



Patient Information

Seizures and Epilepsy

Your brain contains a complex network of nerve cells, or *neurons* (**nyuh-ronz**), that constantly send and receive electrical and chemical signals. Normally, your brain processes about 80 of these signals per second. Sometimes, though, the neurons start firing these signals at a much faster rate—up to 500 per second—resulting in a seizure. It's not always clear why this occurs, but certain diseases, brain damage, and abnormal brain development all can play roles.

There are over 30 types of seizures, which are divided into two main categories: generalized (affecting the whole brain) and partial (affecting only part of the brain). A person having a partial seizure may remain alert but feel unprovoked emotions or see, hear, or smell things that aren't there. He or she might blink or twitch repeatedly, or simply stare into space. In more severe, generalized seizures, the person may cry out and fall to the floor, become stiff or limp, or make repeated jerking motions.

If you experience a seizure more than once, your doctor may diagnose you with a condition called *epilepsy* (**ep-uh-lep-see**). More than two million Americans have been diagnosed with epilepsy. While this disorder has no cure, about 80% of the people who have epilepsy are able to control their seizures with medication, surgery, or other treatments.

How do I know if I'm at risk?

Since doctors aren't sure why all seizures occur, risk of epilepsy can be difficult to predict. Researchers believe that family history may play a role—as can brain damage stemming from a head injury, lack of oxygen during birth, a tumor, alcohol abuse, heart disease, or stroke. Your risk of epilepsy is also greater if you have another brain disorder, such as cerebral palsy or autism; are younger than two or older than 65; or have been exposed to toxic amounts of lead or carbon monoxide.

Epileptic seizures may be triggered by lack of sleep, exposure to bright lights, increased caffeine or alcohol intake, cigarette smoking, stress, or elevated hormone levels during certain menstrual stages.

What are the warning signs?

Most seizures have no warning signs, though some are preceded by a set of peculiar sensations, called an *aura*, which is actually a very mild seizure.

The characteristics of a seizure, including how long it lasts, depend largely on what part of the brain is affected. Most seizures last a few seconds to a few minutes.

If a friend or family member has a seizure with convulsions or loss of consciousness, follow these steps: Roll the person onto his or her side. Cushion the head and loosen tight clothing. Don't restrict the person from moving unless he



or she is in danger, and don't put anything in the person's mouth—contrary to popular belief, the tongue can't be swallowed during a seizure. Keep the person's airway open by holding the jaw gently and tilting the head back until the seizure ends.

Usually, epileptic seizures resolve on their own without medical attention. But if a person has a seizure and is pregnant, the seizure lasts longer than five minutes, or the person fails to "wake up" after the seizure ends, call 911 immediately.

What tests do I need?

After a first seizure, your doctor will study your medical history and ask questions about your seizure. If possible, bring someone who can describe your seizure and say how long it lasted, since you may not remember it well. You'll undergo an *electroencephalogram* (ee-leck-troe-in-sef-uh-luh-gram), or EEG, which uses tiny wires taped to your head to record your brain waves and can reveal abnormalities that may have caused the seizure. Another important tool in diagnosing epilepsy is the brain scan, which produces images of your brain. All of these steps help your doctor decide how best to control future seizures.

How can I avoid the problem?

Since it isn't clear why all seizures occur, there's no surefire way to prevent epilepsy. But if you do have the condition, you can reduce the frequency of seizures by following your doctor's treatment plan to the letter. Also, limit your intake of caffeinated and alcoholic beverages. Follow regular sleep cycles and avoid unusual stress.

How is it treated?

Effective epilepsy treatment depends on accurate diagnosis. Each form of epilepsy responds differently to the various treatments, so it may take time for you and your doctor to find the best treatment for you.

The most common epilepsy treatment option is medication, and it's usually tried first. Take each drug exactly as it's prescribed. Be sure to ask what to do if you miss a dose. If your medications are working well and you've been seizure free for two to five years, your doctor may reduce the dosages slowly and eventually discontinue the medications. But don't try this on your own—stopping treatment unexpectedly can lead to more severe seizures.

Surgery also may be an option. Your eligibility depends mainly on what part of your brain is affected and your seizure type. These procedures generally involve separating or removing the brain section where seizures originate. While surgery can reduce or stop seizures, it isn't without risk.

Epilepsy also can be treated in some people with a vagus nerve stimulator, or VNS. This device is implanted in the skin of the chest. Connected wires running under the skin attach to a large nerve in the neck and deliver small bursts of electricity that can reduce seizures by up to 40%.

A final epilepsy treatment option, called the *ketogenic* (key-toe-jen-ick) diet, is used mostly in children. This diet is rich in fats and low in carbohydrates, causing the body to break down fats for energy. Scientists aren't sure why this helps control seizures, but it's effective in over half the people who use it. It should be tried only under the supervision of a doctor. ●

