Weber test

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The **Weber test** is a quick screening test for hearing. It can detect unilateral (one-sided) conductive hearing loss and unilateral sensorineural hearing loss. The test is named after Ernst Heinrich Weber (1795 – 1878).

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Performance

In the Weber test a vibrating tuning fork (either 256 or 512 Hz) is placed in the middle of the forehead equidistant from the patient's ears. The patient is asked to report in which ear the sound is heard louder. In a normal patient, the sound is heard equally loud in both ears (no lateralization). However a patient with symmetrical hearing loss will have the same findings. Thus, there is diagnostic utility only in assymmetric hearing losses.

Detection of conductive hearing loss

A patient with a unilateral conductive hearing loss would hear the tuning fork loudest in the affected ear. This is because the conduction problem masks the ambient noise of the room, whilst the well-functioning inner ear picks the sound up via the bones of the skull causing it to be perceived as a quieter sound in the unaffected ear. Another theory, however, is based on the occlusion effect described by Tonndorf et al in 1966. Lower frequency sounds (as made by the 512Hz fork) that are transferred through the bone to the ear canal escapes from the canal. If an occlusion is present, the sound cannot escape and appears louder on the ear with the conductive hearing loss.[1]

Conductive hearing loss can be mimicked by plugging one ear with a finger and performing the Rinne and Weber tests, which will help clarify the above. The simulation of the Weber test is the basis for the Bing test.

Detection of sensorineural hearing loss

A patient with a unilateral sensorineural hearing loss would hear the sound loudest in the unaffected ear, because the affected ear is less effective at picking up sound even if it is transmitted directly by conduction into the inner ear.

Incompleteness

This test is most useful in individuals with hearing that is different between the two ears. It cannot confirm normal hearing because it does not measure sound sensitivity in a quantitative manner. Hearing defects affecting both ears equally, as in Presbycusis will produce an apparently normal test result.

Additional Rinne test

Although no replacement for formal audiometry, a quick screening test can be made by complementing the Weber test with the Rinne test.

The Rinne test is used in cases of unilateral hearing loss and establishes which ear has the greater bone conduction. Combined with the patient's perceived hearing loss, it can be determined if the cause is sensorineural or conductive.

For example, if the Rinne test shows that air conduction (AC) is greater than bone conduction (BC) in both ears and the Weber test lateralizes to a particular ear, then there is sensorineural hearing loss in the opposite (weaker) ear. Conductive hearing loss is confirmed in the weaker ear if bone conduction is greater than air conduction and the Weber test lateralizes to that side. Combined hearing loss is likely if the Weber test lateralizes to the stronger ear and bone conduction is greater than air conduction in the weaker ear.

	Weber without lateralization	**Weber lateralizes left**	**Weber lateralizes right**
Rinne both ears AC>BC	Normal	Sensorineural loss in right	Sensorineural loss in left
Rinne left BC>AC		Conductive loss in left	Combined loss
Rinne right BC>AC		Combined loss	Conductive loss in right

References

1. ^ Weber's test demystified - Physics renders Weber's test not so mysterious... (http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1124596) Chima E Mbubaegbu, consultant orthopaedic surgeon.

Don't use stronger ear!! Thats hard to understand.