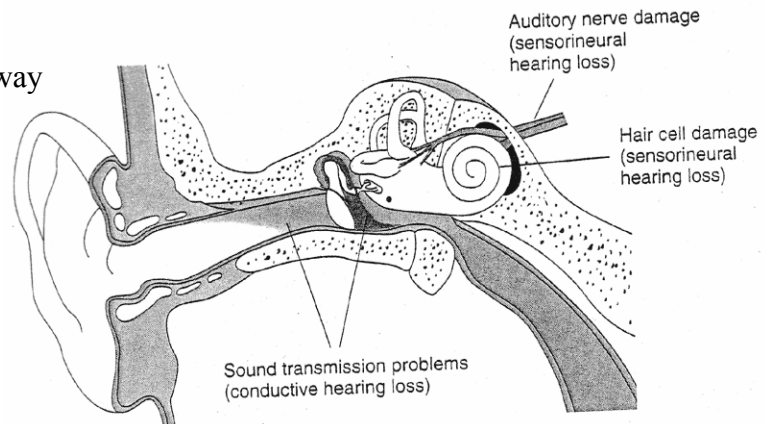


AUDITORY PATHOLOGY

Four types of problems in hearing:

- Delivery to sound receptors
- Damage to receptors
- Damage to neural transmission system/pathway
- Damage to auditory cortex



1. Conductive Hearing Loss

a) Outer-ear disorders

- i. Blockages
- ii. Malformations
- iii. Ruptured eardrum

b) Middle-ear disorders

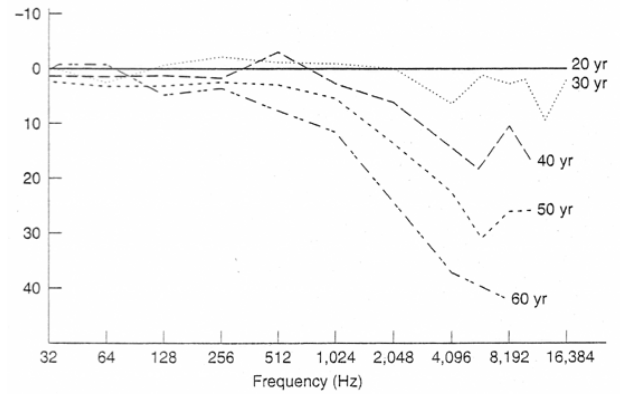
- i. Otitis media
 1. Cholesteatoma
- ii. Otosclerosis
 1. Stapedectomy

iii. Note: can still have bone conduction with these types of conductive hearing loss

2. Sensori-neural Hearing Loss

a) Presbycusis (“old hearing”)

- i. Loss of sensitivity
- ii. Greater loss at higher frequencies
- iii. Accompanies aging



b) Noise-induced hearing loss

- i. Refer back to permanent threshold shifts
- ii. Loud or continuous noises damage hair cells
- iii. Acoustic trauma

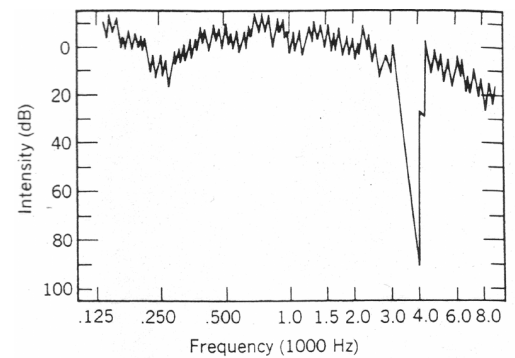


figure 12.23 Audiometric function generated by the Békésy tracking procedure. The curve shows threshold intensity as a function of frequency. The curve reveals a tonal gap—an insensitivity to a band of tonal frequencies—at about 4000 Hz.

c) Tinnitus

- i. (Latin for “tinkling”)
- ii. Chronic ringing in the ears
- iii. Affects ~36 million Americans!
- iv. Treatment...

d) Meniere's Disease

- i. Disease causes buildup of fluid inside the cochlea and semicircular canals
- ii. Results in fluctuating hearing loss, tinnitus, vertigo

e) Neural Hearing Loss

- i. Tumors or other damage to the auditory nerve or pathway
- ii. Tumors ("acoustic neuroma") often benign, can be removed

f) Drugs (antibiotics)

- i. e.g., streptomycin, gentamycin, neomycin, kanamycin
 1. Fast-acting, but predictable damage to the hair cells
- ii. e.g., aspirin, quinine, carbon monoxide, tobacco
 1. Note: smoking → greater rate of hearing loss

3. Neural Transmission & Cortex

a) Tumors

b) Lesions (damage)

c) Head trauma, meningitis, gunshot wounds

d) Note: auditory tract is quite deep, medial, so trauma-induced hearing loss usually accompanies other loss

4. Measuring Hearing Loss

- a) Audiologist
- b) Otorhinolaryngologist (ENT)
- c) Ear exam
- d) Medical history
- e) Audiogram
 - i. Pure tone
 - ii. Speech
 - iii. Threshold