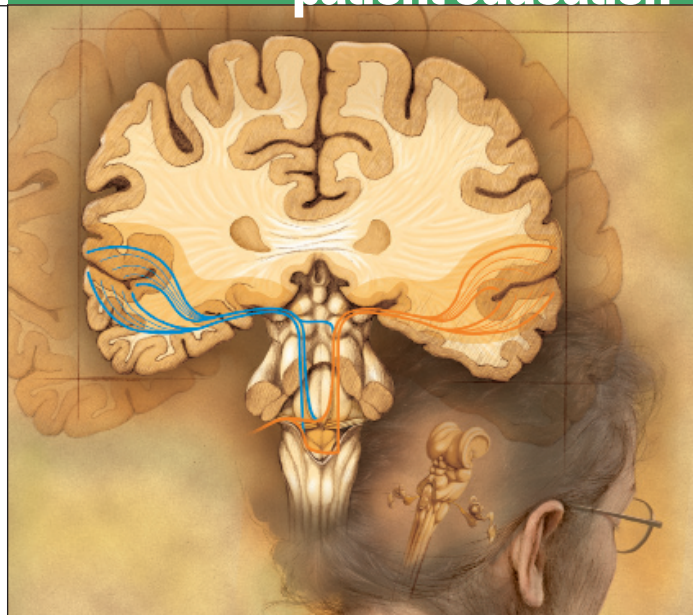


## Electrophysiological Auditory Assessment: The BAEP

**A** brainstem auditory evoked potential (BAEP) test is a safe and effective way to assist audiologists and physicians in collecting valuable information to help isolate hearing and other neurologically related problems. With few discomforts, it is a very valuable diagnostic tool for helping patients live healthier and happier lives.<sup>1,2,3</sup>



Understanding begins with the term “event-related potentials” (ERPs), which are electrically generated brain responses linked to an “event.” The event is normally a sensory stimulus (such as a visual flash or sound), a brain function (like recognizing a word) or the omission of a stimulus (i.e. increased time delay between stimuli). Auditory evoked potentials (AEPs) are a form of ERPs in which the event is normally a sound.

Selected sounds are used to create a response by the central nervous system. The response also creates a very small electrical voltage potential that may be recorded by head-placed electrodes and used for assessing the auditory system. While AEPs do not specifically measure hearing like pure tone and speech discrimination hearing tests, they do measure important electrical responses to special sounds that help an audiologist assess a person’s auditory system. If the responses are recorded from the brainstem, they are referred to as BAEPs. This kind of testing is administered to infants, young children, adolescents, and adults.

Because the electrical voltages (potentials) created by auditory sounds are very small and the brain is already creating a wide array of other potentials, special equipment is needed to record these potentials. Special electrodes, sensitive amplifiers and a computer system are used to measure the auditory potentials.<sup>1,2,3</sup>

BAEPs are frequently created using a series of auditory clicks. Electrodes placed on the scalp record electrical potentials caused by the central nervous system’s responses to the clicks. BAEPs measure the amplitude of the response and the time it takes for the auditory response to travel from the inner ear to the brainstem. Abnormal amplitudes and time delays resulting from a compromised auditory system help audiologists and physicians to locate some types of ear-related problems.

Prior to testing, the audiologist and physician will provide instructions for preparation. For example, the patient may be asked to wash his/her hair the night

prior to the examination. Few dietary restrictions are normally given. Additionally, the patient should inform the audiologist if he/she is wearing a hearing aid.

The BAEP test is safe and causes little or no discomfort. There are rarely any side effects, with the most common being a minor skin irritation from the electrodes. Patients are normally placed in a room and seated or asked to recline in a comfortable area. Special areas of the head are cleaned and prepared for small electrodes to be placed on the skin. Electrodes are normally placed on the scalp and/or earlobe.

Special ear inserts or headphones are given to the patient to hear the sounds that will be used. It is important for the patient to follow all directions. A sound that the patient likely may hear is a series of clicks. The electrodes record the brainstem electrical potentials, which are next transmitted by small wires (or wirelessly) to a specially configured amplifier system, and then an amplifier sends the signals to a computer for special analysis.

The results are read, interpreted, and written as a report by an audiologist. The written report is frequently shared with the patient by the physician that made the referral for the BAEP tests. The results of the BAEP tests are used in conjunction with the patient’s case history and other testing that may have been requested.

The results of the BAEP may help to demonstrate hearing loss, a tumor or neurological delays, such as multiple sclerosis, neural inflammation and other neural anomalies. **\$**

### REFERENCES

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2. American Speech Language Hearing Association: [www.asha.org/public/hearing/testing/](http://www.asha.org/public/hearing/testing/)
3. University of Michigan: [www.med.umich.edu/1libr/tests/testa14.htm](http://www.med.umich.edu/1libr/tests/testa14.htm)

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