

# Seizure & Epilepsy Overview



## What is epilepsy?

Epilepsy is a neurological disease that causes people to have recurrent seizures. A seizure is a brief disruption of electrical activity in the brain.

- Epilepsy is not contagious.
- Epilepsy is a medical condition, like asthma and diabetes.
- Epilepsy is a developmental disability when it starts before age 18.
- Often seizures are the main problem for people with epilepsy, but other neurological or developmental problems can be seen too.



## What causes epilepsy?

More than half the time, the cause is unknown. When a cause can be found, it is often one of these:

- Head injury
- Infection of the brain
- Stroke
- Brain tumor
- Alzheimer's disease
- Malformation of an area of the brain
- Genetic factors

## Who has epilepsy?

In the United States, 3.4 million people live with epilepsy, and over 150,000 new cases are diagnosed each year. **One in 26 people** will develop epilepsy at some point in their life. Epilepsy doesn't discriminate. It affects children and adults, men and women, and people of all races, religions, ethnic backgrounds, and social classes. While epilepsy is most often diagnosed either in childhood or after the age of 65, it can occur at any age.



## How is epilepsy diagnosed?

- A good description of the event and ideally an eyewitness account or video recording is key to determining if the event was a seizure and what kind.
- A medical history, physical and neurological exam, blood work, and other tests are important. These help diagnose epilepsy and look for other conditions or causes.
- An EEG is one of the most important tests. It records the brain's electrical activity. Some patterns of activity are unique to certain types of seizures.
- Imaging tests (like a CT, MRI, or PET scan) look at the structure and function of the brain. An MRI is needed for anyone with new onset of seizures. PET scans or other advanced imaging may be done later.

## How is epilepsy treated?

**Medication** – Drugs used to treat epilepsy are called anti-seizure medication.

- More than 30 anti-seizure medications are currently approved to treat epilepsy.
- About 6 in 10 people may control their seizures with the first or second medicine they try.
- Yet a survey of adults in the community found that 56% still have seizures.
- Regardless of the numbers, if a person does not get control of seizures in the first year or after the first 2 or 3 medicines are tried, they should be seen by an epilepsy specialist.
- Options beyond medicines may be possible.



**Surgery** – Certain types of surgery may be used for people whose seizures do not respond to medication. Surgery may be recommended when a seizure focus can be found and removed without hurting vital functions like speech or movement. For other types of surgery, visit [epilepsy.com/surgery](http://epilepsy.com/surgery).

**Vagus Nerve Stimulation (VNS)** – A small device (generator) is implanted under the skin in the left side of the chest. A small thin wire or electrode goes from the generator and is attached to the vagus nerve in the neck. VNS may be an option if surgery doesn't work or is not right for you. The benefits of the VNS appear to improve over time. For example, about 45% of people have seizures decreased by 50% or more within one to two years.

**Responsive Neurostimulation (RNS)** – This is another device to treat seizures. It is implanted under the scalp in a small area of the skull or bone surrounding the brain. One or two wires from the device are placed under or on the surface of the brain where seizures start. The device is able to sense a seizure and sends small pulses of electrical current through the wires to help stop or lessen seizures. RNS also may help people who can't have surgery or when surgery doesn't work well enough. Like the VNS, the RNS does not cure epilepsy and it may not work right away. Yet it can help stop or lessen the number of seizures a person has by 40% to 60% after one to three years.

**Deep Brain Stimulation (DBS)** – DBS is a new type of device that also helps control seizures when surgery doesn't work or cannot be done. Electrode wires are placed in a specific area of the brain. The device is programmed, like VNS, to give stimulation to interrupt or stop seizures.

**Dietary Therapies** – Dietary therapies can help control seizures in both children and adults. They are usually used when seizures do not respond to medicine. The most common diet therapy is the ketogenic diet. This is a medically supervised high fat and low carbohydrate diet. There are three other diets that also help control seizures in some people. Most people who use a diet therapy continue taking medicine



Seizures can take many different forms, not just the convulsive type that most people associate with epilepsy.

## Types of seizures

Common types of seizures include:

**Generalized Onset - Tonic-Clonic (Grand Mal)** – Convulsions, rigid muscles, jerking; typically lasts 1 to 3 minutes and followed by period of confusion.

**Generalized Onset - Absence (Petit Mal)** – Blank stare lasting only a few seconds; sometimes with blinking or chewing motions.

**Focal Onset - Impaired Awareness (Complex Partial)** – Staring and dazed facial expression; person is not aware of what is going on or will not remember; person may perform repetitive random movements and may not be able to talk normally; typically lasts 1 or 2 minutes and may be followed by confusion.

**Focal Onset - Aware (Simple Partial)** – Jerking in one or more parts of the body or sensory or perceptual changes that may or may not be obvious to onlookers; the person is aware of what occurs during the seizure.

**Atonic (Drop Attacks)** – Sudden collapse with recovery within a minute.

**Myoclonic** – Sudden, brief, massive jerks involving all or part of the body.