

Epilepsy: The Basics

WHAT IS EPILEPSY?

Epilepsy is a chronic, noninfectious, neurologic condition defined by seizures (which involve abnormal electrical discharges in the brain). After a person has had two or more unprovoked seizures—not caused by an immediate recognizable stimulus such as a stroke, brain tumor, or traumatic brain injury—he or she is considered to have epilepsy. Common diagnostic tests include electroencephalography (EEG), which measures electrical activity in the brain, and brain scans, such as magnetic resonance imaging (MRI) or computed tomography (CT). In the United States, an estimated 2.2 million people have epilepsy.

WHAT ARE THE SYMPTOMS?

The symptoms of epilepsy are recurring seizures, which can include temporary loss of awareness or consciousness and disturbances of movement, sensation (including vision, hearing, and taste), mental function, or mood (such as anxiety and depression). Several different types of seizures can occur with epilepsy.

Focal seizures begin with an electrical discharge in one limited area of the brain. Primary generalized seizures usually begin with a widespread electrical discharge that involves both sides of the brain at the same time. In 2017, the International League Against Epilepsy revised its classification of seizures based on new research and insights about where they start in the brain. The new system helps make diagnosing seizures more accurate and can help inform decisions about appropriate treatments. Neurologists now characterize seizures in three major categories:

- ▶ **Focal onset**, which starts in a network of cells on one side of the brain
- ▶ **Generalized onset**, which involves networks on both sides of the brain
- ▶ **Unknown onset**, which is used when it's not clear where the seizure started; as more information is learned over time or through testing, the seizure type may be revised to a generalized or focal-onset seizure

Each of the three categories is characterized further to determine the patient's level of awareness during a seizure and if the patient had motor symptoms (jerkings, stiffness, or loss of muscle tone, among others) and/or non-motor symptoms such as changes in heart rate, breathing, pallor, a blank stare, or problems talking or understanding, which may indicate cognitive changes.

WHAT CAUSES IT?

Researchers continue to search for the root causes of epilepsies in children, adults, and the elderly, as well as seizures that are provoked by such events such as stroke or transient ischemic attacks; dementia; traumatic brain injuries, including injuries during birth; infections, including brain abscess, meningitis, encephalitis, and acquired immune deficiency syndrome (AIDS); developmental and metabolic disorders, including cerebral palsy, neurofibromatosis, tuberous sclerosis, and autism; brain tumors; abnormal blood vessels in the brain; and genetic abnormalities.

HOW IS IT TREATED?

For about 60 percent of those diagnosed with epilepsy, seizures can be controlled with medications and surgical procedures. Some drugs are more effective for specific types of seizures. In some patients, special diets may help to control seizures when medications are either not effective or cause serious side effects. Some antiepileptic drugs are linked to pregnancy risks. Women of reproductive age should discuss their options with their neurologists before conceiving.

For *Neurology Now* articles on epilepsy, go to bit.ly/NN-Epilepsy.

For resources and support, contact:

- ▶ Citizens United for Research in Epilepsy: CUREpilepsy.org; 312-255-1801
- ▶ Epilepsy Foundation: epilepsyfoundation.org; 800-332-1000
- ▶ Intractable Childhood Epilepsy Alliance: ice-epilepsy.org
- ▶ The North American Antiepileptic Drug Pregnancy Registry: aedpregnancyregistry.org; 888-233-2334

SOURCES: NATIONAL LIBRARY OF MEDICINE; NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE; EPILEPSY FOUNDATION; NEUROLOGY NOW.