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Anatomy of the eye

7th Lecture : **Function of conjunctiva and eye ball -Parts of eye ball -Function of sclera**

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Function of each layer of the eye

-Function of conjunctiva and eye ball The conjunctiva and the eyeball play crucial roles in maintaining the health of the eye and enabling visual function.

Conjunctiva

1. Definition and Location:

•The conjunctiva is a thin, transparent membrane that covers the anterior surface of the eyeball and lines the inner surface of the eyelids.

2. Functions of the Conjunctiva:

a. Protection:

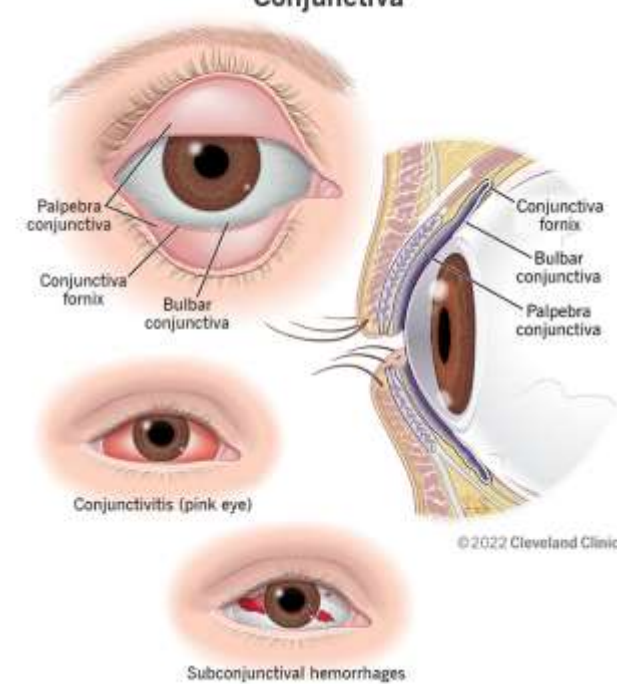
- The conjunctiva acts as a protective barrier, shielding the delicate structures of the eye from foreign particles, microorganisms, and irritants.
- It helps prevent the entry of dust, debris, and infectious agents, reducing the risk of eye infections
- and maintaining overall eye health.

b. Lubrication:

- The conjunctiva produces mucus and tears, which help lubricate the surface of the eye.
- This lubrication process ensures that the eye remains moist, preventing dryness and discomfort.
- Tears also contain enzymes and antibodies that provide additional protection against infections.

c. Immune Defense:

- The conjunctiva contains specialized immune cells, including lymphocytes and antibodies, which play a crucial role in the eye's immune defense system.
- These immune cells help identify and neutralize pathogens that may come into contact with the eye, reducing the risk of infections.



Eyeball

1. Definition and Components:

- The eyeball refers to the globe-shaped structure of the eye, which contains various components responsible for vision.

2. Functions of the Eyeball:

a. Vision Formation:

- The eyeball, together with its components, is responsible for the formation of vision.
- Light enters the eye through the cornea and the lens, which focus the light onto the retina.

B-Retina and Photoreceptors:

- The retina, located at the back of the eyeball, contains specialized cells called photoreceptors.
- Photoreceptors, namely rods and cones, convert light into electrical signals that can be processed by the brain.

c. Choroid:

- The choroid is a highly vascular layer located between the retina and the outer sclera.
- It supplies oxygen and nutrients to the retina, supporting the metabolic needs of the photoreceptor cells.

d. Iris and Pupil:

- The iris, the colored part of the eye, controls the size of the pupil.
- By adjusting the size of the pupil, the iris regulates the amount of light entering the eye, ensuring optimal vision in different lighting conditions.
- The conjunctiva and the eyeball are two essential components of the eye, each serving distinct functions.
- The conjunctiva protects the eye, provides lubrication, and contributes to the immune defense system.
- The eyeball, consisting of the cornea, lens, retina, choroid, iris, and pupil, enables vision formation by focusing light onto the retina and converting it into electrical signals.

Parts of the Eyeball

Cornea

- The cornea is the transparent, dome-shaped outermost layer of the eyeball.
- It acts as a clear window, allowing light to enter the eye.

Function:

- The cornea is responsible for refracting or bending the incoming light rays.
- It is the primary structure that focuses light onto the lens.

Lens

- The lens is a transparent, flexible, and biconvex structure located behind the iris.

Function:

- The lens fine-tunes the focusing of light onto the retina.
- It adjusts its shape to allow for near and distant vision, a process known as accommodation.

Iris

- The iris is the colored part of the eye located between the cornea and the lens.
- It gives the eye its distinct color.

Function:

- The iris controls the size of the pupil, the central opening at the center of the iris.
- By adjusting the size of the pupil, the iris regulates the amount of light entering the eye.

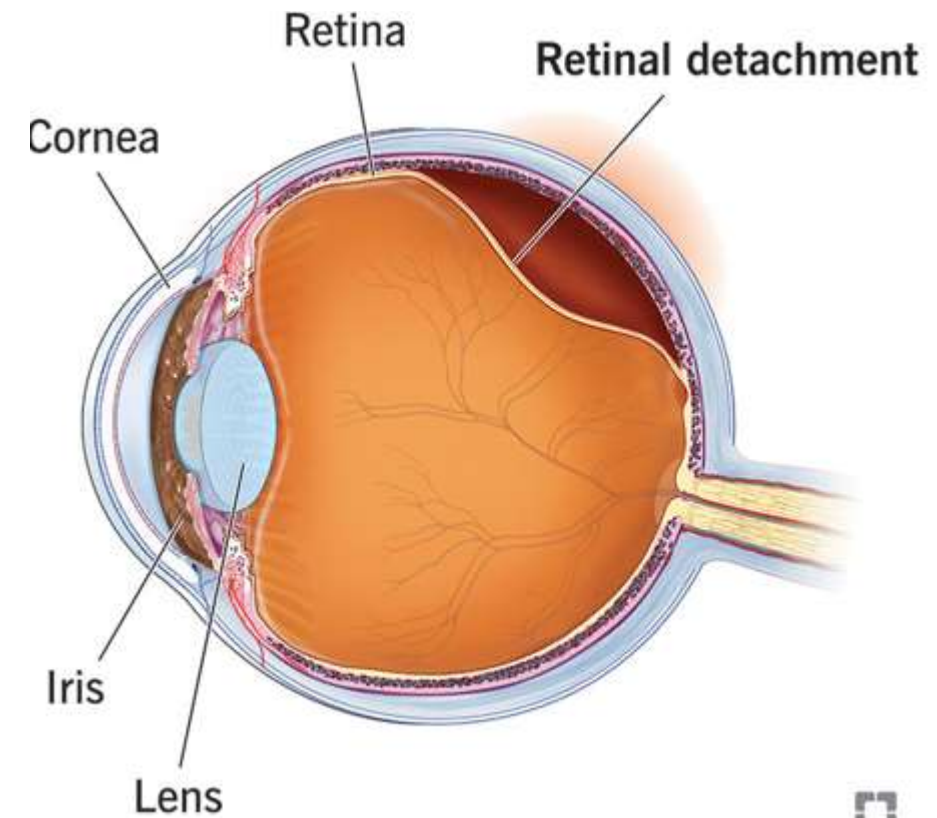
Retina

The retina is the innermost layer of the eyeball, lining the back of the eye*-Retina:

- Light-sensitive layer at the back of the eye containing millions of photoreceptor cells.
- Rods: Responsible for vision in low light and night vision.
- Cones: Responsible for color vision and sharp central vision.
- Converts light into electrical signals transmitted to the brain via the optic nerve.

Function:

- The retina contains specialized cells called photoreceptors that convert light into electrical signals.
- These signals are then transmitted to the brain via the optic nerve for visual processing.



Optic Nerve

- The optic nerve is a bundle of nerve fibers that carries visual information from the retina to the brain.

Function:

- The optic nerve transmits the electrical signals generated by the photoreceptors to the visual centers of the brain.
- This allows for the interpretation and perception of visual stimuli.

Choroid

- The choroid is a highly vascular layer situated between the retina and the sclera.

Function:

- The choroid supplies oxygen and nutrients to the retina, ensuring its proper function.
- It also helps remove waste products from the retina.

Slide 8:

Title: Sclera

- The sclera is the tough, white outer layer of the eyeball that covers most of its surface.

Function:

- The sclera provides structural support and protection to the internal structures of the eye.
- It helps maintain the shape of the eyeball and houses the attachment points for the extraocular muscles that control eye movements.

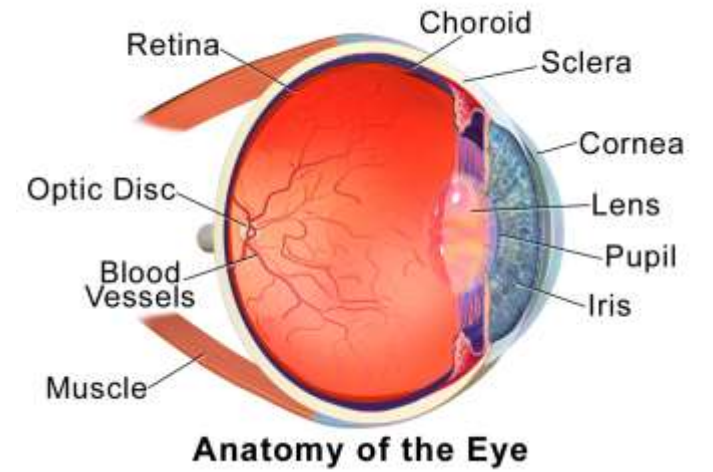
Summary

The eyeball consists of several important parts that work together to enable vision.

The cornea and lens focus light onto the retina, while the iris regulates the amount of light entering the eye.

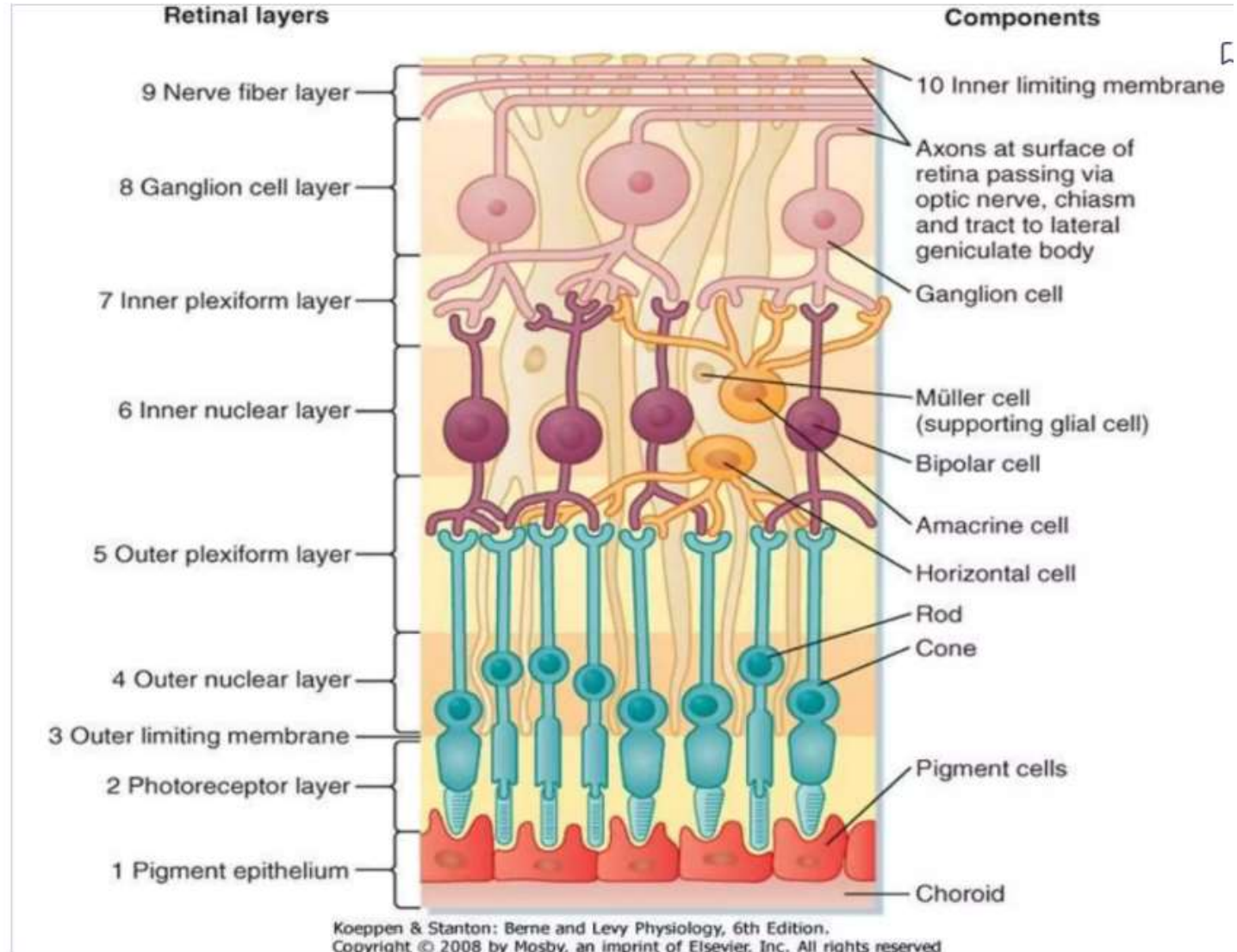
The retina contains photoreceptors that convert light into electrical signals, which are then transmitted to the brain via the optic nerve.

The choroid supplies nutrients to the retina, and the sclera provides structural support and protection.



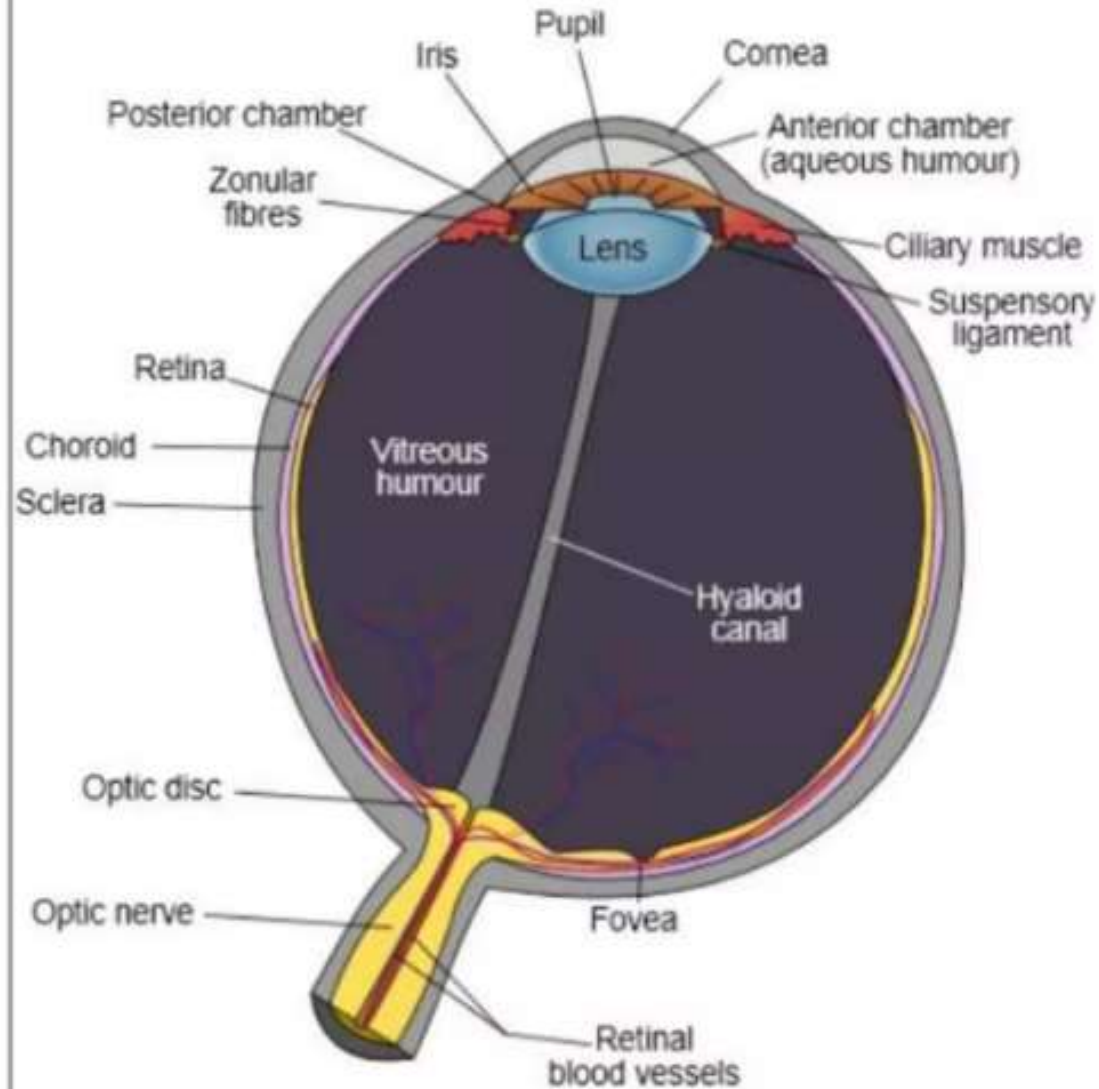
LAYERS OF RETINA

1. Retinal Pigmented Epithelium
2. Photoreceptors
3. Outer limiting membrane
4. Outer nuclear layer
5. Outer plexiform layer
6. Inner nuclear layer
7. Inner plexiform layer
8. Ganglion cell layer
9. Nerve fibers layer
10. Inner limiting membrane



Fovea Centralis (Central Fovea)

- A pit in the centre of the macula lutea
- Contains no rod cells
- Has high concentration of cone cells
- Recall: cones are associated with colour vision and perception of fine detail
- No blood vessels to interfere with vision
- Provides sharp detailed vision (e.g. needed during reading, driving etc.)



Function of the Sclera

- The sclera, also known as the white of the eye, plays a vital role in maintaining the structure and integrity of the eye.

Definition and Location

- The sclera is the tough, fibrous outer layer of the eyeball that covers most of its surface.
- It is composed of dense connective tissue and is opaque, giving it a white appearance.

Optic disc

- The optic disc is a point of retina from where all the optic nerve fibers are moving out of the retina through the lamina cribrosa and moving into the central nervous system as Optic nerve.
- The optic disc located slightly nasally superiorly and medially. There is also a depression in the optic disc called physiological cupping which is formed under certain disease condition like glaucoma.
- The optic disc is deprived of photoreceptors cells therefore it is termed as a blind spot .

Title: Functions of the Sclera

1. Structural Support:

- One of the primary functions of the sclera is to provide structural support to the eyeball.
- It forms the outer coat of the eye and maintains the shape and rigidity of the eyeball.
- The sclera acts as a protective layer, shielding the delicate internal structures of the eye, such as the retina, from external forces and injuries.

2. Attachment for Muscles:

- The sclera serves as an attachment site for the extraocular muscles, which control the movement of the eye.
- These muscles are responsible for the coordinated movements of the eye in different directions, allowing us to track objects and shift our gaze.

3. Protection:

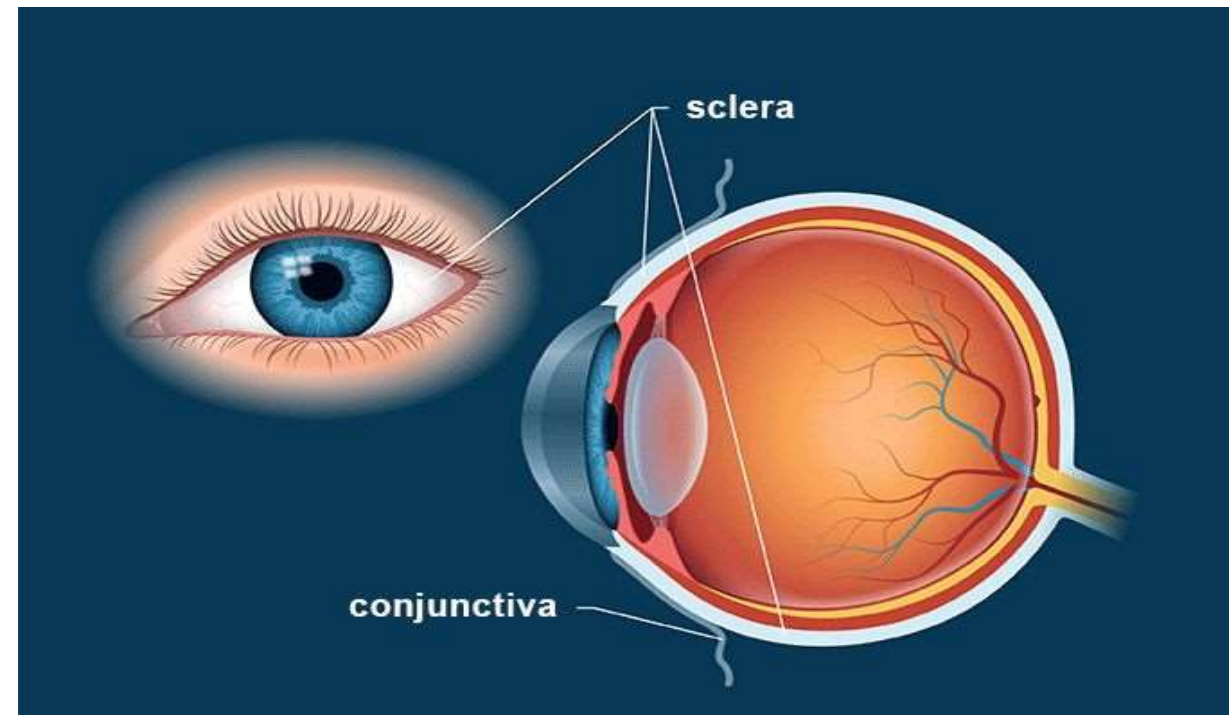
- The sclera acts as a physical barrier, protecting the internal structures of the eye from external pathogens, irritants, and injuries.
- It helps prevent the entry of foreign particles, microorganisms, and dust, reducing the risk of eye infections and damage.

4. Maintenance of Intraocular Pressure:

- The sclera plays a crucial role in maintaining the appropriate intraocular pressure within the eye.
- Intraocular pressure refers to the fluid pressure inside the eye, which is necessary for maintaining the shape and proper functioning of the eye.
- The sclera helps maintain the balance of fluid within the eye, ensuring that the pressure remains within the normal range.

The sclera, as the tough outer layer of the eyeball, performs several essential functions.

- It provides structural support, protects the internal structures of the eye, and serves as an attachment site for the extraocular muscles.
- Additionally, the sclera helps maintain the appropriate intraocular pressure within the eye.



Summary

The layers of the eye, including the conjunctiva, eyeball, and sclera, perform vital functions to ensure the overall health and function of the eye.

The conjunctiva protects the eye, provides lubrication, and contributes to immune defense.

The eyeball, consisting of various components such as the cornea, lens, retina, choroid, iris, and pupil, works together to focus light, convert it into electrical signals, and regulate the amount of light entering the eye.

The sclera provides structural support, protection, attachment for muscles, and helps maintain intraocular pressure.

**THANKS SEE YOU IN NEXT
LECTURE**