

UNIT 9

SENSE ORGANS

Sense organs are highly specialized organs and are controlled by central nervous system. It is also known as receptors.

TYPES OF SENSORY RECEPTORS

No.	Receptors	Functions
1.	Chemoreceptors	Detect the presence of chemicals. Examples: taste and smell.
2.	Mechanoreceptors	Detect the mechanical forces. Example. Hearing.
3.	Nociceptor	Detects the damage or threat of damage to body tissues (Pain receptors).
4.	Thermoreceptors	Detects the changes in temperature. Examples: Heat and cold.
5.	Photoreceptor	Detects the light during vision.

TYPES OF SENSE ORGANS

- | | |
|---------------------------------|---|
| 1. Eye: Sight (seen) | 4. Tongue: Taste |
| 2. Ear: Hearing and Equilibrium | 5. Skin: Feeling for touch, pain, pressure and temperature. |
| 3. Nose: Smell | |

EYE

Eye is the hollow, spherical shaped photosensitive organ. It is also known as organ of sight. It is situated in the orbit of skull. The nerve supply for eye is done by optic nerve (II cranial nerve). Its diameter is about 2.5cm.

Structure of eye

The wall of eye is composed of three layers:

- Outer/Fibrous layer: It is formed by sclera and cornea.
- Middle/Vascular layer: It is formed by choroid, ciliary body and iris.
- Inner/Nervous layer: It is formed by retina.

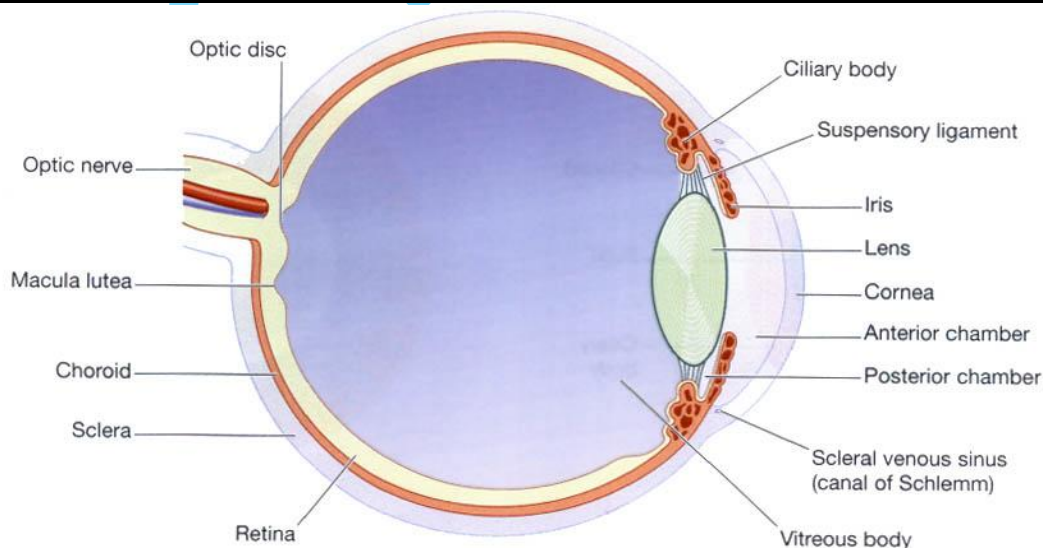


Fig. Structure of eye

TEAR

Tear is a watery, slightly alkaline and saline liquid secreted by the lacrimal glands.

Composition of tear

The tear is composed of:

- Water
- Salts
- Antibodies
- Lysozymes (antibacterial enzymes)

Functions of tear

1. It cleans the eyes.
2. It kills the pathogen.
3. It keeps the conjunctiva moist.
4. It provides nutrition to the conjunctiva.

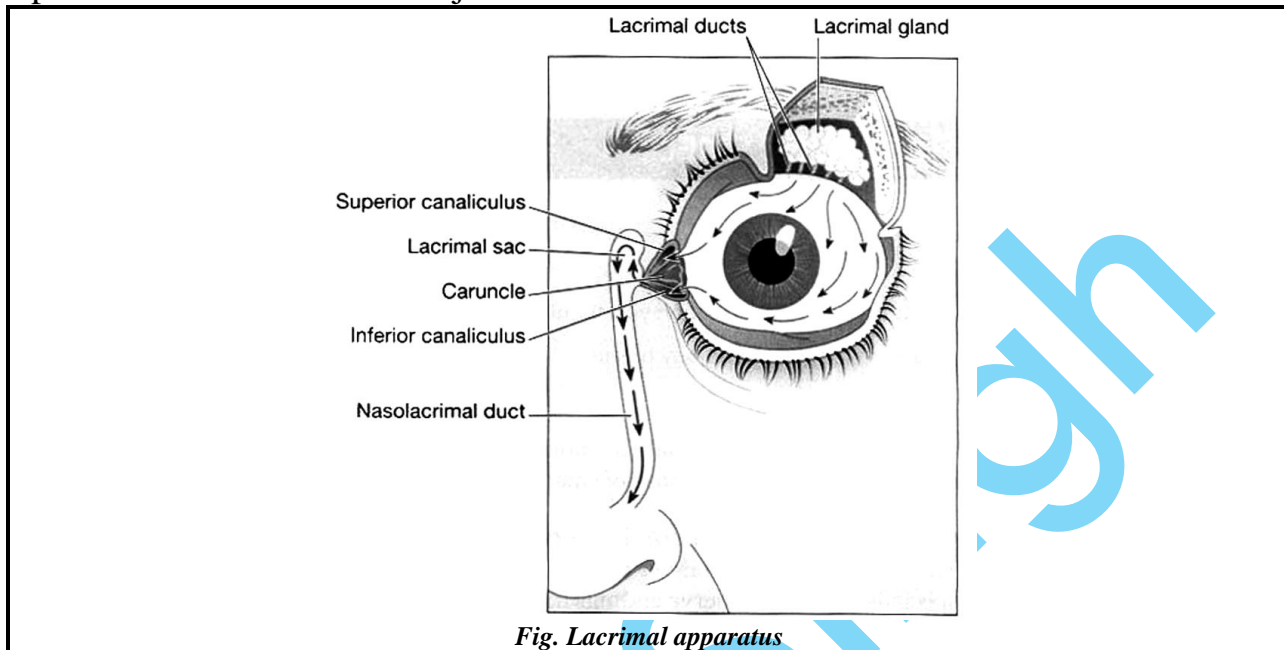


Fig. Lacrimal apparatus

VISUAL PATHWAY (PHYSIOLOGY OF VISION)

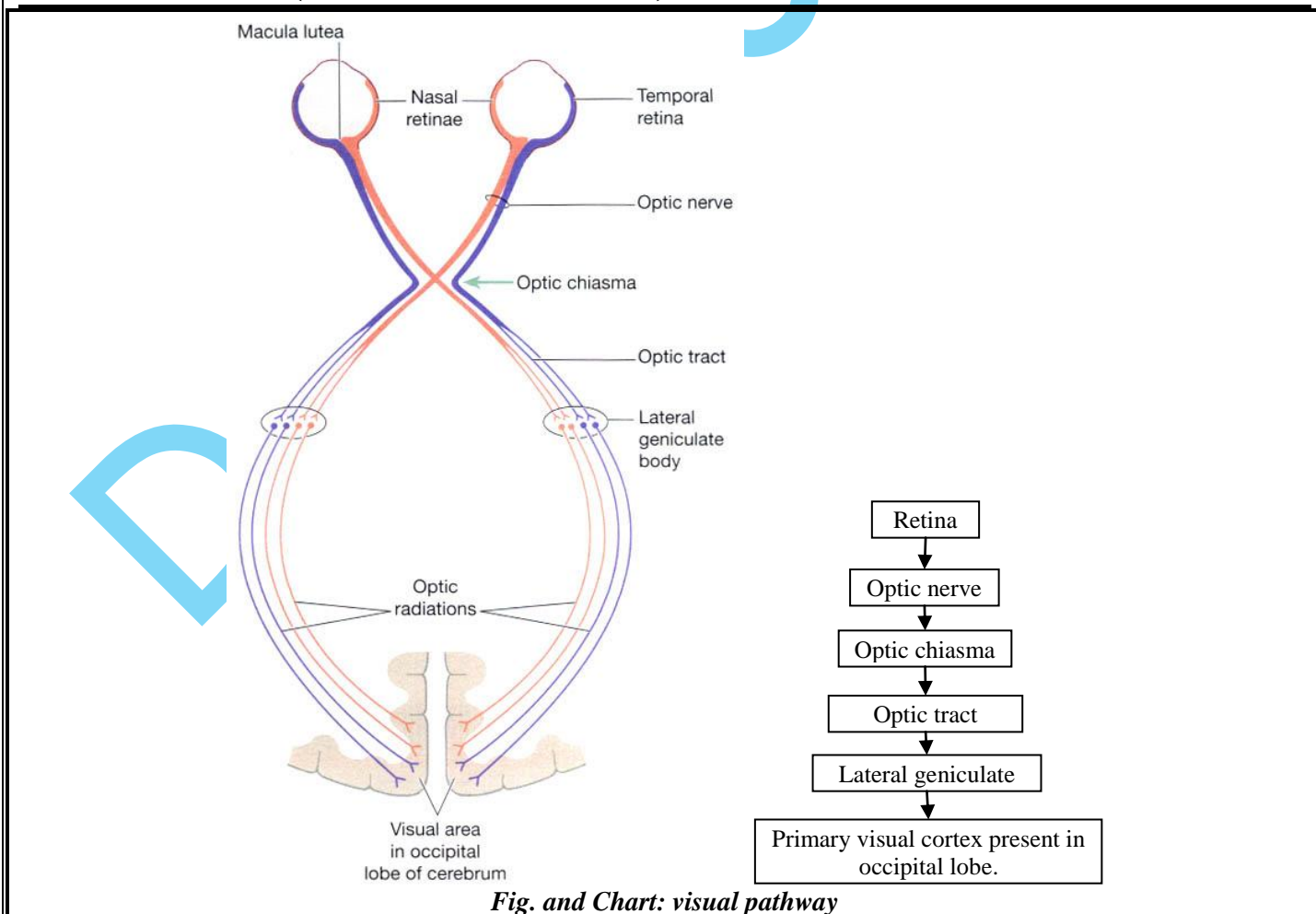


Fig. and Chart: visual pathway

ACCOMMODATION OF EYE

Accommodation is the adjustment of the eye to see either near or distant objects clearly.

EAR

Ear is concerned with the functions of hearing and maintaining equilibrium of the body. It is also known as phonoreceptor organ. It is supplied by the 8th cranial nerve (vestibulocochlear nerve).

STRUCTURE OF EAR

Ear is divided into three parts:

1. **External ear:** It consists of:
 - a. Auricle (Pinna)
 - b. External acoustic meatus (auditory canal)
2. **Middle ear:** It consists of:
 - a. Tympanic membrane
 - b. Tympanic cavity
3. **Inner ear:** It consists of:
 - a. Bony labyrinth
 - b. Membranous labyrinth

MECHANISM OF HEARING

- Sound waves in air are collected by pinna.
- The external auditory meatus directs these waves to the tympanic membrane which then vibrates.
- The vibrations are transmitted by malleus, incus and stapes to the membrane covering fenestra ovalis.
- From the inner surface of this membrane, vibrations are transmitted to organ of corti through perilymph and endolymph.
- From the organ of corti, the impulses (Produced by vibrations) are carried to brain stem through cochlear portion of 8th cranial nerves.
- The fibers are then carried to auditory centre of brain which is present in the temporal lobe of the opposite side.

Note: The normal hearing range in man 20Hz – 20 KHz.

ORGAN OF CORTI

The complex epithelial structure in the cochlea that contains thousands of hair cells rests on the internal surface of the basilar membrane and chief part of the ear by which sound waves are perceived and converted into nerve impulses to be transmitted to the brain is known as corti of ear.

AUDITORY OSSICLES

The small bones of the middle ear, which are articulate to form a chain for the transmission of sound from the tympanic membrane to the oval window is known as auditory ossicles. The bones of auditory ossicles are malleus, incus and stapes.

Functions of auditory ossicles

It increases the force but decrease the amplitude of the vibration transmitted from the membrane.