

Rinne test

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The **Rinne test** (RIN-ə) is a hearing test. It compares perception of sounds, as transmitted by air or by bone conduction through the mastoid. Thus, one can quickly suspect conductive hearing loss.

A Rinne test should always be accompanied by a Weber test to also detect sensorineural hearing loss and thus confirm the nature of hearing loss.

The Rinne test was named after German otologist Heinrich Adolf Rinne (1819-1868); the Weber test was named after Ernst Heinrich Weber (1795 – 1878).

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Procedure

The Rinne test is performed by placing a vibrating tuning fork (512 or 256 Hz) initially on the mastoid process until sound is no longer heard, the fork is then immediately placed just outside the ear. Normally, the sound is audible at the ear.

Air conduction uses the apparatus of the ear (pinna, eardrum and ossicles) to amplify and direct the sound whereas bone conduction bypasses some or all of these and allows the sound to be transmitted directly to the inner ear albeit at a reduced volume, or via the bones of the skull to the opposite ear.

In a normal ear, air conduction (AC) is better than bone conduction (BC)

$AC > BC$, and this is called a positive Rinne.

In conductive hearing loss, bone conduction is better than air

$BC > AC$, a negative Rinne.

In sensorineural hearing loss, bone conduction and air conduction are both equally depreciated, maintaining the relative difference of

AC > BC, a positive Rinne.

In sensorineural hearing loss patients there may be a false negative Rinne

BC > AC, a negative Rinne.

Note that the words positive and negative are used in a somewhat confusing fashion here, other than their normal use in medical tests. Positive or negative means that a certain parameter that was evaluated was present or not. In this case, that parameter is if air conduction (AC) is better than bone conduction (BC). Thus, a "positive" result indicates the healthy state, in contrast to many other medical tests.

Hazards

This test, and its complement the Weber test, are quick screening tests and are no replacement for formal audiometry.

Effect on opposite ear

The effect on the opposite ear, relative to the tuning fork, is reverse to the ear being tested. Here, conduction through the skull to the opposite side is more effective than conduction through room air around the head. Thus, if the normal ear is not masked, bone conduction could be reported as louder by the patient, even if both ears are normal.

References

- Tuning Fork Tests (<http://www.fpnotebook.com/ENT/Exam/TngFrkTsts.htm>) - Family Practice Notebook. Retrieved February 3, 2007.

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