

## Evoked Potentials

Evoked potential (EP) tests measure the electrical activity of the brain in response to stimulation of specific sensory nerve pathways. They are able to detect the slowing of electrical conduction caused by demyelination along these pathways even when the change is too subtle to be noticed by the person or to show up on neurologic examination. Because the diagnosis of MS requires evidence of demyelination in two distinct areas of the central nervous system, EP testing can help confirm the diagnosis by enabling the physician to identify a second demyelinating event that wasn't otherwise apparent.

In order to measure evoked potentials, wires are placed on the scalp overlying the areas of the brain being stimulated. The examiner then provides specific types of sensory input (e.g., sound, light, or sensation), and records the responses of the person's brain. Evoked potential testing is harmless, generally painless, and is a very sensitive technique for detecting lesions—or damaged areas.

### Types of Evoked Potential Tests

Three types of evoked potential testing have been used in the past to help confirm a diagnosis of MS:

1. **Visual Evoked Potentials** (VEP): The patient sits before a screen on which an alternating checkerboard pattern is displayed.
2. **Brainstem Auditory Evoked Potentials** (BAEP): The patient hears a series of clicks in each ear.
3. **Sensory Evoked Potentials** (SEP): Short electrical impulses are administered to an arm or leg.

The current diagnostic criteria for MS consider only VEP findings because this particular EP study has been shown to be the most useful. The VEP is used to identify impaired transmission along the optic nerve pathways, which is a fairly common early finding in MS, even in someone who has never been aware of any visual symptoms. The results of VEP testing are interpreted by a neurologist or neurophysiologist with specialized training in the use of these tests.

Despite the fact that VEPs are used to help make a diagnosis of MS, other conditions can also produce abnormal results, so this test is not specific for MS. The information the tests provide needs to be considered along with other laboratory and clinical information before a diagnosis of MS can be made.

## See also...

### Sourcebook

- Cerebrospinal Fluid (CSF)
- Diagnosis
- Early Treatment (Disease Management Consensus Statement)
- Magnetic Resonance Imaging (MRI)

### Society Web Resources

- Diagnosis of MS  
[www.nationalmssociety.org/Diagnosis](http://www.nationalmssociety.org/Diagnosis)
- For People Newly Diagnosed  
[www.nationalmssociety.org/NewlyDiagnosed](http://www.nationalmssociety.org/NewlyDiagnosed)

### For Healthcare Professionals

- Tip Sheet: McDonald Diagnostic Criteria for MS  
[www.nationalmssociety.org/ClinicianResources](http://www.nationalmssociety.org/ClinicianResources)

### Book

Kalb R. (ed.) *Multiple Sclerosis: The Questions You Have; The Answers You Need* (3<sup>rd</sup> ed.). New York: Demos Medical Publishing, 2004.  
—Ch. 2 Neurology

Kalb R. (ed.). *Multiple Sclerosis: A Guide for Families* (3<sup>rd</sup> ed.). New York: Demos Medical Publishing, 2005  
—Ch. 1 When MS Joins the Family

The National Multiple Sclerosis Society is proud to be a source of information about multiple sclerosis. Our comments are based on professional advice, published experience, and expert opinion, but do not represent individual therapeutic recommendations or prescription. For specific information and advice, consult your personal physician.

To contact your chapter, call **1-800-FIGHT-MS** (1-800-344-4867) or visit the National MS Society web site: [www.nationalmssociety.org](http://www.nationalmssociety.org).

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