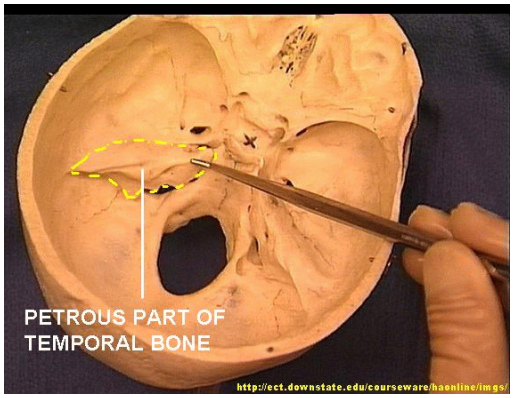
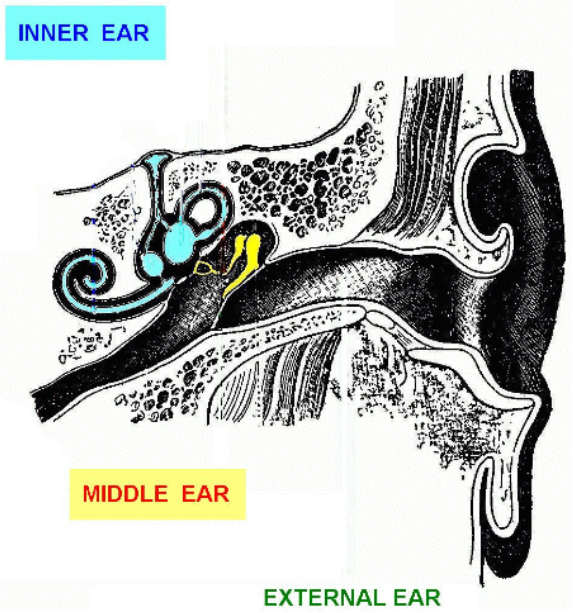
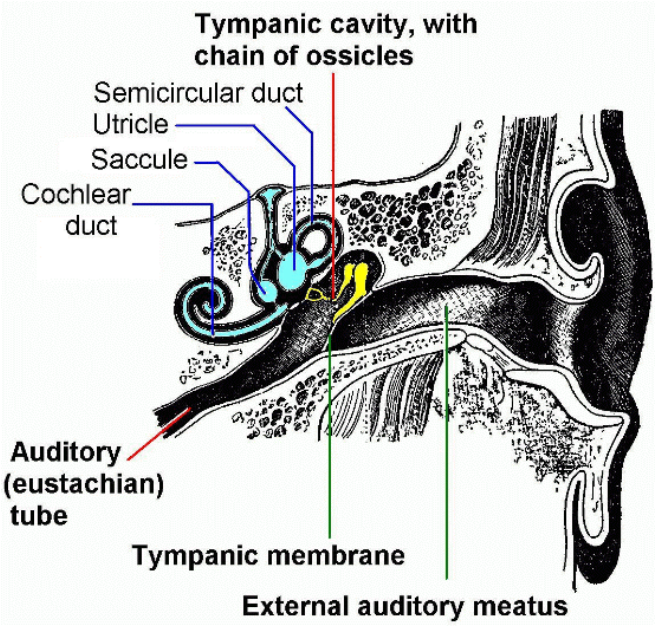
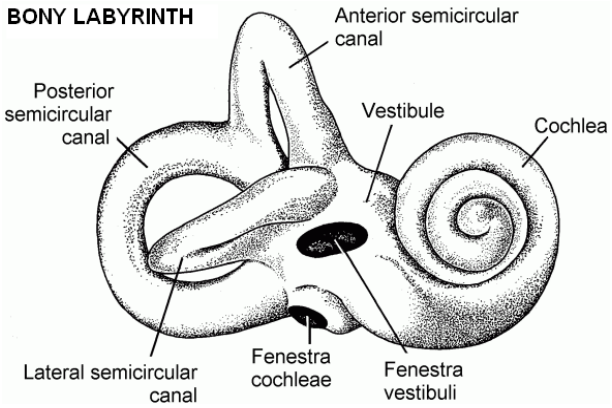
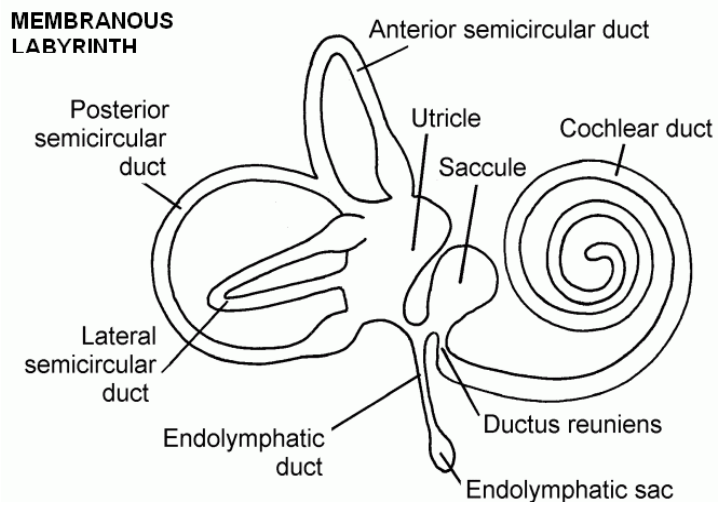
AUDITORY SYSTEM

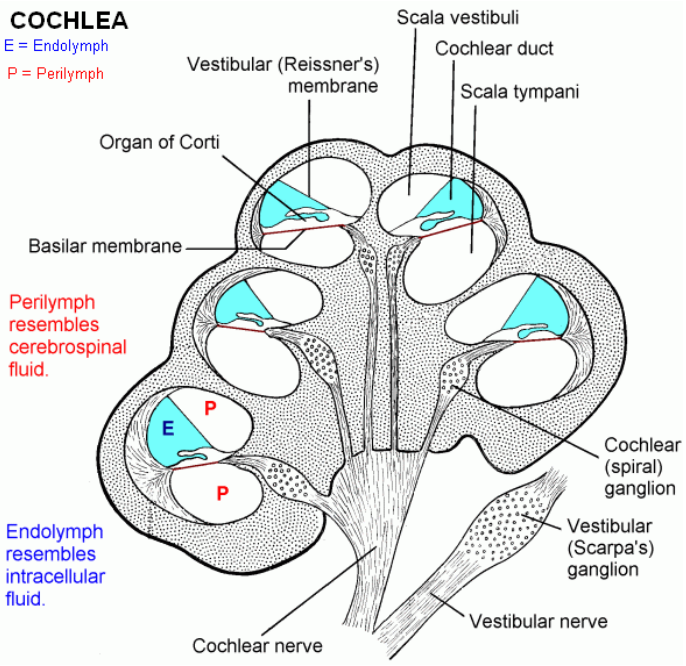


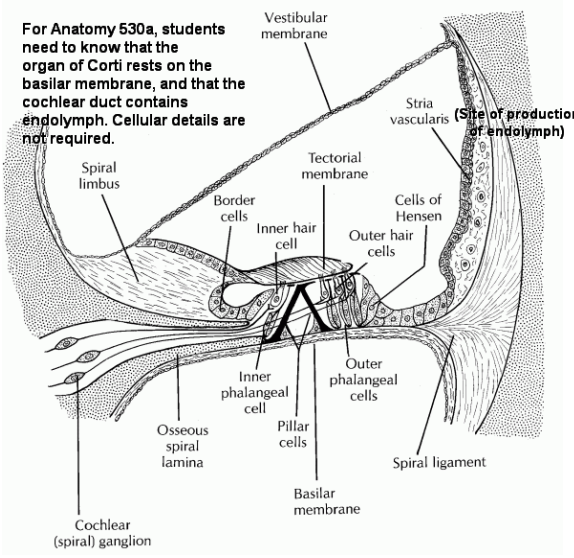












Sound = Compression waves

Can travel through air, liquid or solid

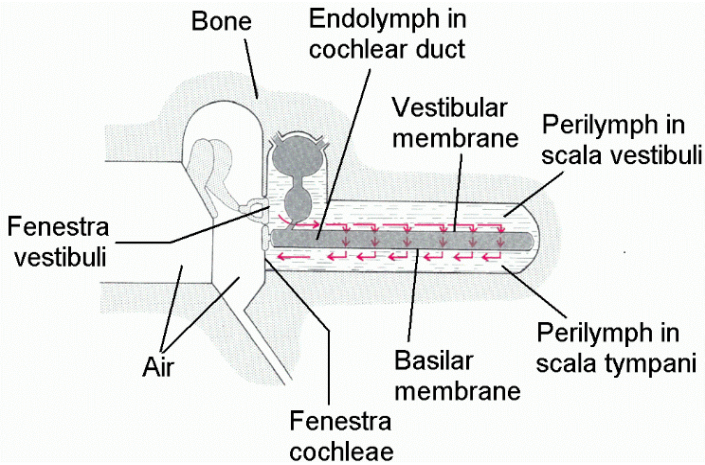
Compression waves in air make the tympanic membrane vibrate.

Ossicle chain amplifies force of vibration X15 from T.M. to fenestra vestibuli (oval window), where the sound is passed from the footplate of the stapes to the perilymph in the scala vestibuli.

Muscles (tensor tympani [V] and stapedius [VII]) protect against loud noise.

Vibration passes from perilymph in scala vestibulae, across vestibular membrane into endolymph of cochlear duct, ther across basilar membrane into perilymph of scala tympani.

Fenestra cochleae (round window is elastic membrane that separates the perilymph of the scala tympani from the air in the tympanic cavity.



The basilar membrane is narrowest at the base of the cochlea (near the stapes) and becomes progressively wider towards the apex of the cochlea.

Its taut collagen fibres vibrate (resonate) in response to sound.

The shorter fibres resonate with high frequencies; the longer fibres with lower (bass) frequencies.

1. **Tonotopic representation along the basilar membrane.**
2. **Noise causes high frequency deafness, because high pitches resonate nearest to the oval window.**

SUPERIOR OLIVARY NUCLEUS COMPARES TIMES OF ARRIVAL OF SOUNDS IN THE TWO EARS.

First step in binaural (stereophonic) hearing.

UNILATERAL LESIONS ABOVE THE LEVEL OF THE COCHLEAR NUCLEI DO NOT CAUSE UNILATERAL HEARING LOSS.

Cortical lesions can impair ability to localize sources of sounds.

Tonotopic representation throughout the system, from cochlea to cerebral cortex.