

Electroencephalogram (EEG) basic level

Overview

An electroencephalogram (EEG) is a noninvasive test that records electrical patterns in your brain. 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. During an EEG, small electrodes and wires are attached to your head. The electrodes detect your brain waves and the EEG machine amplifies the signals and records them in a wave pattern on graph paper or a computer screen (Fig. 1).

There are several different ways to conduct an EEG:

- **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 to 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.

What does an EEG show?

An EEG measures electrical activity that your brain makes; it does NOT measure thoughts or feelings, and it does not send any electricity into your brain. It is most often used to determine the type and origin of seizures. For example, if you have a seizure disorder, the EEG can show where abnormal

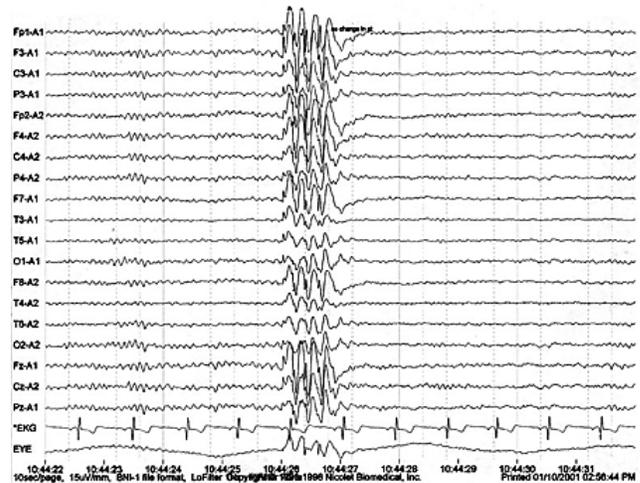


Figure 1. A sample EEG recording showing a focal spike typical in a seizure.

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 detects patterns typical of epilepsy. If it doesn't detect the right patterns, you may still have epilepsy and ambulatory monitoring or video EEG may be necessary.

EEG can also detect abnormal brain waves after a head injury, stroke, or brain tumor. Other conditions such as dizziness, headache, dementia, and sleeping problems may show abnormal brain patterns. It can also be used to confirm brain death.

Who performs the test?

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

How should I prepare for the test?

- Make sure your hair is clean, freshly washed, and 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 4 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 lie 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 test results?

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

Sources & links

If you have further questions about this diagnostic test, contact the doctor that ordered the test or visit:

www.nlm.nih.gov/medlineplus/diagnosticimaging.html

www.epilepsy.com

Glossary

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

seizure: uncontrollable convulsion, spasm, or series of jerking movements of the face, trunk, arms, or legs.

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