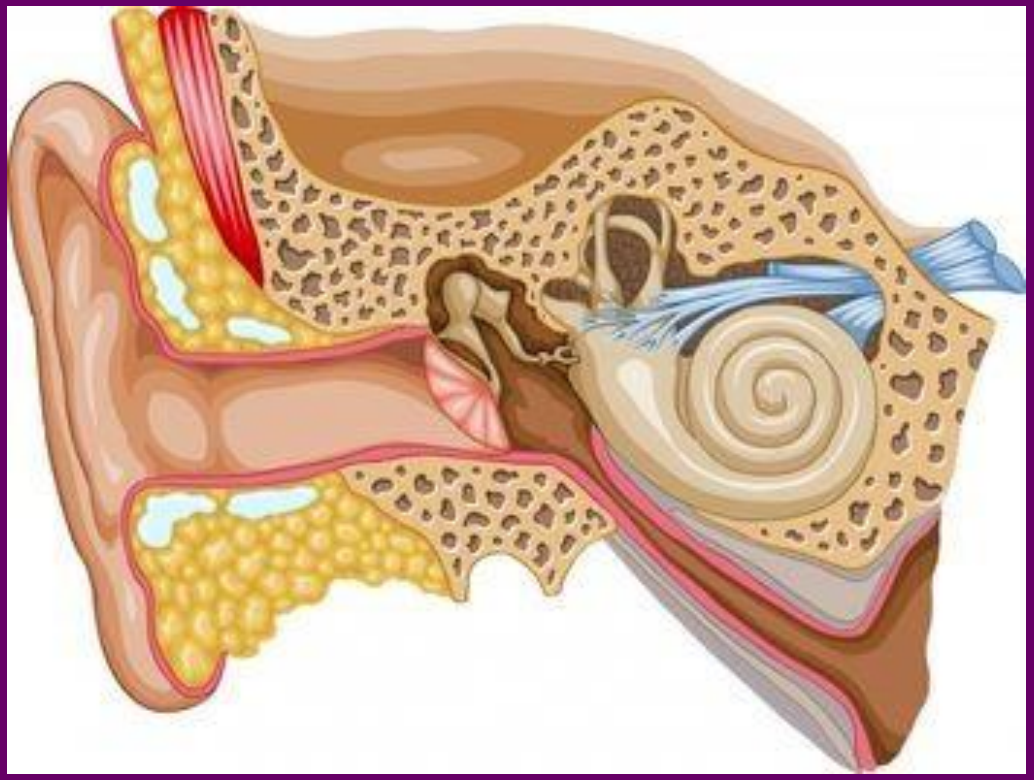
II. HEARING:

- the perception of sound and equilibrium
- takes place in the ears

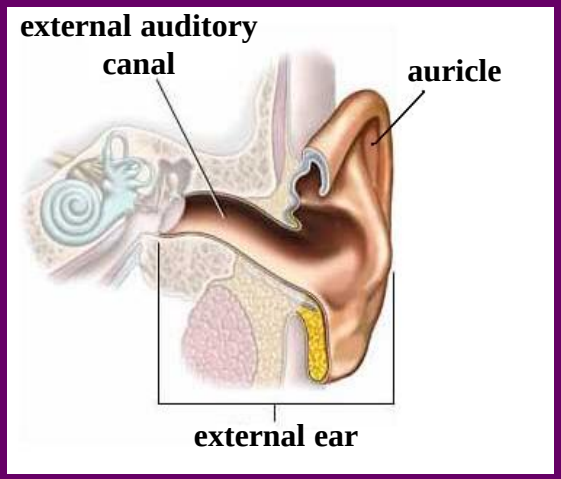


A. Anatomy of the Ear:

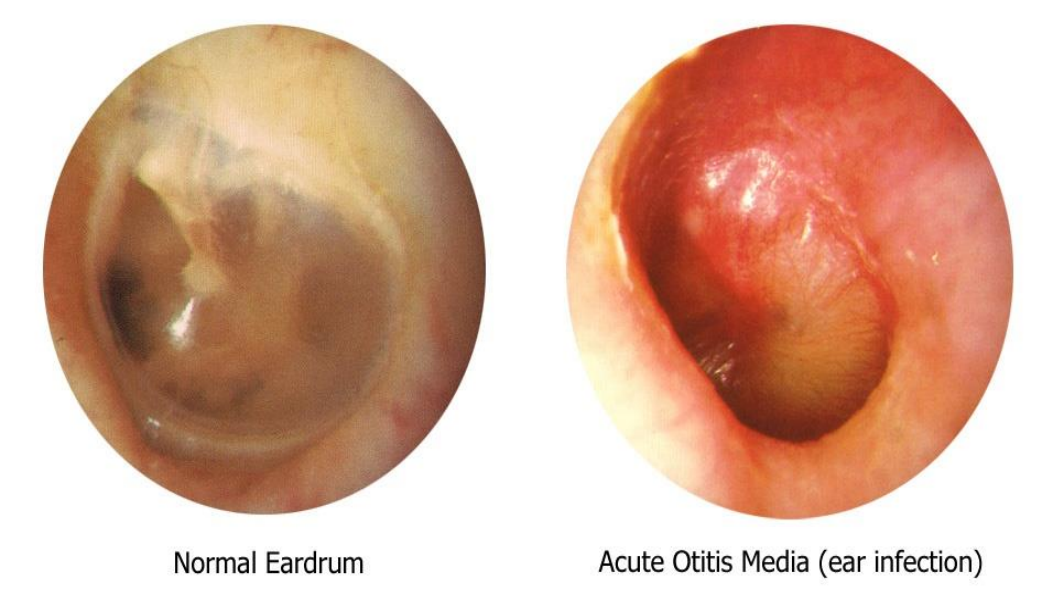
1. External Ear:

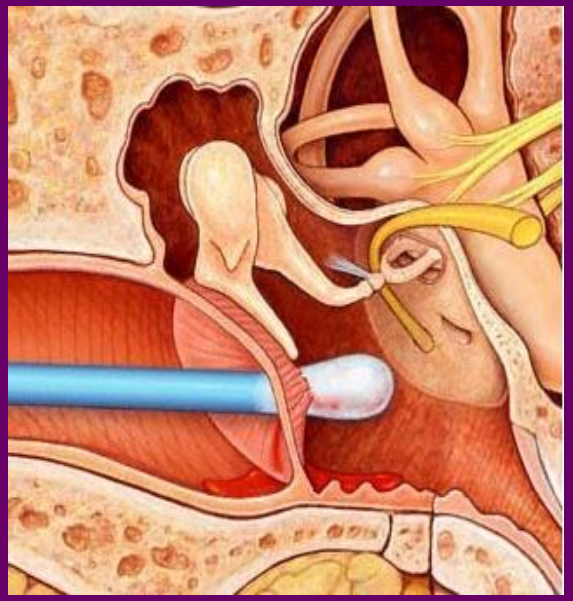
a. **Auricle** – funnels sound waves toward the inner ear (ear lobe)

b. **External auditory canal** – tube that extends through the temporal bone to the inner ear; lined with hair and ***cerumen*** (wax) to keep out foreign materials; opening is the ***external auditory meatus***



c. **Tympanic membrane** –sound waves bounce off this thin barrier, creating vibrations (ear drum)

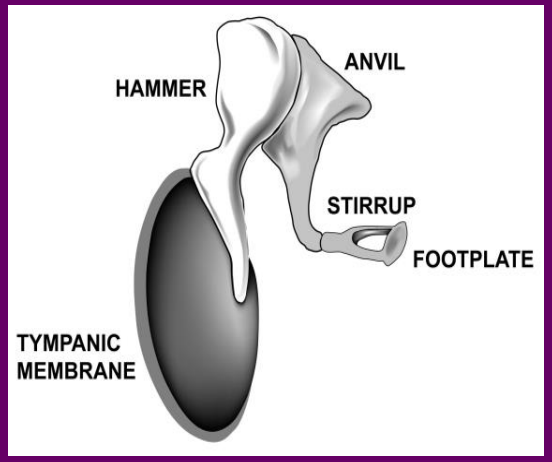




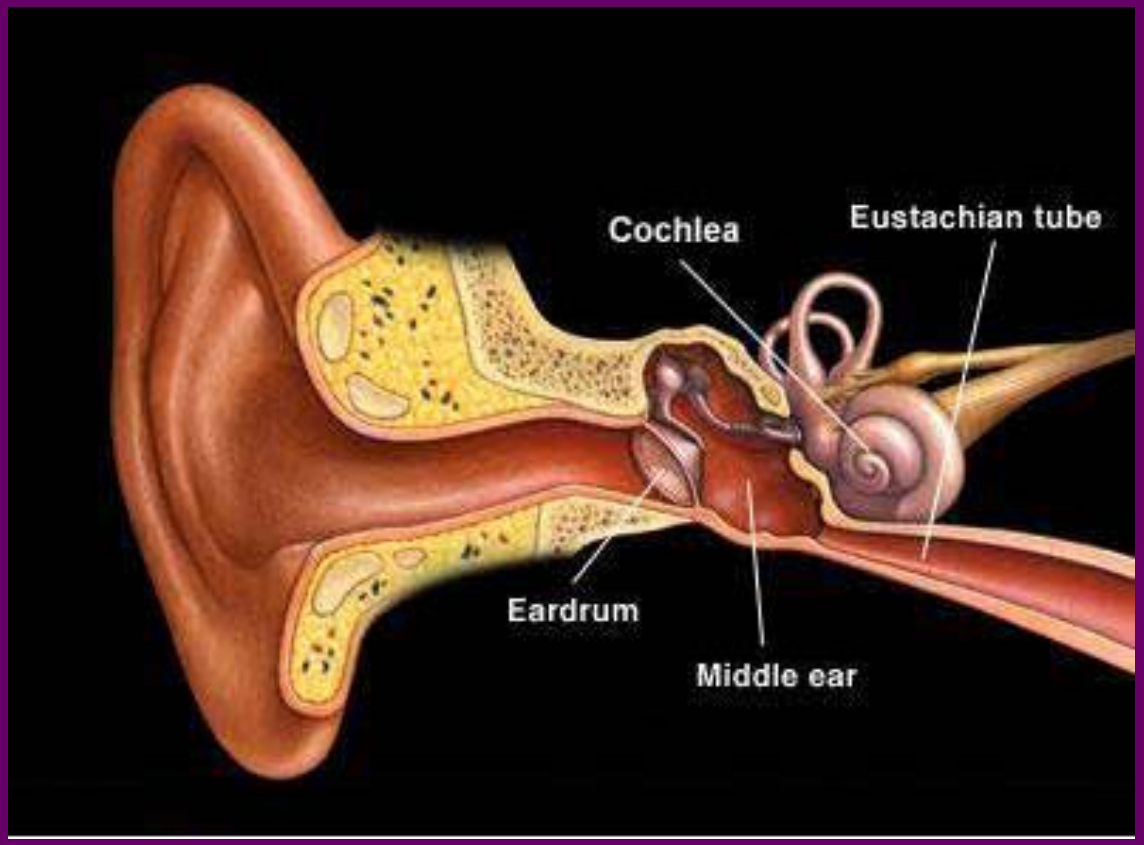
2. **Middle Ear:**

a. **Auditory Ossicles** – carry vibrations from the tympanic membrane; smallest bones in the body

- **malleus** – transfers vibrations from the tympanic membrane to incus
- **incus** – transfers vibrations to the stapes
- **stapes** – transfers vibrations to the inner ear



b. **Eustachian tube** – pathway that connects the middle ear to the pharynx; maintains air pressure on both sides of the tympanic membrane

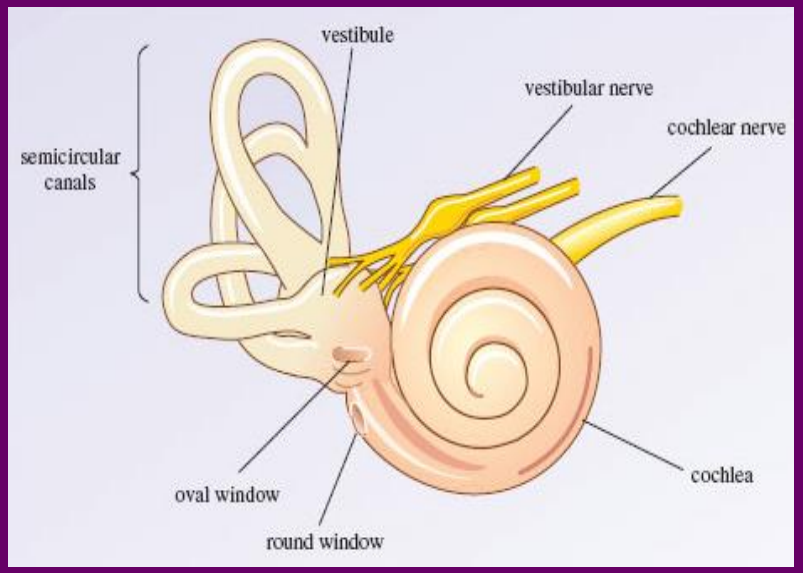


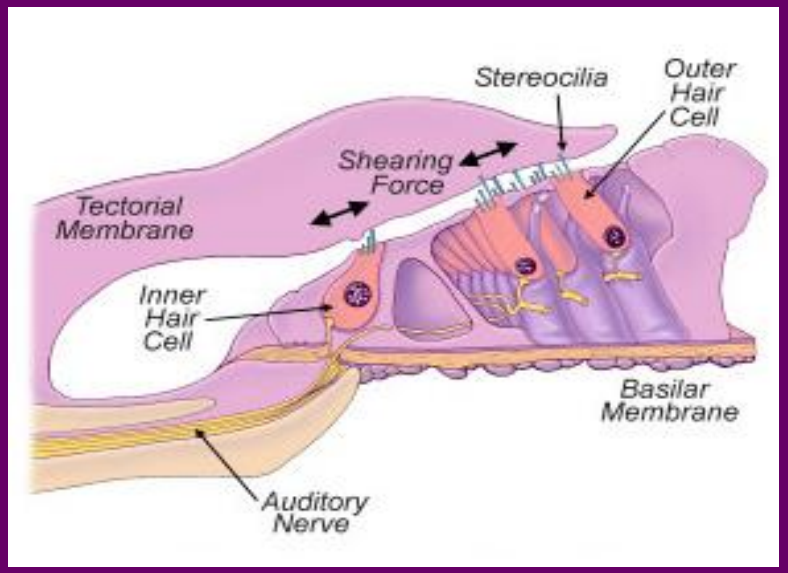
3. **Inner Ear (imbedded in the temporal bone):**

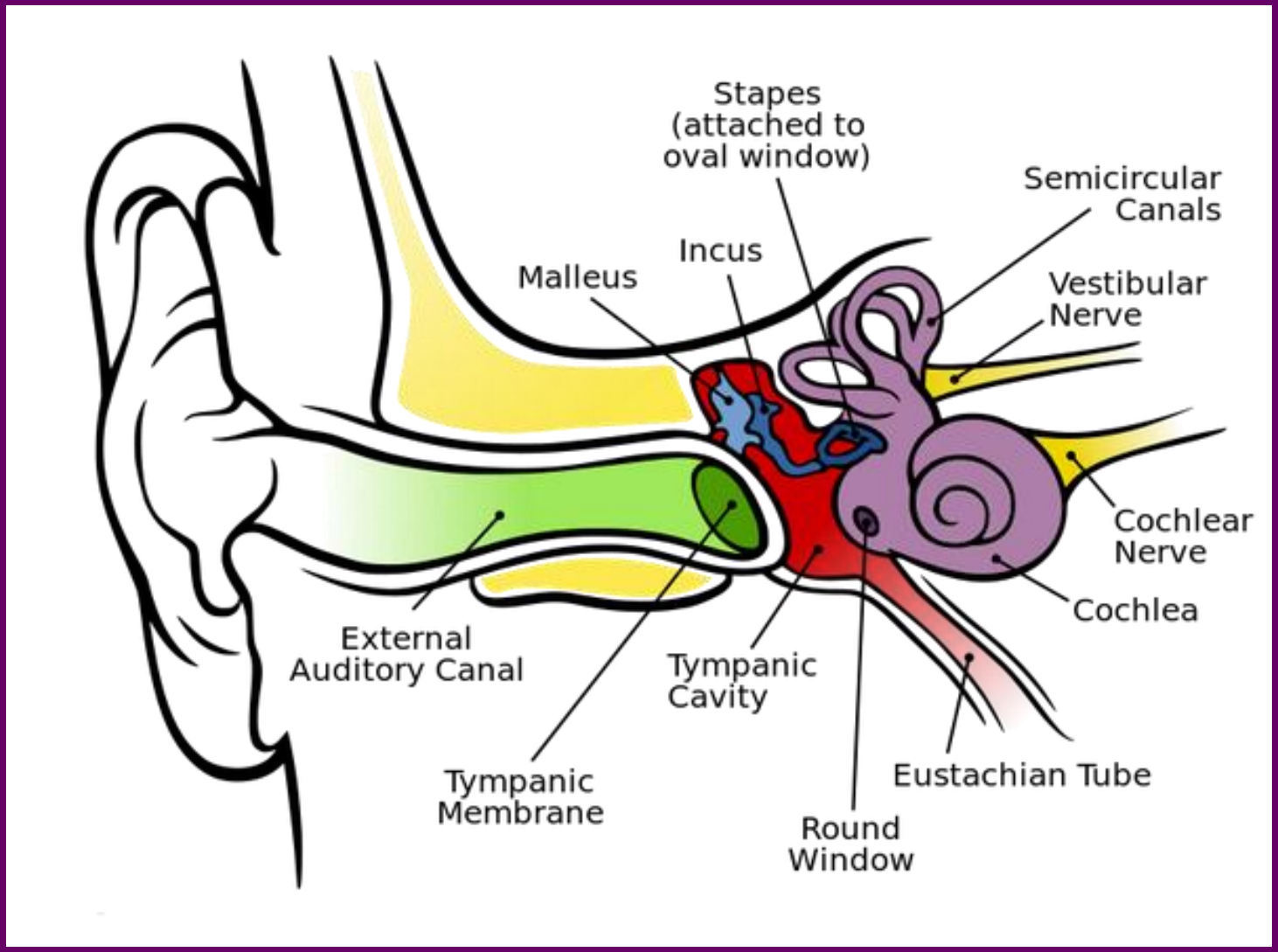
   a. **Vestibule** – the region between the semicircular loops and the cochlea (contains the ***oval window***)

   b. **Cochlea** – spiral structure that receives sound waves; contains the ***organ of Corti*** which converts sound vibrations into nerve impulses

   c. **Semicircular canals** – 3 fluid-filled loops that helps sense equilibrium/balance






Stapes
(attached to
oval window)
Semicircular
Canals
Incus
Malleus
Vestibular
Nerve
Cochlear
Nerve
Cochlea
External
Auditory Canal
Tympanic
Cavity
Tympanic
Membrane
Eustachian Tube
Round
Window

B. The Physiology of Hearing:

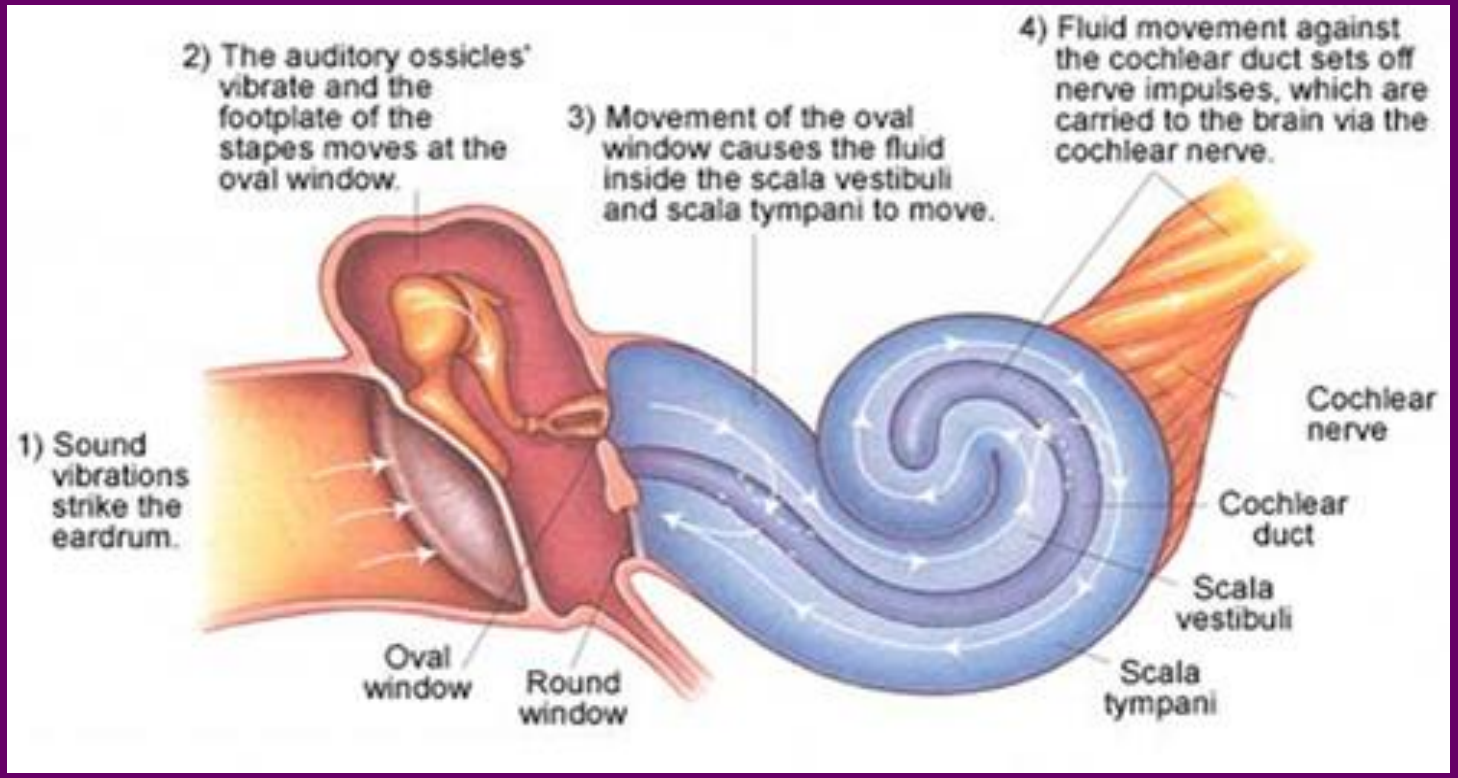
1. **auricle** funnels sound waves through the **external auditory meatus** into the **external auditory canal** which cause the **tympanic membrane** to vibrate

2. the vibrations move through the **auditory ossicles** (MIS)

3. movement of the stapes, which is connected to the **oval window** of the **vestibule** sends vibrations through the **cochlea**

4. the vibrations stimulate the **Organ of Corti** to send a nerve impulse **cochlear nerve** to the brain for processing

5. sound waves leave the cochlea and exit through the **eustachian tube**



CLICK HERE FOR A VIDEO ON HEARING