What are the Divisions of Ear Anatomy?

Worksheet

The ear has three divisions: the outer ear (pinna and ear canal) collects sound, the middle ear (eardrum and ossicles) amplifies it, and the inner ear (cochlea and vestibular system) converts vibrations into nerve signals and senses balance.

Questions

1. Which structure connects sound waves to vibration of the middle ear ossicles?

A) Cochlea
B) Eardrum (tympanic membrane)
C) Semicircular canals
D) Auditory nerve

2. Which ossicle attaches directly to the oval window?

A) Malleus
B) Incus
C) Stapes
D) Pinna

3. Balance sensation originates in which division of the ear?

A) Outer ear
B) Middle ear
C) Inner ear (vestibular system)
D) Eustachian tube

4. Fluid buildup in the middle ear typically causes what type of hearing loss?

A) Sensorineural
B) Conductive
C) Central
D) Mixed only

5. A patient has hearing loss after chronic ear infections with visible fluid behind the eardrum. Which division is affected and why does hearing worsen?

6. A patient reports vertigo and hearing loss together after a head injury. Which division is most likely involved?

7. Why does a ruptured eardrum cause temporary conductive hearing loss but usually heal without permanent damage?

8. Define: Name the three divisions of the ear.

9. Define: What structures are in the outer ear?

10. Define: What are the three ossicles?

Answer Key

1. B) Eardrum (tympanic membrane) - The eardrum vibrates from sound waves and transmits motion to the malleus.

2. C) Stapes - The stapes footplate sits in the oval window, transmitting vibration to the cochlea's fluid.

3. C) Inner ear (vestibular system) - The vestibular system - semicircular canals, utricle, saccule - is part of the inner ear.

4. B) Conductive - It impairs mechanical sound transmission through the ossicles - a conductive loss.

5. Fluid behind the eardrum indicates middle ear involvement (otitis media with effusion) The middle ear normally transmits vibration via an air-filled space and ossicles Fluid dampens ossicle movement, reducing sound transmission This causes conductive hearing loss, distinct from inner ear (sensorineural) loss

6. Vertigo points to vestibular system dysfunction Hearing loss points to cochlear dysfunction Both structures are housed in the inner ear (bony/membranous labyrinth) Combined symptoms suggest inner ear (labyrinthine) injury

7. The eardrum (tympanic membrane) separates outer and middle ear A rupture reduces its ability to vibrate efficiently, blunting sound transmission The eardrum has good blood supply and regenerative capacity Most perforations heal within weeks, restoring normal hearing

8. Outer ear, middle ear, and inner ear.

9. The pinna (auricle) and the external auditory canal, ending at the eardrum.

10. Malleus, incus, and stapes - the smallest bones in the body, in the middle ear.