

### SEIZURES AND EPILEPSY

#### What is Epilepsy?

Epilepsy is a medical condition that produces seizures that affect a variety of mental and physical functions. When a person has two or more seizures, they are considered to have epilepsy.

#### What is a Seizure?

A seizure happens when a brief, strong rush of electrical activity affects part or all of the brain. Seizures can last from a few seconds to a few minutes. They can have many symptoms, from convulsions (jerky muscle contractions) and loss of consciousness to some that are not always recognized as seizures, like blank staring or lip-smacking.

#### Epilepsy vs. Seizures

Seizures are characterized by a sudden change in movement, behavior, sensation or consciousness produced by an abnormal electrical discharge in the brain. Epilepsy is a condition of spontaneously recurring seizures. Having a single seizure does not necessarily mean a person has epilepsy. High fever, severe head injury, lack of oxygen – a number of factors can cause a single seizure. Epilepsy, on the other hand, tends to be a lifelong condition that affects how electrical energy and connections behave in the brain.

#### Generalized Tonic Clonic Seizures

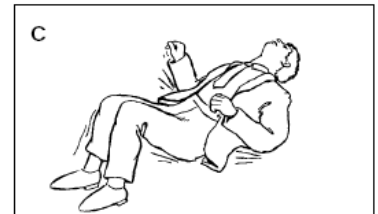
Generalized tonic clonic seizures (grand mal seizures) are the most common and best known type of generalized seizure. They begin with stiffening of the limbs (the tonic phase), followed by jerking of the limbs and face (the clonic phase).

During the tonic phase, breathing may decrease or cease altogether, producing cyanosis (blue color) of the lips, nail beds, and face. Breathing typically returns during the clonic (jerking) phase, but it may be irregular. This clonic phase usually lasts less than a minute.

Some people experience only the tonic, or stiffening phase of the seizure; others exhibit only the clonic or jerking movements; still others may have a tonic-clonic-tonic pattern.

*Figure at right:* A generalized tonic clonic seizure. Here the whole brain is affected from the beginning. In (a) there is a cry and loss of consciousness, arms flex up then extend in (b) and remain rigid (the tonic phase) for a few seconds. A series of jerking movements take place (the clonic phase) as muscles contract and relax together. In (c) the jerking is slowing down and will eventually stop. In (d) the man has been placed on his side to aid breathing and to keep the airway clear.

Incontinence may occur as a result of the seizure. The tongue or inside of the mouth may be bitten during the episode; breathing afterwards may be noisy and appear to be labored. Contrary to popular belief, nothing should be placed in the mouth during the seizure; turning the patient on one side will help prevent choking and keep the airway clear. Following the seizure, the patient will be lethargic, possibly confused, and want to sleep. Headache sometimes occurs. Full recovery takes minutes to hours, depending on the individual.



### First Aid for Generalized Tonic-Clonic Seizures

- Prevent further injury. Place something soft under the head, loosen tight clothing, and clear the area of sharp or hard objects.
- Do not force objects into the person's mouth.
- Do not restrain the person's movements unless they place him or her in danger.
- Turn the person on his or her side to open the airway and allow secretions to drain.
- Stay with the person until the seizure ends.
- Do not pour any liquids into the person's mouth or offer any food, drink, or medication until he or she is fully awake.
- If the person does not resume breathing after the seizure, start cardiopulmonary resuscitation.
- Let the person rest until he or she is fully awake.
- Be reassuring and supportive when consciousness returns.
- A convulsive seizure is usually not a medical emergency unless it lasts longer than five minutes, or a second seizure occurs soon after the first, or the person is pregnant, injured, diabetic, or not breathing easily. In these situations the person should be taken to an emergency medical facility.

### Absence Seizures (also called Petit Mal)

*'Although manifestations of their seizures are usually subtle, children with absence seizures need prompt and effective treatment because their seizures can interfere with learning.'*

Absence seizures (also called petit mal seizures) are lapses of awareness, sometimes with staring, that begins and ends abruptly, lasting only a few seconds. There is no warning and no after-effect.

More common in children than in adults, absence seizures almost always start between ages 4 and 12 years, and rarely do they begin after age 20. Absence seizures are characterized by a brief impairment of consciousness, which usually lasts no more than a few seconds.

The child, whether sitting or standing, simply stares vacantly; neither speaking nor apparently hearing what is said. Then, as abruptly as it began, the impairment lifts and the child continues with his or her previous activity. However, a brief segment of unawareness has been imposed in the stream of activity or thought.

Automatisms may occur in prolonged absence seizures. Absence seizures are frequently so brief that they escape detection, even if the child is experiencing 50 to 100 attacks daily. They may occur for several months or years before the child is sent for a medical evaluation.

## Absence Seizure Characteristics:

- No aura
- Abrupt onset
- Brief duration
- Prompt recovery

Some absence seizures are accompanied by brief myoclonic jerking of the eyelids or facial muscles, or by variable loss of muscle tone. More prolonged attacks may be accompanied by automatisms, which may lead them to be confused with complex partial seizures. However, complex partial seizures last longer, may be preceded by an aura, and are usually marked by some type of confusion following the seizure.

Absence seizures may occur only occasionally or more than 100 times a day. Most children with typical absence seizures are otherwise normal. Although manifestations of their seizures are usually subtle, these children need prompt and effective treatment because absence seizures can interfere with learning. About half the children also have infrequent generalized tonic-clonic seizures. The electroencephalographic (EEG) pattern of diffuse spike-wave is closely correlated with absence seizures.

*Figure on right: EEG showing generalized 3Hz spike and wave discharges in a patient having an absence seizure.*



Absence seizures are often confused with complex partial seizures. This is an unfortunate mistake because the drugs that prevent absence seizures have little or no effect on complex partial seizures. Conversely, the most effective drugs for complex partial seizures are either ineffective against or increase the frequency of absence seizures.

Although absence and complex partial seizures can be confused, they have distinct differences. First, absence seizures are never preceded by an aura. Second, absence seizures are of briefer duration – seconds rather than minutes. Third, absence seizures begin frequently and end abruptly. Finally, the absence attack is always associated with the strikingly typical EEG abnormality of spike and slow wave discharges, usually at a frequency of 3Hz. These discharges can occur interictally and ictally and are often provoked by hyperventilation.

## What to Do:

No first aid is necessary, but if this is the first observation of an absence seizure, medical evaluation is recommended.

### Partial Seizures

In partial seizures the electrical disturbance is limited to a specific area of one cerebral hemisphere (side of the brain). Partial seizures are subdivided into **simple partial seizures** (in which consciousness is retained); and **complex partial seizures** (in which consciousness is impaired or lost). Partial seizures may spread to cause a generalized seizure, in which case the classification category is partial seizures secondarily generalized.

Partial seizures are the most common type of seizure experienced by people with epilepsy. Virtually any movement, sensory, or emotional symptom can occur as part of a partial seizure, including complex visual or auditory hallucinations.

Type	Duration	Seizure Symptoms	Postictal (post-seizure) Symptoms
Simple Partial	90 seconds	No loss of consciousness. Sudden jerking sensory phenomena	Possible transient weakness or loss of sensation
Complex partial	1 to 2 minutes	May have aura Automatisms (such as lip smacking, picking at clothes, fumbling) Unaware of environment May wander	Amnesia for seizure events Mild to moderate confusion sleepy

### Key Things to Remember about Partial Seizures

Although partial seizures affect different physical, emotional, or sensory functions of the brain, they have some things in common:

- **They don't last long.** Most last only a minute or two, although people may be confused and need a lot more time afterwards to recover fully.
- **They end naturally.** Except in rare cases, the brain has its own way of bringing the seizure safely to an end after a minute or two.
- **You can't stop them.** In an emergency, doctors may use drugs to bring a lengthy, non-stop seizure to an end. However, the average person should wait for the seizure to run its course and try to protect the person from harm while consciousness is clouded. People who have been shown how to use a Vagus Nerve Stimulator (VNS) magnet may try to stop a partial seizure in that way.
- **They are not dangerous to others.** The movements produced by a seizure are almost always too vague, too unorganized and too confused to threaten the safety of anyone else.

### Non-epileptic Seizures

Non-epileptic seizures are episodes that briefly change a person's behavior and often look like epileptic seizures. The person having non-epileptic seizures may have internal sensations that resemble those felt during an epileptic seizure. The difference in these two kinds of episodes is often hard to recognize by just watching the event, even by trained medical personnel.

But there is an important difference. Epileptic seizures are caused by abnormal electrical changes in the brain and, in particular, in its outer layer, called the cortex. Non-epileptic seizures are not caused by electrical disruptions in the brain.

### Status Epilepticus

Most seizures end after a few moments or a few minutes. If seizures are prolonged, or occur in a series, there is an increased risk of status epilepticus. The term literally means a continuous state of seizure.

### WANT MORE INFORMATION?

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