Audiology Lecture Notes

Slide 4:

-Mechanical and vibratory changes are perceived by the external and middle ear (conductive part).
- Sound wave will reach tympanic membrane.
-The tympanic membrane is driven into motion, which will move the malleus incus and stapes.
-Stapes at the oval window will conduct a mechanical vibration into the fluid of the inner ear.
- This will stimulate the hair cells, which will result in firing of the auditory pathway to the auditory cortex.

*Any lesion in the external ear or middle ear will result in conductive hearing loss.

*Any lesion in the inner ear will result in sensory neaural hearing loss

Slide 6:

* Condesation: Increase in density and pressure

* Rarefaction: Decreases in density and pressure

- Source: Vibration (e.g. Tuning Fork)
- Medium : Condensation and rarefaction of the medium will drive its particles into motion) series of condensation and rarefaction)
- Force: what disturbed the source.

Slide 9:

- cycles per second

Slide 13:

Dynamic range of hearing = 20 – 20,000

Slide 15:

Amplitude = Intensity of sounds = displacement of particles = difference between highest and lowest point in a wave.

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The 2 most important parameters of sound

1. Frequency (correlates to pitch)
2. Amplitude (correlates to loudness)

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-Pure tone audiometry tests different frequencies and reflects different anatomical sites through the basilar membrane.

-Hearing threshold = lowest intensity at a selected frequency which can be detected by subject.

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- Test different frequency to test whole cochlear stimulation
- Start with 1K hertz then increase to 2K – 4K – 8K – 16K the decrease to 500 – 250..
- 6 different frequencies are enough
- Low frequency = apical turn of the cochlea
- High Frequency = Basal turn of the cochlea

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- Hearing loss can be restricted to specific frequencies

Slide 20:

- Subjective method requires reliable patient. (Increase in age = increase in accuracy)
- Objective method records something from auditory system (pressure, biomechanical changes…etc.) by electrodes or other means.

Slide 30:

-Test different frequency then intensity

- Start at 40 then if not heard check above if intensity found, check right below then record highest intensity.

- DB steps = 5 (most commonly)

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- Hearing level in bone and air are the same
- Bone = Nerve = Cochlea

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If bone conduction is normal then there is conductive hearing loss.

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If both are affected the same then there is sensory neural hearing loss.

Slide 34:

- Both bone and air are affected due to both conductive and sensory neural
- Bone is better because it doesn't rely on air where air conduction relies on both air and sensory neural
- Gap between bone and air conduction is the conductive hearing loss

Slide 45:

- Type A: Normal Middle Ear
- Type B: Effusion in Middle Ear (Flat Curve)
- Type C: Pressure in the Middle Ear is negative (Eustachian tube defect) (curve is negative)
- Type As and Ad: ossicular chain dislocation (otosclerosis)

Slide 59:

- Otoacuastic emission is a test of the cochlea which checks the biomechanical activity of hair cells.
- Used for anyone at any age
- If no emission that means cochlear or sensory hearing loss

• Evoked Tests for firing of auditory nerve potential (which is directed to the auditory cortex
• Detects using electrode over skull (mastoid and forehead) and send sound through the auditory canal which shows a curve
• Most important wave is wave 5

Done !