

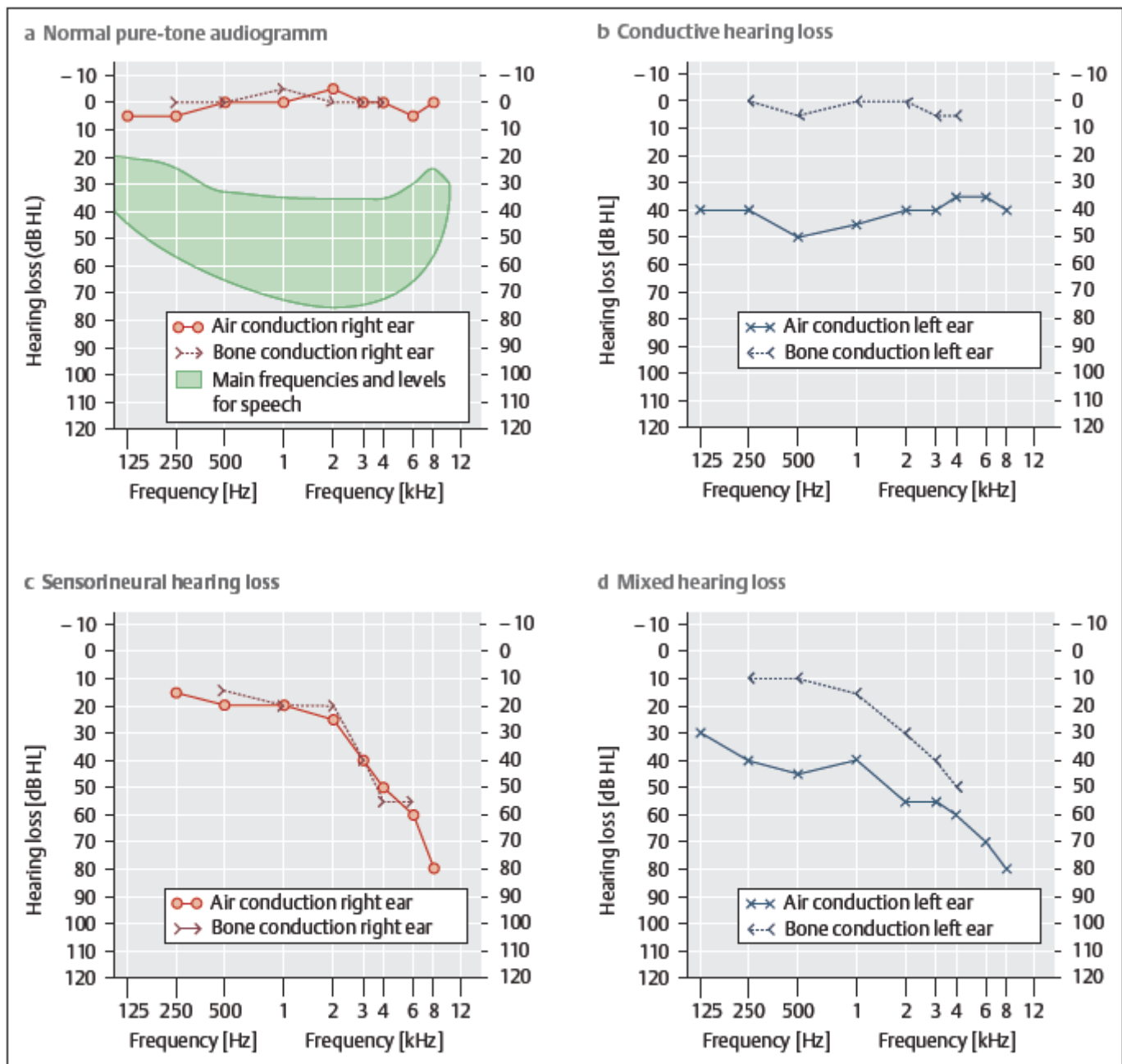
- žemesni garsai rezonuoja arčiau **APEX** (of cochlea).
- in general:

**sensorineural deafness** causes greater loss of *high-pitched sounds*\*

**conductive deafness** causes more loss of *low-pitched sounds*.

\*except Ménière disease – for *low-pitched sounds*

- limit **damaging noise** (< 85 dB / 8 h per day).
- **Noise-Induced Hearing Loss** - loss of **hair cells** in organ of Corti (i.e. sensory hearing loss); bilateral loss first occurs at **4 kHz**.
- **Presbycusis** - changes **from hair cells to auditory cortex**; first affects **highest frequencies** (18-20 kHz) - difficulty in SPEECH DISCRIMINATION- patients complain that others mumble.



## BAER

- **wave I** and early part of **wave II** - *auditory nerve* action potential.
- **wave II** - *cochlear nucleus*.
- **wave III** - *superior olive*.

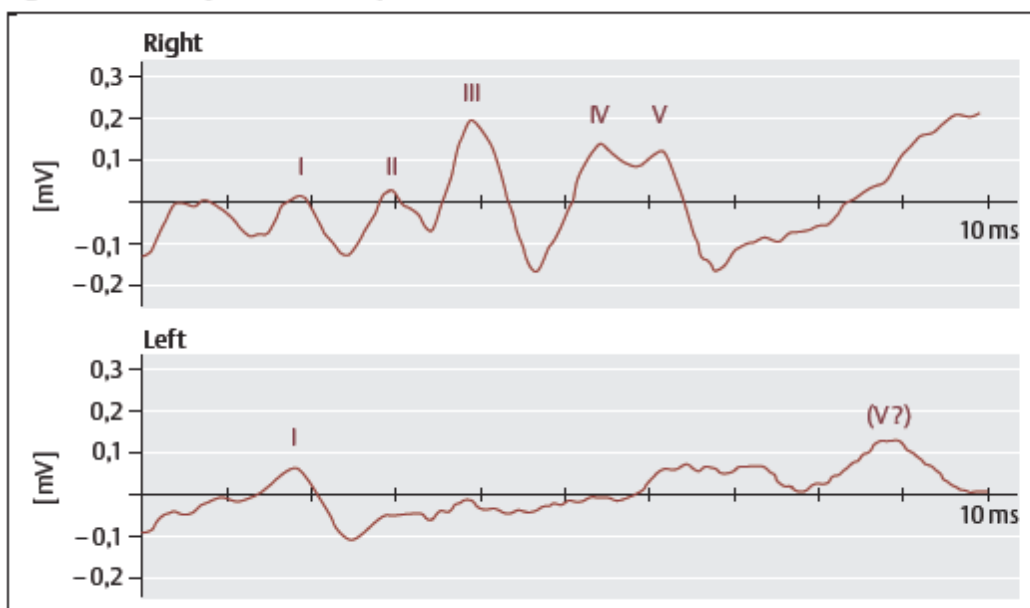
- wave IV - *lateral lemniscus*.\*
- wave V - *inferior colliculus*.
- waves VI and VII are inconsistent and of *uncertain origin* - little clinical utility.

N.B. most consistent are waves I, III, V (CN8, superior olive, inferior colliculus).

\*because **lateral lemniscus** contains *second order* neurons from cochlea and *third and fourth order* neurons from superior olive, it contributes to three waves.



Fig. Auditory brainstem response in retrocochlear disorders



Auditory evoked brainstem potentials in a patient with a left-sided retrocochlear hearing disorder. The *right side* shows normal ABR potentials with a normal latency. On the *left side*, only potential I is clearly defined. The potentials were evoked with a brief click stimulus approximately 90 dB above the hearing threshold.

**VERTIGO**

**benign paroxysmal positional vertigo** - lasts < 30 seconds;  
**Ménière's disease** - attacks last hours;  
**vestibular neuritis, labyrinthitis** - persists for days;  
**central vertigo** - may persist for years.

VESTIBULAR SUPPRESSANTS:

- a) **antihistamines** (e.g. **DIPHENHYDRAMINE, MECLIZINE, CYCLIZINE**) - decrease excitability of labyrinth and block conduction in vestibular-cerebellar pathways - **sedate vestibular system**.
- b) **benzodiazepines** (e.g. **LORAZEPAM, DIAZEPAM, ALPRAZOLAM**) - facilitate inhibitory GABA neurotransmission; particularly effective in *relieving distress of severe vertigo* by sedating vestibular system  
DIAZEPAM i/v is treatment of choice in acute attack
- c) **anticholinergics** (e.g. oral **SCOPOLAMINE** and **ATROPINE** in OTC preparations, transdermal **SCOPOLAMINE**, oral **GLYCOPYRROLATE**, rectal **PROCHLORPERAZINE**) - work centrally by suppressing conduction in **vestibular cerebellar pathways** - minimize **vagal-mediated GI symptoms**.
- d) **barbiturates** (e.g. **PENTOBARBITAL**) - to provide general sedation.
- e) **monoaminergics** (**EPHEDRINE**) - treat vertigo, possibly through modulating sympathetic system.