

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.

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 to 20 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 does 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 loss of muscle tone, may fall 'like a rag doll'.

Myoclonic - Sudden brief shock-like jerks of a muscle or group of muscles

How is epilepsy treated?

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

- About 6 in 10 people may control their seizures with the 1st or 2nd 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 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.

Vagus Nerve Stimulation (VNS) – A small device (generator) is implanted under the skin in the left side of the chest. A small thin wire is passed under the skin from the device to the vagus nerve in the neck. The device is programmed to send stimulation to the brain. 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, seizures decrease by about 50% or more in about 45% of people who try VNS.

Responsive Neurostimulation (RNS) – An RNS device is implanted under the scalp. 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 send stimulation to stop the seizure. 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%.

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. DBS can lessen seizures in about half of people who use the device.

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.



Seizure First Aid

- **STAY** with the person until they are awake and alert after the seizure. Time the seizure. Remain calm. Check for medical ID.
- Keep the person **SAFE**. Move or guide away from harm.
- Turn the person onto their **SIDE** if they are not awake and aware. Keep airway clear. Loosen tight clothes around the neck. Put something small and soft under the head.

CALL 911 IF:

- Seizure lasts longer than 5 minutes
- Repeated seizures
- Person does not return to their usual state
- First time seizure
- Person is injured, pregnant, or sick
- Difficulty breathing
- Seizure occurs in water

DO NOT

- Do **NOT** restrain.
- Do **NOT** put any objects in the mouth. Rescue medicines can be given if prescribed by a health care professional.

Disclaimer: This publication is designed to provide general information about epilepsy and seizures to the public. It is not intended as medical advice.

People with epilepsy should not make changes to treatment or activities based on this information without first consulting their health care provider.

This publication is made possible with funding from the Centers for Disease Control and Prevention (CDC) under cooperative grant agreement number 1NU58DP006256-04-00. Its contents are solely the responsibility of the Epilepsy Foundation and do not necessarily represent the views of the CDC.

About the Foundation: The Epilepsy Foundation, and its network of 50 organizations throughout the United States, leads the fight to overcome the challenges of living with epilepsy and to accelerate therapies to stop seizures, find cures, and save lives. To learn more, please visit epilepsy.com.