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. Otis 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

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 \( \rightarrow \) 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