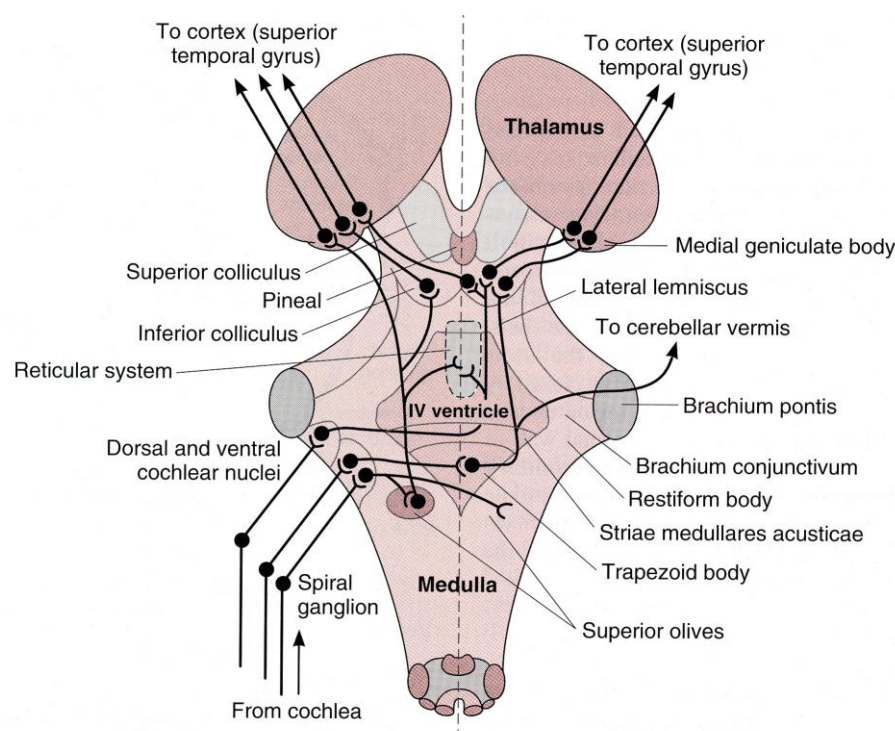


# Auditory Pathways

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Source of picture: William F. Ganong "LANGE Review of Medical Physiology", 21st ed. (2003); Publisher: McGraw-Hill / Appleton & Lange; ISBN-10: 0071402365; ISBN-13: 978-0071402361 >>

1. Organ of Corti - outer hair cells in organum spirale (cochlea)
2. Spiral (s. cochlear) ganglion in modiolus; cells use glutamate (+) and aspartate (+)
3. Cochlear part of CN8
  - o blood supply – labyrinthine artery
4. Cochlear Nuclei (anterior, posterior)
  - o blood supply – AICA
  - o have input from hypothalamus (histamine-containing fibers), locus ceruleus (noradrenergic projections), olive (olivocochlear projection uses enkephalin)
5. Trapezoid body – crossing fibers (acoustic striae); has also nuclei
6. Superior olive; cells use cholecystokinin
  - o blood supply – BA (long circumferential branches)
  - o **stapedius reflex!!!, spatial sound localization!!!**
  - o olivocochlear fibers – **modulate sensitivity of hair cells**
7. Lateral lemniscus; has nuclei that contain dynorphin
  - o blood supply – BA (long circumferential branches)
8. Inferior colliculus; major **feedback** to lower nuclei
  - o blood supply – BA&SCA (long circumferential branches)
  - o has input from locus ceruleus (noradrenergic projections)
9. Medial geniculate body - thalamic relay station; directs **auditory attention**
  - o blood supply – PCA (thalamogeniculate branches)
10. Temporal auditory cortex:
  - 1) primary auditory cortex (41-42)
  - 2) secondary auditory cortex (22)

Three categories of deafness:

**Conductive hearing loss** – external ear, middle ear (otitis media, otosclerosis).

- Weber lateralizes to affected side
- Rinne is negative (abnormal)

**Sensorineural hearing loss** – cochlea, cochlear part of CN8.

- Weber lateralizes to normal side
- Rinne is positive in mild cases (in severe cases, 512 Hz tuning fork is not heard at either position)
- tinnitus

**Central deafness** – cochlear nuclei, central connections, auditory cortex

- system (central to dorsal and ventral cochlear nuclei) is bilateral and multisynaptic – synapse and crossing (or re-crossing) occurs at several levels – central lesions rarely result in unilateral or bilateral hearing losses that can be detected  
exception - damage to trapezoid body
- **cochlear nuclei-primary auditory cortex**: diminished auditory acuity, decreased ability to hear certain tones, difficulty in precise space localization.
- **secondary auditory cortex**: difficulty in understanding / interpreting sounds (auditory agnosia).

BIBLIOGRAPHY for ch. "Otology" → follow this [LINK >>](#)