

Rinne Test

Purpose

- To detect conduction hearing loss by comparing air conduction (AC) of sound to bone conduction (BC) of sound

Equipment

- 512 Hz tuning fork

Technique

1. Ensure the room is quite
2. Lightly vibrate the fork by stroking it between the thumb and index finger or tapping it on your knuckles
3. Place the base of the vibrating tuning fork on the mastoid bone (behind the ear and level with the ear canal)
4. Ask the patient if they hear anything
 - a. When the patient answers “yes” ask them to tell you the very instant the sound goes away
 - b. If no, the patient may have severe/total sensorineural hearing loss on that side
5. When the patient indicates they can no longer hear the sound, quickly place the vibrating tines as close as possible to the ear canal
 - a. Ensure the “U” of the tuning fork is facing forward which maximizes the sound for the patient
6. Ask the patient if they can hear the sound
7. Repeat the test on the opposite side

Alternative Technique:

1. Ensure the room is quite
2. Lightly vibrate the fork by stroking it between the thumb and index finger or tapping it on your knuckles
3. Hold the vibrating tuning fork 2.5 cm from the external ear for about 5 seconds
4. Ask the patient, “is the sound louder in the front”
5. Immediately place the base of the vibrating tuning fork on the mastoid process
6. Ask the patient, “or in the back?”
7. Repeat the test on the opposite side

Results

- **Normal:** sound is heard longer through air than bone ($AC > BC$)
- **Conductive hearing loss:** sound is heard as long or longer through bone than air ($BC \geq AC$)
 - Why? Air conduction through external/middle ear is impaired therefore vibrations through bone bypass the impairment to reach the cochlea
- **Sensorineural hearing loss:** sound is heard longer through air than bone ($AC > BC$) although both are decreased
 - Why? The inner ear/cochlear nerve is less able to transmit impulses regardless of how the vibrations reach the cochlea

Diagnostic Accuracy

- Sensitivity: 60%-90%
- Specificity: 95%-98%

References

1. Bickley LS et al. Bates' Guide to Physical Examination and History Taking. 11th ed. Philadelphia, PA: Lippincott Williams & Wilkins. 2013;237-238, 281.
2. McGee S. Evidence Based Physical Diagnosis. St. Louis: Elsevier, 2007.
3. Orient, JM. Sapiro's Art and Science of Bedside Diagnosis. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins. 2010;230-231.
4. Walker HK et al. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd ed. Boston: Butterworths; 1990. Chapter 126.