

Diploma in Pharmacy 1st Year

Human Anatomy & Physiology Practical

To study the given model of human eye.

Aim:

To study the given model of human eye.

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Dr. Sharma Rahul Kumar ,
“Practical Manual of Human Anatomy and Physiology” Published by Nirali
Prakashan , Pg.No 159 - 162

Theory :

The organ is used to sense light.

Three layers:

- 1) Outer layer consists of sclera and cornea
- 2) Middle layer consist of choroid, ciliary body and iris.
- 3) Inner layer consists of Retina

The primary component of the eye has the following functions

1. **Sclera or Scleroid Layer-White of Eye:** A thin layer of connective tissue that helps to keep the structure of the eye and offers a connection for the muscles that move it.
2. **Cornea:** It is clear dome-shaped portion of the sclera that covers the front of the eye and allows light to enter.
3. **Anterior Chamber:** It is a small chamber located between the cornea and the pupil.
4. **Aqueous Humour:** It is clear fluid that fills the anterior chamber of the eye and helps to maintain the shape of the cornea by supplying most of the nutrients to the lens and cornea and managing waste in front of the cyc.
5. **Chosoid Layer:** It is the middle layer of the eye, which contains with blood vessels.

6. **Ciliary Body:** The ciliary body is a linked circular band of muscles that sits just behind the iris and produces aqueous humour while changing the shape of the lens for focusing.
7. **Iris:** The blood vessels are contained in the pigmented front section of the choroid layers. It influences the colour of the eye and controls the quantity of light that enters the eye by adjusting the pupil size.
8. **Lens:** They are crystalline structure that focuses light onto the retina and is placed right beneath the iris.
9. **Pupil:** It is the opening in the centre of the iris. As the amount of light fluctuates, it grows in size.
10. **Vitreous:** The centre of the eye is filled with a thick, translucent liquid. It is largely made up of water and gives the eye its shape.
11. **Retina:** Retina is the sensory tissue that runs along the back of the eye. It has millions of photoreceptors (rod for black and white, cones for colour) that convert light rays into electrical impulses that are sent to the brain through the optic nerve.
12. **Optic Nerve:** They are the nerve that connects the retina to the brain and deliver electrical impulses.

Physiology of Vision (Sight)

- 1) The cornea and lens assist in the formation of the image on the retina.
- 2) When the image created by the lens reaches the retina, it is upside down and backwards.
- 3) The retina has two types of receptors:
 - i. **Rods:** There are 125 million rods present on a single retina. They are very sensitive to all wavelengths of visible light but do not form sharp images and are not able to distinguish their colour most dense in peripheral view - night time vision. Rods have a pigment called rhodopsin.
 - ii. **Cones:** There are 7 million cones present on a single retina. They mainly trigger central view and the colour becomes clear during daytime vision as the amount of light increases.
- 4) The three colours are distinguished by three types of cones:
 - i) Blue
 - ii) Red
 - iii) Yellow.

Fovea

- The centre of the eye's clearest vision and the region of the most colour perception is the point of central focus, which has a high density of cones.
- Light stimulates rods and cones and transmits vision-related impulses to the brain via the optic nerve.
- Due to a lack of receptors in this area, the optic nerve exits the eye just off centre near the Fovea, and is referred to as the blind spot.
- The optic chiasm, located just beneath the hypothalamus, connects the two optic nerves. This is an important aspect of vision and perception because it allows information from the right eye to cross over to the left side and vice versa.
- Both halves of the brain must process information from both eyes.
- The optic tract is where information leaves the chiasm.

- The organised optic tract emerges from the optic chiasm and enters the lateral geniculate nucleus.
- Information is divided in an organised manner, and sent to distinct areas of the visual cortex at the lateral geniculate nuclei.
- The different areas of visual cortex enroute different aspects of vision and information processing and as result an image is perceived.

Result: The given model of the human eye was studied.