

# Auditory Brainstem Response Testing

The Auditory Brainstem Response (ABR) testing, sometimes referred to as Brainstem Auditory Evoked Response (BAER), or simply an evoked potential, is an objective test of auditory nerve function. There are two primary uses for this procedure. First, it can be used to rule out retrocochlear (meaning beyond the hearing organ) pathology. Secondly, it can be used to estimate auditory thresholds in children and infants or otherwise difficult to test patients, such as those who cannot report what they hear.

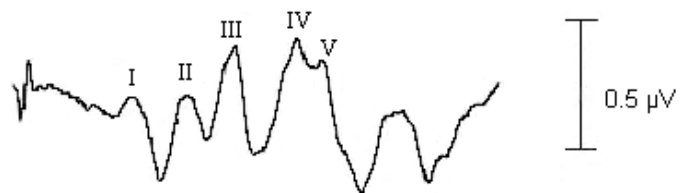
The procedure for ABR is very simple. The patient only to relax in a darkened room. The duration of the test is 20—60 minutes. The time varies per patient and what information the physician is seeking.

There are typically four surface/skin electrodes used. Two are placed on the center of the forehead, one above the other about 2 inches apart. The top electrode may be placed on the top of the head (but this can get messy). The remaining electrodes are placed one on each ear lobe, or behind the ear on the boney bump (mastoid bone).

Insert earphones are placed in each ear and the patient is instructed to close the eyes and relax during the test. Typically, the lights in the room are turned off to minimize external electrical interference. The patient hears a clicking sound during testing. Sometimes in the opposite ear their will be a static, or white noise. Depending on the bio-electric noise, or internal body noise, the collection of information may go quickly or take a little time.

Once the test is completed, the audiologist will analyze the data, write a report, and send it to the referring physician. The basic ABR wave form is shown in the picture below. Each of the numbered peaks represents specific locations along cranial nerve VIII, or acoustic nerve, and lower brainstem. These peaks should appear in a specific time pattern.

Waves I and II provide information regarding the auditory nerve as it is leaving the cochlea (hearing organ) and can help in diagnosing auditory neuropathy/dys-synchrony.



Waves III through V provide information about the transmission of neural impulses through the lower brainstem. Wave V is considered the most clinically useful wave. The timing of this wave can be of significant importance when trying to determine retro-cochlear (past the hearing organ) pathology, such as acoustic neuroma or vestibular schwannoma, a benign growth on the cranial nerve (hearing and balance nerve).

An abnormal ABR may be a consistent finding with high frequency hearing loss or profound deafness, it may also be an indication that further testing is required. However, only the referring physician will be able to determine if further tests or procedures are required.



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