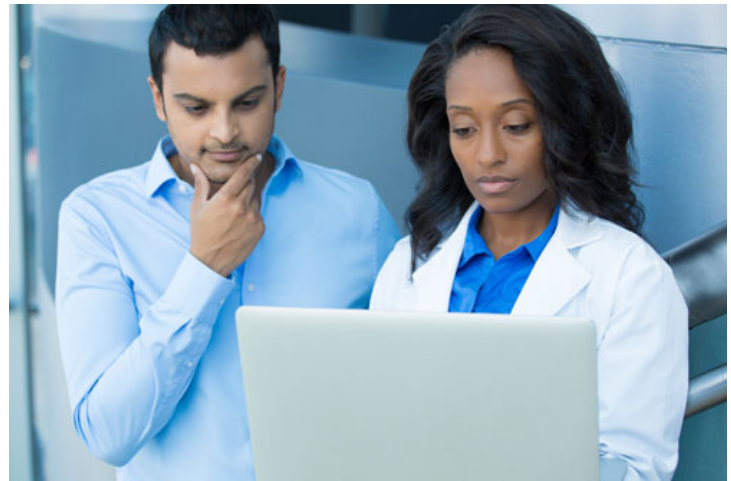




Epilepsy

The term epilepsy is used to describe brain disorders that involve repeated seizures – sudden, uncontrollable waves of electrical activity in the brain that cause involuntary body movement, a change in attention, or a loss of consciousness. Seizures may be generalized, in which the entire brain is involved, or focal, in which the abnormal activity occurs in one part of the brain.

Your doctor may conduct a physical exam, electroencephalogram (EEG), head CT, head MRI or lumbar puncture to help diagnose your condition. Treatment options – including medication and surgery – depend on the underlying cause.



What is epilepsy?

The term epilepsy is used to describe brain disorders that involve repeated seizures, or convulsions. A seizure is a sudden, uncontrollable wave of electrical activity in the brain that causes involuntary bodily movement, a change in attention or a loss of consciousness. The word epilepsy does not imply a particular underlying cause for the seizures, which can be diagnosed in some patients but remain unknown in others.

Symptoms vary from person-to-person, depend on the type of seizure the individual is experiencing and often are related to the normal function of the affected part of the brain.

There are two major types of seizures: generalized, in which the entire brain is involved, and focal, in which abnormal activity occurs in one part of the brain.

Generalized seizures include a petit mal seizure (also called an absence seizure), during which the patient stares into space for a short period of time, and a grand mal seizure (also called a tonic-clonic seizure), in which the patient experiences a stiffening of muscles, violent shaking and a loss of consciousness. Many people experience a sensory change or sensation, such as a tingling or dizziness, immediately before a grand mal seizure.

During a focal seizure, symptoms typically affect one area of the body such as a jerking arm or leg. A

focal seizure may remain localized or it may spread and become a generalized seizure.

How is epilepsy diagnosed and evaluated?

In addition to conducting a physical examination, a physician will typically perform an EEG (electroencephalogram) to check the electrical activity of the brain. Imaging tests may also be performed to find the cause and location of foci causing seizures. These include:

- **CT imaging of the head:** Computed tomography (CT) scanning combines special x-ray equipment with sophisticated computers to produce multiple cross-sectional images or pictures of the skull and brain. See the Safety page for more information about CT.
- **MRI of the head:** Magnetic resonance imaging (MRI) uses a powerful magnetic field, radio frequency pulses and a computer to produce detailed pictures of organs, soft tissues, bone and virtually all other internal body structures. This is the best available imaging examination to obtain pictures of the structure and sometimes even function of the brain.
- **Lumbar puncture (also called a spinal tap):** This diagnostic test involves removing and analyzing a small amount of cerebrospinal fluid—the fluid that surrounds the brain and spinal cord — from the lumbar (or lower) region of the spinal column. Physicians use a lumbar puncture to help diagnose infections, bleeding around the brain, cancers involving the brain and spinal cord, and inflammatory conditions of the nervous system. Lumbar punctures can be performed at the bedside or with imaging guidance.
- **Magnetoencephalography (MEG):** MEG is a non-invasive medical test that measures the magnetic fields produced by your brain's electrical currents to identify the exact location of the source of epileptic seizures.

How is epilepsy treated?

Treatment for epilepsy includes medical management or may include surgery, depending on the underlying abnormality that is causing the seizures. Medication (anticonvulsants) which may prevent or reduce the frequency of seizures, is the first line of treatment for the vast majority of seizures. Surgery may be considered if a patient's seizures are due to a focal underlying abnormality such as a tumor, a developmental anomaly of brain tissue, abnormal blood vessels, called vascular malformations, or bleeding in the brain.

Surgery may also be considered for patients who do not respond to medical management. MRI, nuclear medicine and MEG exams, which help identify subtle malformations of the brain tissue itself, greatly improve the success of surgery by guiding the surgeon to the area causing the seizures and defining the extent of the abnormality to determine how much brain tissue to remove.

A procedure called vagus nerve stimulation (VNS) is also used to help reduce seizures. In VNS, a device similar to a heart pacemaker called a vagus nerve stimulator is implanted underneath the skin and delivers

short bursts of electrical impulses to the brain through an electrode placed near the vagus nerve.

Some people with epilepsy may be able to stop taking anti-seizure medication after being free of seizures for several years.

Certain types of childhood epilepsy may go away or improve with age.

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