

## Electroencephalogram (EEG) basic level

### Overview

An electroencephalogram is a painless test that records electrical patterns in your brain called brain waves. The test is used to help diagnose conditions such as seizures, epilepsy, head injuries, dizziness, headaches, brain tumors and sleeping problems. It can also be used to confirm brain death.

### How does an EEG work?

The billions of nerve cells in your brain produce very small electrical signals that form patterns called brain waves. About 20 small electrodes (wires) are attached to your head with special glue. These electrodes pick up your brain waves and send them to an EEG machine. The machine amplifies the signals and records them in a wave pattern either on graph paper or a computer screen (Figure 1).

An EEG only measures electricity that your brain makes; it does NOT measure thoughts or feelings, and it doesn't send any electricity into your brain.

### Types of EEG testing

**Standard EEG** recording is done in the office and usually lasts an hour. You may be asked to do a sleep-deprived EEG, which requires you to have only 4 hours of sleep. Abnormal brain waves may appear when the body is stressed or fatigued. This exam usually takes 2-3 hours. You will be given specific instructions regarding food, drink and medications that may need to be avoided.

**Ambulatory EEG** involves wearing a portable EEG recorder on a belt around your waist for several days or weeks. The EEG recorder along with a diary you keep of daily activities and drug dosages helps the doctor relate your activity to specific EEG recordings.

**Video EEG** monitoring is available in specialized centers for patients with frequent seizures or sleep disorders. You stay in the hospital and are monitored both by EEG and a video camera. This allows you to be observed during a seizure so that your physical behavior can be monitored at the same time as your EEG.

### Who performs the test?

A technician can perform the test in the doctor's office, a specially designed clinic, or in the hospital.

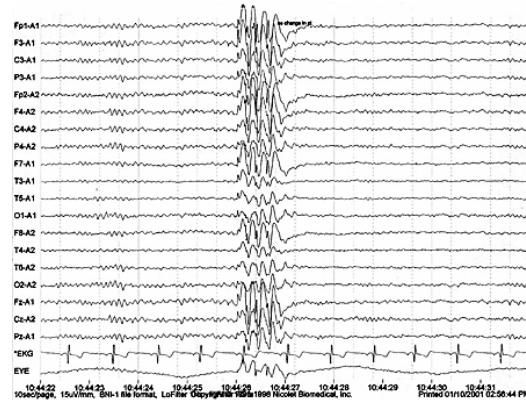


Figure 1. A sample EEG recording showing a focal spike typical in a seizure.

### How should I prepare for the test?

- Make sure that you have clean, freshly washed hair free from any styling products. If you have long hair, do not braid, tie or pin it up.
- You may eat regular meals, but avoid drinks that contain caffeine for at least four hours before the test.
- Do not nap before the test.
- Continue taking your medicine unless your doctor tells you to stop.

### What happens during the test?

You will be asked to lie on a table or sit in a reclining chair. About 20 small electrodes will be attached to your head with washable glue. The technician may ask you to do several things during the test, such as asking you to open and close your eyes, breath deeply and rapidly (hyperventilation), or look at a flashing light. Most of the time you will just lay still with your eyes closed.

### What happens after the test?

The technician will remove the electrodes and you should wash the glue out of your hair.

### What are the risks?

There are no risks from an EEG.

## How do I get the results and what do they mean?

A neurologist, or a doctor who specializes in brain and nervous system problems, reads your EEG. He or she will communicate directly with your referring doctor, who in turn will discuss the results with you.

An EEG can tell your doctor about brain activity. For example, if you have a seizure disorder, the EEG can tell your doctor where any abnormal activity in your brain comes from and can help distinguish between generalized or focal seizures. An EEG is of value for diagnosing epilepsy only if it picks up patterns typical of epilepsy. If it doesn't pick up the right patterns, you may still have epilepsy and ambulatory monitoring or video EEG may be necessary.

## Sources & Links

If you have further questions about this diagnostic test, contact the doctor that ordered the test.

## Sources

British Epilepsy Association / The EEG  
[www.epilepsy.org.uk/info/eegfrm.html](http://www.epilepsy.org.uk/info/eegfrm.html)

[www.nlm.nih.gov/medlineplus/diagnosticimaging.html](http://www.nlm.nih.gov/medlineplus/diagnosticimaging.html)

## Glossary

**electrode:** a conductor that carries current. Can be used for diagnostic testing to receive and record electrical activity of nerves.

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