the(tonic layer), formed by the **sclera 5/6** and **cornea 1/6**, **the anterior part of the sclera is covered by a transparent mucus membrane called the **conjunctiva** which is reflected to the inner side of the eyelids superiorly and inferiorly.

2. The intermediate layer (the uveal tract or vascular layer), divided into three parts: **iris , ciliary body** (muscular part for accommodation and secretory part for secretion of the aqueor humor fluid) and posterior (**choroid**)

- 3.The internal layer or the sensory part of the eye (the nervous layer), **the retina** and **the optic nerve head** or disc.

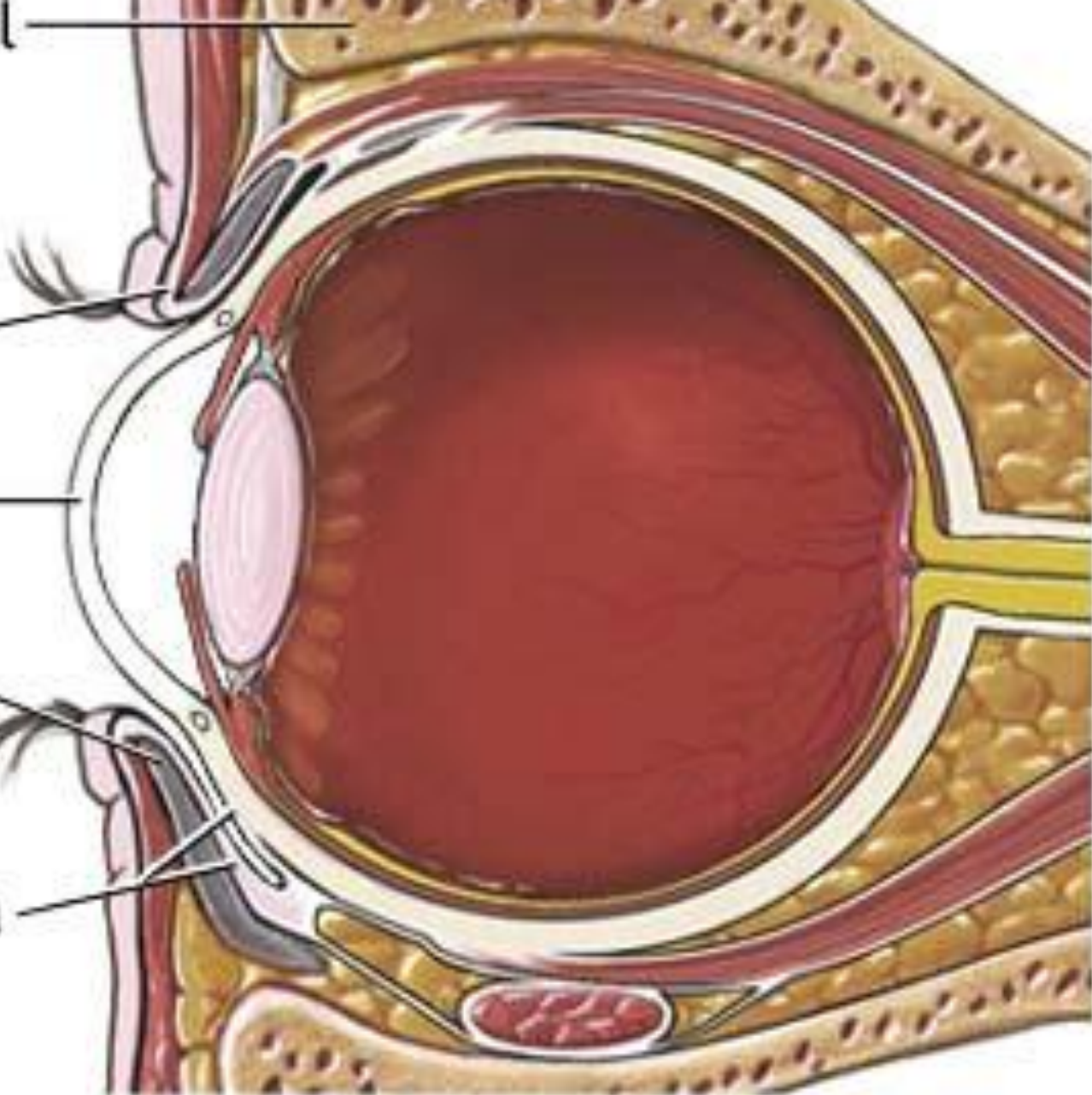
Skull

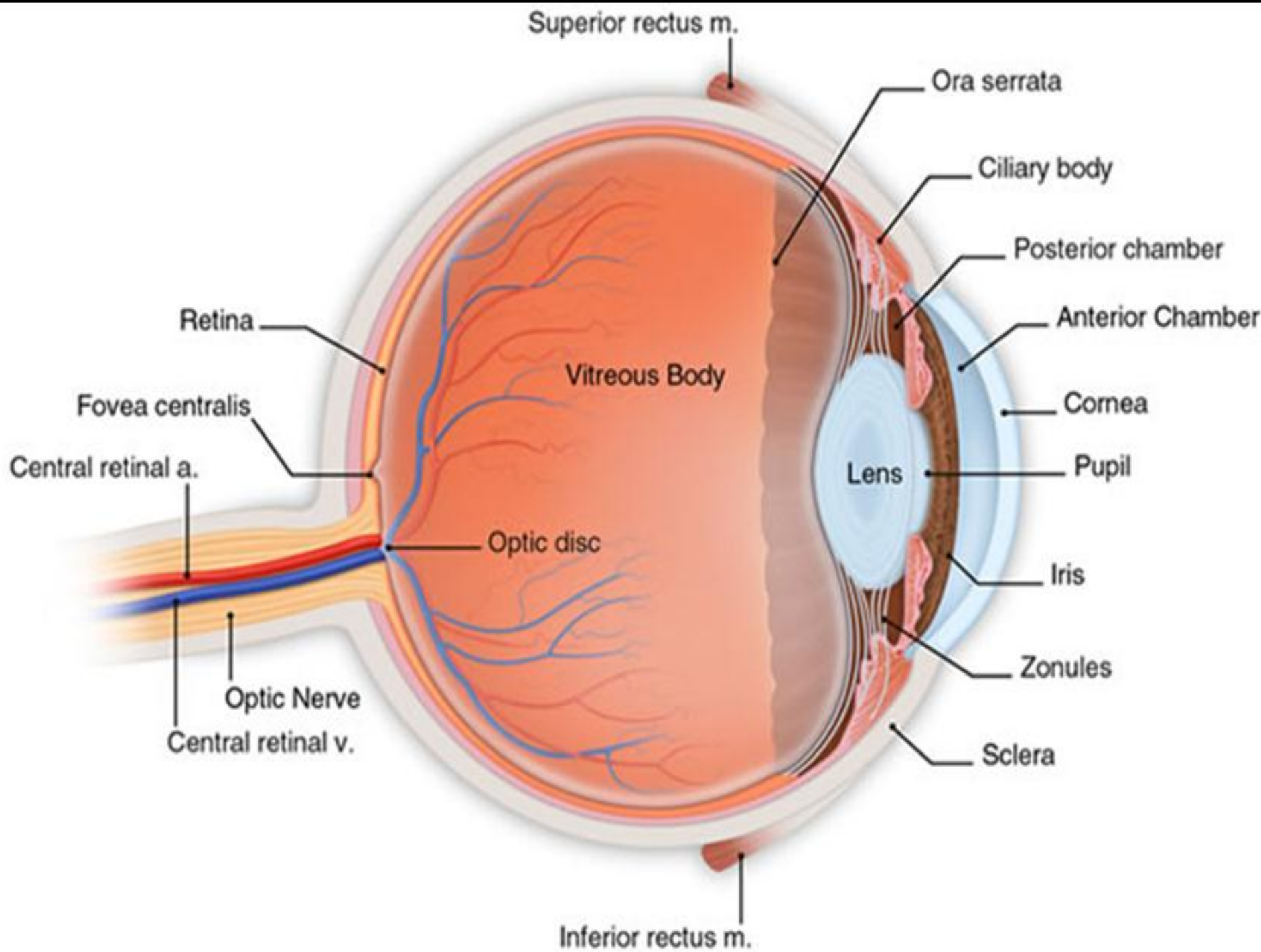
Upper lid

Cornea

Lower lid

Conjunctiva





Segments and chambers of the eye:

The eye divided by the lens into anterior and posterior segment

The anterior segment divided by the iris into:

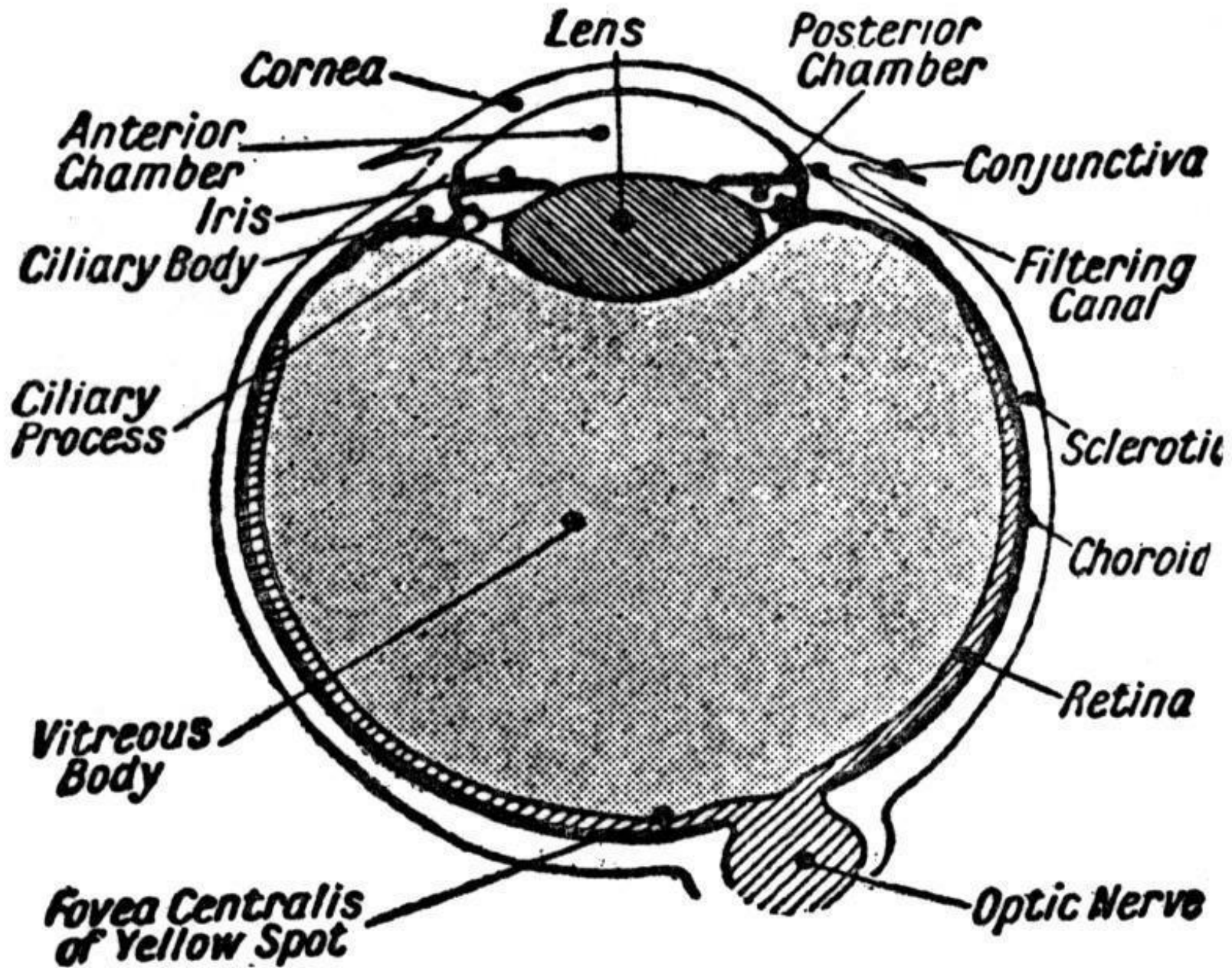
Anterior chamber (between cornea and iris).

Posterior chamber (between iris, zonule fibers and lens) The two chambers are filled with *aqueous humor*. Which is a fluid secreted by the secretory processes of the ciliary body in the posterior chamber then its pathway through the pupil to the anterior chamber to be drained via the trabecular meshwork in the iridocorneal angle to the systemic circulation.

The posterior segment (between the lens and the retina). It is filled with a more viscous fluid, the *vitreous humor*.

The sagittal section of the eye also reveals **the lens** which is a transparent body located behind the iris.

The lens is suspended by ligaments (called zonule fibers) attached to the anterior portion of the ciliary body. The contraction or relaxation of these ligaments as a consequence of ciliary muscle actions, changes the shape of the lens, a process called **accommodation** that allows us to form a sharp image on the retina.



Light rays are focused through the transparent cornea and lens upon the retina. The central point for image focus (the visual axis) in the human retina is the **fovea**. Here a maximally focused image initiates resolution of the finest detail and direct transmission of that detail to the brain for the higher operations needed for perception. Slightly more nasally than the visual axis is the optic axis projecting closer to the optic nerve head. The optic (anatomical) axis is the longest sagittal distance between the front or vertex of the cornea and the furthest posterior part of the eyeball. It is about the optic axis that the eye is rotated by the eye muscles.

Blood supply of the eyeball:

The ophthalmic branch of internal carotid artery.

The inner two thirds of the retina supplied by the central retinal artery a branch of the ophthalmic artery

The venous drainage via the central retinal vein, then to the ophthalmic veins and cavernous sinus.

The outer 1/3 take its blood supply from the choroid.

The blood supply of the uveal tract is via the short and long posterior ciliary arteries, and anterior ciliary arteries (branches of the ophthalmic artery).

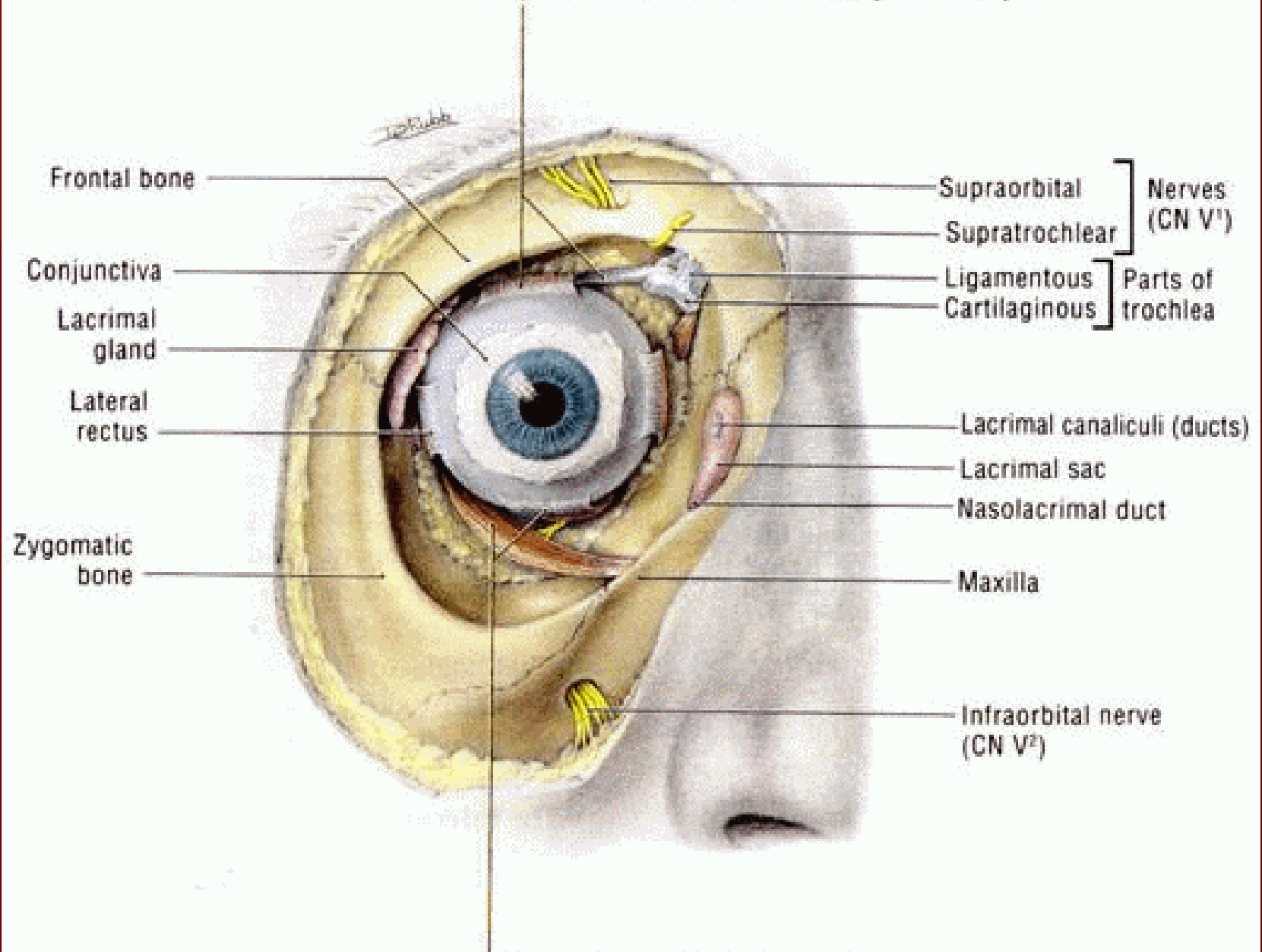
Nerve supply of the eyeball:

sensory supply from the ophthalmic division of the trigeminal nerve, via the nasociliary branch.

parasympathetic supply via the oculomotor nerve nuclei to the iris constrictor muscle and ciliary muscles.

Sympathetic supply through the superior cervical ganglion via the internal carotid artery plexus to the ocular vasculature and iris dilator muscle.

Superior rectus and tendon of superior oblique



Frontal bone

Conjunctiva

Lacrimal gland

Lateral rectus

Zygomatic bone

Supraorbital

Supratrochlear

Ligamentous
Cartilagenous

Nerves
(CN V¹)

Parts of
trochlea

Lacrimal canaliculi (ducts)

Lacrimal sac

Nasolacrimal duct

Maxilla

Infraorbital nerve
(CN V²)

Inferior oblique and inferior rectus

The extraocular muscles of the eyeball include:

1. Superior rectus,
2. Medial rectus.
3. Inferior rectus.
4. Lateral rectus.
5. Superior oblique.
6. Inferior oblique.

All of them nerve supply by the oculomotor nerve except the superior oblique by the trochlear nerve, and the lateral rectus by the abducent nerve.

Accommodation is the ability of the eye to change its optical power to maintain clear image for different distances

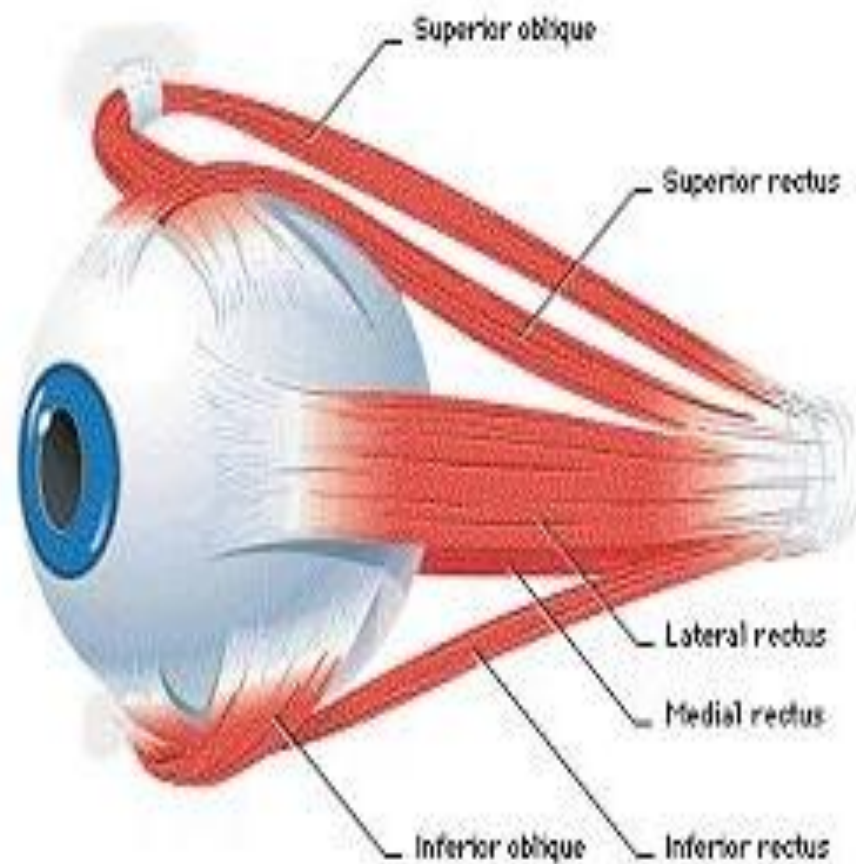
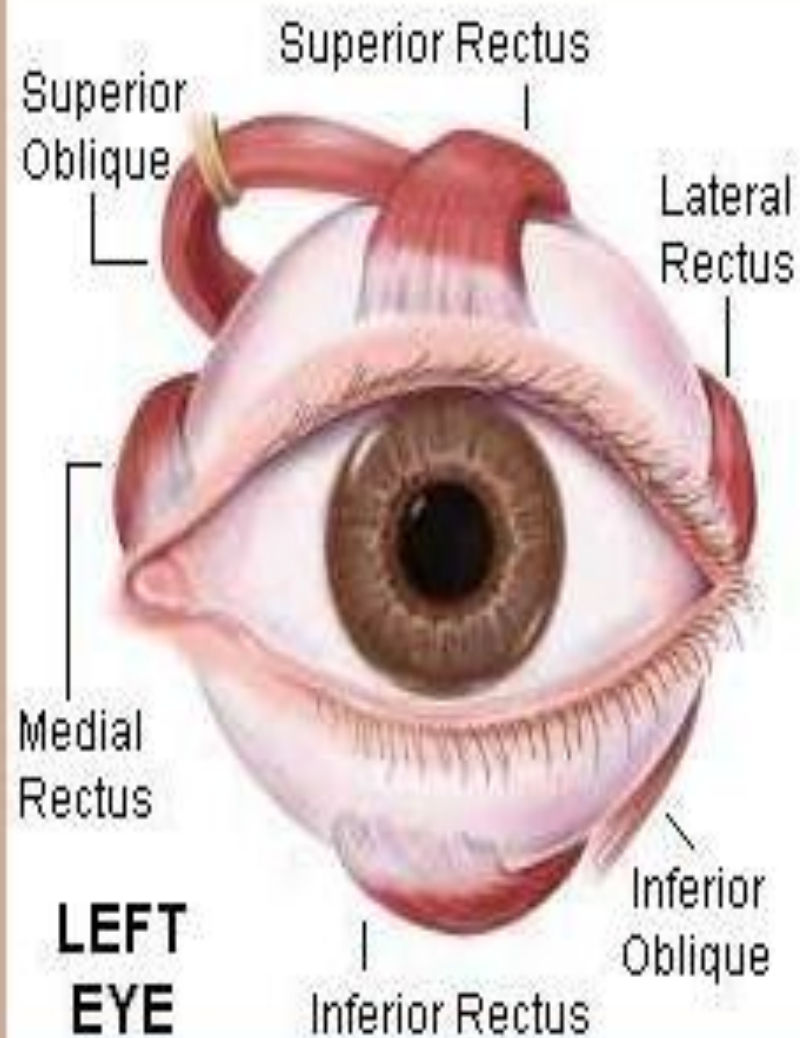
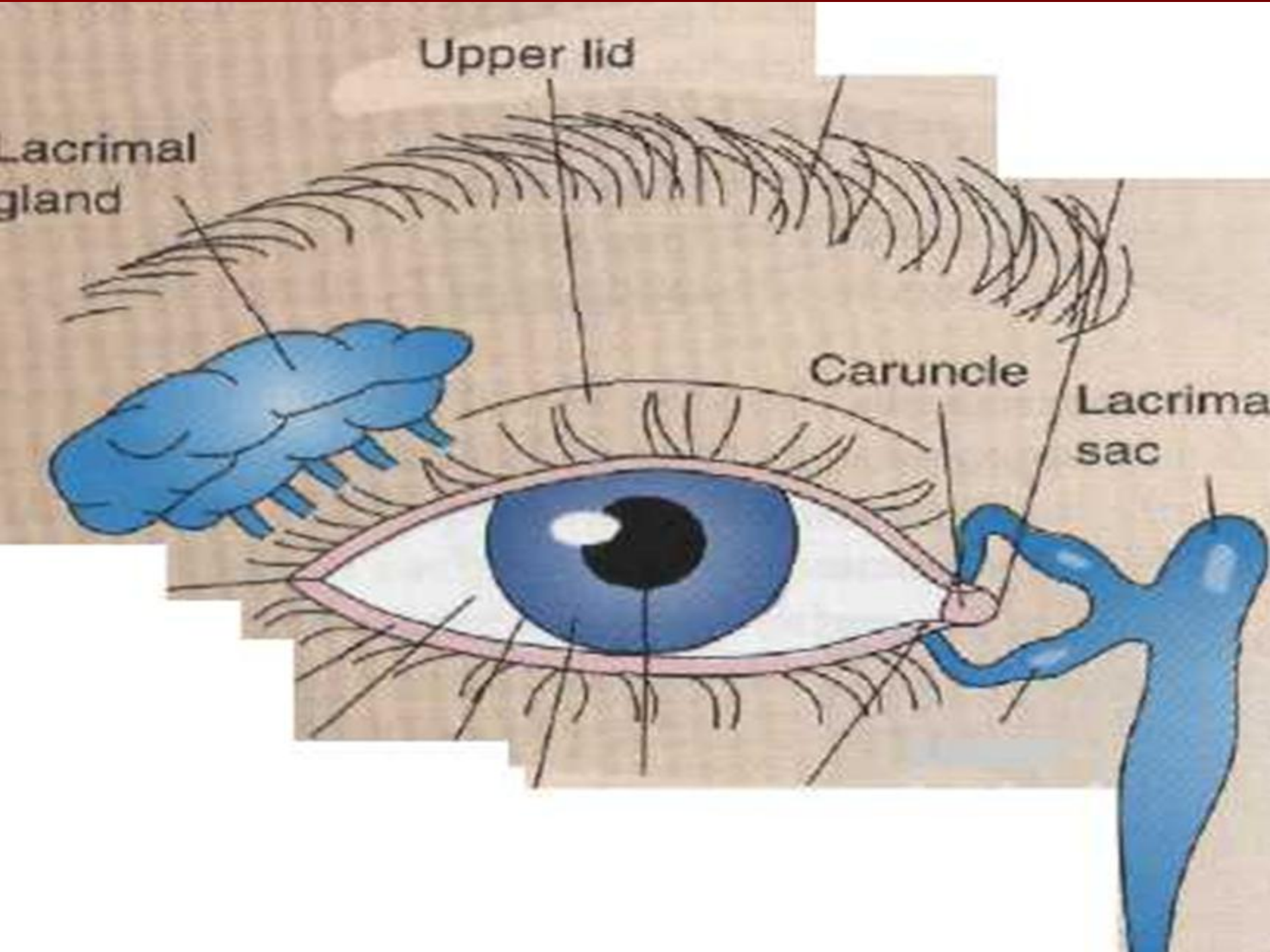
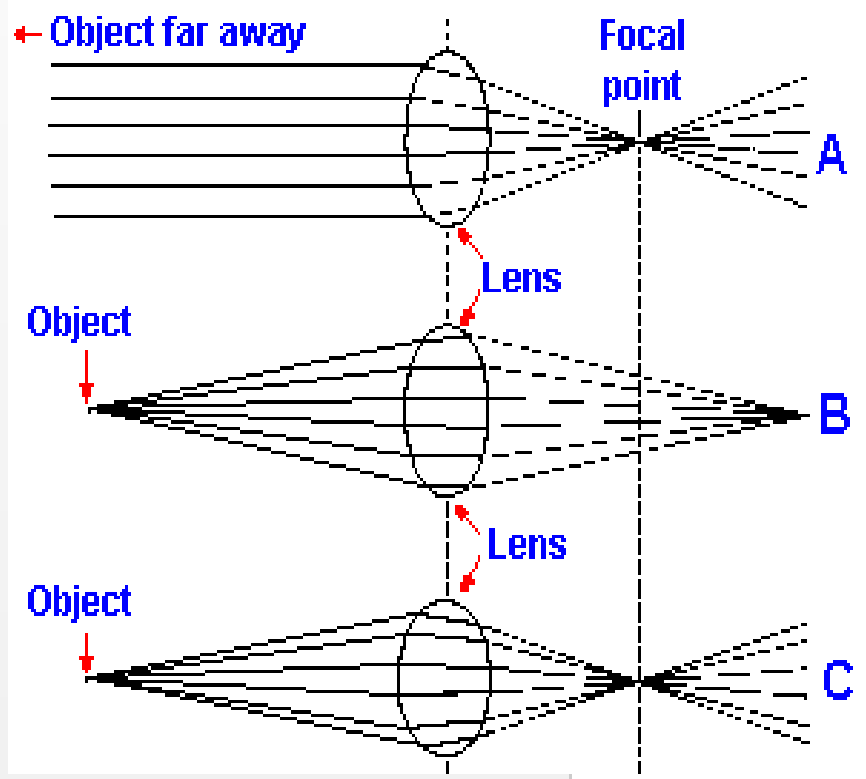
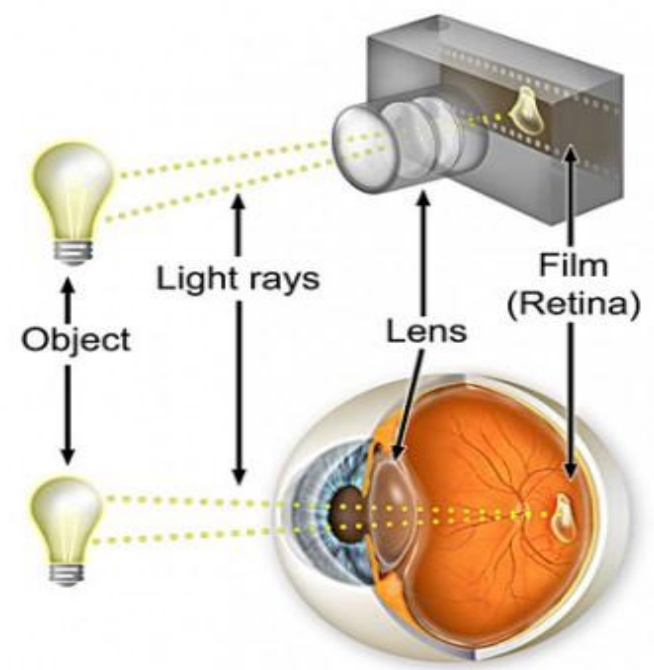


Figure 2a. Frontal view of the eye and attached muscles (left).

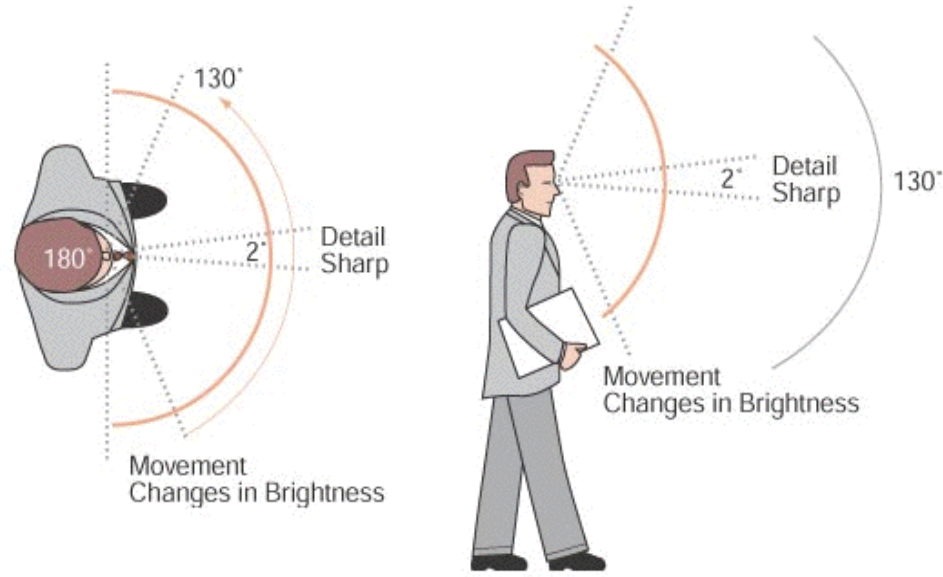
Figure 2b. Isometric side view of the eye and attached muscles (right).



How does the eye work?..... Camera v.s. the human eye



Accommodation





Thank you

