

Seizures basic level

Overview

A seizure (also called a fit, spell, convulsion, or attack) is the visible sign of a problem in the electrical system that controls your brain. A single seizure can have many causes, such as a high fever, lack of oxygen, poisoning, trauma, a tumor, infection, subarachnoid hemorrhage, or after brain surgery. Most seizures are controlled with medication. If your seizures occur repeatedly, then you may have the chronic disorder called epilepsy.

What is a seizure?

Your seizure results from an abnormal electrical discharge in your brain. This abnormal "short circuit" can cause a change in behavior without you being aware of what is happening. During a seizure you may fall down, stare into space, make jerking movements, or have a funny feeling in your stomach. You cannot control what's happening while you are having a seizure. Your only memory of a seizure may be waking up with people asking questions such as "What is your name?" "Where are you?" and "What day is it?"

Some seizures have "triggers" such as flashing lights, lack of sleep, stress, medications, or low blood sugar.

What causes seizures?

Approximately 70% of seizures have unknown causes. One in 10 people will have a seizure during their lifetime. Known causes include:

Neurologic

- lack of oxygen to the brain
- poisoning (lead, carbon monoxide)
- head injury
- genetic defect in the brain
- brain tumor
- arteriovenous malformation (AVM)
- following brain surgery
- infection (meningitis, encephalitis, abscess)

Cardiovascular

- stroke
- irregular blood pressure
- irregular heart beat (arrhythmia)

Other

- kidney or liver failure
- metabolism disorders

- low blood sugar (diabetes), hypoglycemia
- pregnancy
- withdrawal from drugs or alcohol
- high fever (febrile seizure) usually in children

Psychologic (non epileptic attack)

- Hysteria or panic attacks
- Hyperventilation
- Mental illness

Often confused with seizures is a condition called syncope, which is a fainting spell caused by a lack of blood flow to the brain. Syncope can be caused by treatable cardiovascular disease.

Types of seizures

The most common seizure types are classified as either partial or generalized. Partial seizures arise from one part of the brain and include simple partial and complex partial seizures. Generalized seizures seem to involve the entire brain and include generalized tonic-clonic, absence, myoclonic, as well as tonic and atonic seizures.

Generalized seizures

If you have this type of seizure, your whole brain is involved and you lose consciousness. The seizure may then take one of the following five forms:

- In a generalized tonic-clonic convulsive seizure (previously called "grand mal" seizure), you become rigid, and may fall if standing. Your muscles switch between periods of spasm and relaxation with jerking motions. You may bite your tongue. Your breathing is labored and you may urinate or defecate involuntarily.
- In a tonic seizure, your muscles generally stiffen without rhythmical jerking. This stiffening or rigidity also involves the breathing muscles and you may cry out or moan.
- In an atonic seizure (also known as a drop attack), your muscle control is suddenly lost, causing you to fall if you are standing.
- In a myoclonic seizure, your limbs jerk abruptly. These seizures often occur soon after you wake up, either on their own or with other forms of a generalized seizure.

- In an absence seizure, your consciousness is briefly interrupted, with no other signs, except perhaps for a fluttering of your eyelids. These seizures happen most often in children and are sometimes known as "petit mal" seizures.

Partial seizures

If you are having a partial seizure, the disturbance in brain activity begins in or involves a distinct area of your brain. The nature of these seizures is usually determined by the function of the part of your brain that is involved. For example, if the motor cortex area of your brain is affected, then your arm or leg may jerk uncontrollably. Partial seizures are sometimes known as "focal." There are basically three types of partial seizure: simple partial, complex partial, and partial seizures that develop into secondarily generalized seizures.

- In a simple partial seizure, your consciousness is not impaired, but either one limb (or part of a limb) will rhythmically twitch or you will experience unusual tastes or sensations, such as a feeling of "pins and needles," in a distinct part of your body. If a simple partial seizure develops into another type of seizure, it is often called a "warning" or "aura."
- Complex partial seizures differ from partial seizures in that your consciousness is affected. This type of seizure usually begins with a blank or empty stare, and your awareness changes, even though the seizure does not involve convulsions. You may fiddle with clothes or nearby objects, wander around, and generally be confused. This type of seizure usually lasts 2–4 minutes and involves the temporal lobes of the brain, but may also affect the frontal and parietal lobes.
- If either of these types of seizure spreads to involve the whole brain, your seizure is called a secondarily generalized seizure.

What treatments are available?

Your doctor may prescribe a drug called an *antiepileptic drug*, or *anticonvulsant*, used to treat seizures. These drugs are taken every day, sometimes several times a day, for as long as needed. The drugs help control the seizures. There are over two dozen medications for seizures. Common anticonvulsants include Dilantin (phenytoin), Tegretol (carbamazepine), Depakote (valproic acid), and phenobarbital. Several recent medications, such as Lamictal (lamotrigine), Neurontin (gabapentin), Cerebyx (fosphenytoin), Keppra (levetiracetam), and Felbatol (felbamate), have been approved since 1993 for the treatment of seizure disorders. These drugs may be used alone or in combination with each other when seizures are difficult to control.

For friends and family

What to do during a seizure

Most of the time a seizure lasts less than 3 minutes, so by the time an emergency medication is ready to be given, the seizure is over. The most important thing during a seizure is for you to stay calm and protect the person having a seizure.

The following guidelines apply to tonic-clonic seizures (convulsions, grand mal) or complex partial seizures.

1. Cushion the head. Banging the head against a hard surface during a seizure may lead to head trauma. Use any available soft object, and, if needed, use your foot.
2. Loosen tight neckwear to ease breathing.
3. Turn the person onto his/her side. This position helps the tongue fall to the side of the mouth, leaving the airway clear for normal breathing.
4. Do not insert any object into the person's mouth. An object in the mouth will not prevent tongue biting, nor will a person swallow his/her tongue, as some people think. In fact, if an object is placed into the mouth, you may cause more harm by breaking teeth or losing the object in the throat, causing choking.
5. Do not restrain a person during a seizure unless there is a danger. They may become aggressive if you do so. Allow them to do what they want to do. Talk to them in a soft voice to reassure them.

Afterward, tell the person that he/she has had a seizure and make sure they're breathing normal. Check the person's awareness by asking a few questions, such as, "Where are you?" or "What is the day today?" If a tonic-clonic seizure has occurred, inform the doctor.

When to Call 911

1. The seizure lasts longer than 5–10 minutes (status epilepticus). Timing the seizure with a watch is helpful because a brief seizure may seem longer than it really is.
2. Two or more seizures occur together.
3. There are injuries from the seizure.
4. It is the first seizure the person has ever had.
5. The person is pregnant.

If you have any suspicion that something is wrong, **CALL**. It is better to call too frequently than to avoid calling.

Your doctor may prescribe anticonvulsants briefly after you have had brain surgery, head trauma, or a cerebral hemorrhage. If you have no seizures, the dosage of the drug is usually tapered until it is stopped within a short time. However, that time period may vary, based on your condition and specific problem.

As with all drugs there are side effects and drug interactions. Most common side effects include fatigue, drowsiness, nausea, and blurred vision. Also, these drugs may reduce the effectiveness of birth control pills.

What can I do if medications don't control my seizures?

If medications do not control your seizures, then surgery in the portion of the brain responsible for your seizures (e.g., brain resection, disconnection, or stimulation) may treat the condition. If this is the case, you should discuss this option with your doctor (see Epilepsy).

Clinical trials

Clinical trials are research studies in which new treatments—drugs, diagnostics, procedures, vaccines, and other therapies—are tested in people to see if they are safe and effective. Research is always being conducted to improve the standard of medical care and explore new drug and surgical treatments. You can find information about current clinical investigations, including their eligibility, protocol, and participating locations on the web: the National Institutes of Health (NIH), www.clinicaltrials.gov, sponsors many trials; private industry and pharmaceutical companies also sponsor trials. www.centerwatch.com

Current studies

Go to www.mayfieldclinic.com/ClinicalTrials.htm for information about clinical trials conducted by our doctors at local Cincinnati hospitals or call 1-800-325-7787 ext. 5260.

Sources & Links

If you have more questions, please contact the Mayfield Spine Institute at 800-325-7787 or 513-221-1100. Additional information is available on the web.

Sources

www.efa.org
www.epilepsy.com

Glossary

anticonvulsant: a drug that prevents or stops convulsions.

arteriovenous malformation (AVM): a congenital disorder in which there is an abnormal connection between arteries and veins without an intervening capillary bed.

epilepsy: a chronic disorder marked by repeated seizures causing a sudden loss or change of consciousness and convulsions or muscle spasms.

generalized seizure: a seizure involving the entire brain.

partial seizure: a seizure involving only a portion of the brain.

seizure: uncontrollable convulsion, spasm, or series of jerking movements of the face, trunk, arms, or legs.

status epilepticus: a seizure that lasts more than 5 minutes and requires immediate medical attention due to lack of oxygen to the brain.

syncope: a fainting spell caused by an abrupt reduction of blood flow to the brain.

tumor: an abnormal tissue that grows more rapidly than normal tissue; a tumor may be either benign (non-cancer) or malignant (cancer).

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