

**Brain Injury and  
General Rehabilitation  
Information Series**

**MEDICAL ISSUES  
Seizures**

A Service of  
Santa Clara Valley Medical Center



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# **Seizures— What You Should Know**

**INSIDE:**

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**What happens during a seizure?**

**Is it dangerous to have a seizure?**

**What can a person do to reduce the risk of seizures?**

**What kind of first aid can be given?**

**What medications are there?**

**What should I know about seizure medications?**

**Disclaimer:**

This information in this booklet is not meant to replace the advice of a medical doctor. Persons should consult qualified physicians regarding specific medical concerns or treatment.

For more information or to schedule a SCVMC Clinic appointment, call 408 885-5920

## What Are Seizures?

A seizure occurs when a particular area of the brain fires spontaneously without voluntary control. They can occur as a result of brain trauma, brain tumors or infections, strokes and metabolic disturbances (alcohol or drug withdrawal, severe body chemistry disorders). It can result in an unexpected sensation (visual image, smell, sound, feeling or taste), motor activity (head, eyes, or limb shaking), and/or change in alertness, ability to speak or understand. During a seizure, it is impossible for the person to voluntarily stop this activity even if they are awake and alert.

A *partial seizure* is one that stays in one part of the brain and results in the loss of use of one part of the body. If it spreads to other areas or the person loses consciousness, it becomes a *complex partial or generalized seizure*. A *petit mal seizure* is a partial seizure that results in brief loss of awareness, without muscle contractions. A *grand mal seizure* is one where the person immediately loses consciousness and may have *tonic movements* (stiffening of muscles), *clonic movements* (rhythmic jerking of muscles) or loss of ability to move. If the seizure does not stop, it is called *status epilepticus* and becomes an emergency because the person may stop breathing, be unable to control their airway and break down muscle. When a person has had recurrent seizures, the condition is called epilepsy. There are many conditions that are associated with epilepsy. Some of the most common are trauma, stroke, brain tumors, brain abscesses, anoxia, and degenerative conditions.

**IMPORTANT: If the person does not stop seizing or does not awaken between multiple seizures, call 911 IMMEDIATELY.**

Most seizures last only seconds to minutes. Loss of bowel or bladder control or tongue-biting may accompany a seizure. After a seizure, the person may be drowsy, weak, confused or have difficulty speaking. This may last from a few minutes to several days.

## **During a seizure any of the following can occur:**

- 1) unexpected sensations such as a visual images or numbness
- 2) unusual smells, sounds, feelings or tastes
- 3) uncontrolled motor activity—eye movements, facial movements, tongue biting, head or limb shaking
- 4) sudden loss of ability to speak or understand conversation
- 5) sudden change in alertness or attentiveness
- 6) a blank appearance on the face
- 7) loss of bladder or bowel control
- 8) sudden falls from loss of motor control

If the person remains alert, they will not be able to stop this activity. An observer would also not be able to stop it.

## **Is it dangerous to have seizures?**

If you are driving, walking, or eating when a seizure occurs, you could get hurt or hurt someone else. You need to be seizure-free for at least 3 months and be certified to be safe by a physician and the DMV in order to resume driving. A seizure that occurs during the first week after a TBI or in the first few days after a brain operation is less likely to re-occur (25-30%) than a seizure that occurs after the first week (over 80%). *Recurrent* seizures can cause further injury and brain damage.

If you have even one seizure, you must report yourself and your physician must report you to the DMV. Once you have been seizure-free for at least 3 months, you may reapply to the DMV for reinstatement.

## What can a person do to decrease the risk of seizures?

- Avoid extreme fatigue.
- Treat anything that may cause a high fever.
- Do not drink alcohol: beer, wine, and liquor
- Avoid dehydration
- Avoid low blood sugar, especially if one has diabetes mellitus
- Do not use drugs that increase the likelihood of having a seizure: *amphetamines, cocaine, ecstasy, or marijuana*. It does not matter how these drugs are taken. Any one of them can cause a seizure.

For any prescribed drug ask your doctor or pharmacist if the medication is associated with seizures. Certain medications can increase your chance of experiencing a seizure, especially after a brain injury



## First Aid for Seizures

Observe what happens to the person so you can help the treating health care providers determine what happened. These observations are the most useful information to physicians in determining whether the observed behavior is actually a seizure and what type. Try to remember what happened first and later on, how long the episode lasts, what the person was able to do or say afterwards.

To prevent the person from hurting themselves during the seizure:

- 1) Loosen tight clothing, especially around the neck
- 2) If a person is sitting in a chair or laying in bed, hold them so they won't fall
- 3) If standing, help them to the ground
- 4) Turn their head and body to the side so that anything in the mouth, even saliva, does not block the airway. A person cannot swallow their tongue, but the tongue can obstruct breathing
- 5) Call for help. If you call the physician, have a record of the person's medications, including dose and frequency when calling.
- 6) If the person stops breathing or the seizure does not stop after 3-4 minutes or they don't become alert after the seizure, **CALL 911.**
- 7) Do NOT try to feed the person who has just had a seizure. They may vomit or have another seizure, which could cause them to aspirate.
- 8) Do NOT try to put anything in their mouth. You may get bitten.

## **EEG (electroencephalogram)**

This is a test where brainwaves are recorded from electrodes placed all over the scalp. It is often helpful to be both awake and asleep during this test. It can sometimes detect seizure activity in the brain when it is not obvious to an observer or a physician that an actual seizure has occurred. Often the findings from an EEG are not specific for an actual seizure event and serial EEG tests or continuous EEG monitoring with video cameras is necessary to diagnose a seizure disorder.

## **Are there medications?**

Antiepileptic medications (AEDs) are often used to prevent or treat seizures for any of the above conditions. All medications, including AEDs have side effects, some of which may be more problematic than the risk for seizures. Seizure risk changes over time after a brain injury. The highest risk for seizures is during the first week after a TBI, so medications are routinely given to prevent an early seizure; they may not be indicated after the first week. For other conditions such as brain tumors, there may be an increased risk for seizures over time. Since you are the one taking the medication and living with the consequences of having a seizure, it is very important for you to make an informed decision with your physician regarding the need for taking AEDs and choosing the medication that would be best for you. It is extremely important to work closely with your physician regarding the dosing and monitoring of AEDs. Overdoses can be dangerous.

# Common Antiepileptic Medications (AEDs)

Some of the more commonly used medications for control of seizures are listed below with their advantages and disadvantages. *Each has been associated with birth defects, so continued use during the first 20 weeks of pregnancy must be evaluated carefully by the patient and her treating physicians.*

*Unless otherwise noted, AEDs affect the metabolism of other drugs, especially those metabolized in the liver. Therefore, it is best to try to control seizures using **ONE** medication. However, if one medication is insufficient, “add-on” drugs can be used.*

\* indicates that blood levels of the medications are readily available. Drug levels are most helpful to find out how much medication is in your body or if you are experiencing side effects. You and your physician will have to find the dose of medication that is best for you. It may or may not be in the “therapeutic” drug level range. Most side effects or toxicities can be monitored with routine blood tests.

PO = by mouth; IV = by vein.

## **\*Phenytoin (Dilantin) and fosphenytoin (Cerebyx)**

Available in IV, extended release capsules, tablets, liquid

*Advantages:* partial or generalized seizures, once/day dosing for capsules, can be loaded PO or IV

*Disadvantages:* small dose increases can cause toxicity at high doses, gum tissue growth demands daily gum care, facial hair growth, slowed thinking, rashes in 20% of users, facial feature changes in nose and jaw, impaired balance, bone weakness.

*Toxicity:* Liver and blood cell production.

**\*Carbamazepine (Tegretol, Tegretol XR, Carbatrol)**

Available in tablets, liquid, capsules

*Advantages:* partial or generalized seizures. May stabilize mood, outbursts, agitation, tremor

*Disadvantages:* 2-3 x / day dosing, impaired balance, double vision, mild slowed thinking, rashes.

*Toxicity:* blood cell production, liver, blood chemistry disturbance

**\*Valproic acid/ divalproex sodium (Depakene, Depakote, Depakote ER)**

Available in tablets, capsules, sprinkles, liquid, IV

*Advantages:* petit mal, generalized, some partial seizures. May stabilize mood, outbursts and decrease migraine headaches. Less sedating.

*Disadvantages:* 2-3 x / day dosing. Weight gain, hair loss.

*Toxicity:* Liver, pancreas and blood cell production.

**\*Phenobarbital**

Available in tablets, liquid, IV

*Advantages:* Partial or generalized seizures. 1x/ day dosing

*Disadvantages:* Most sedating, slowed thinking, withdrawal seizures, rashes, drug interactions.

*Toxicity:* blood cell production.

**\*Lorazepam (Ativan)**

Available in tablets, liquid, IV

*Advantages:* status epilepticus; fastest at stopping seizures, decreases anxiety

*Disadvantages:* 3-4 x /day dosing, sedating, slowed thinking, memory lapses, anti-seizure effect short lasting, habit-forming, withdrawal seizures

### **\*Clonazepam (Klonopin)**

Available in tablets

*Advantages:* generalized seizures, decreases anxiety, tremor

*Disadvantages:* sedating, slowed thinking, memory lapses, habit-forming, withdrawal seizures

### **Gabapentin (Neurontin)**

Available in tablets, multiple doses

*Advantages:* partial seizures, add-on drug, few interactions, helps burning nerve pain

*Disadvantages:* sedating, weight gain, dose adjustment with kidney disease.

*Toxicity:* white blood cell production.

### **Lamotrigine (Lamictal)**

Available in tablets

*Advantages:* generalized or partial seizures, Lennox-Gastaut syndrome, less sedation and slowed thinking, stabilizes mood

*Disadvantages:* Very slow increase in dose to avoid rashes, so may have another seizure before correct dose is reached. Weight gain.

*Toxicity:* Liver, kidney and blood cell production.

### **Levetiracetam (Keppra)**

Available in tablets

*Advantages:* partial or generalized seizures; Very few interactions; good add-on AED, least sedating, decrease myoclonus. Can increase dose quickly

*Disadvantages:* can increase agitation, dose adjustment with kidney disease, rashes.

*Toxicity:* blood cell production

## **Oxcarbazepine (Trileptal)**

Available in tablets, liquid

*Advantages:* partial or generalized seizures. Less sedating, fewer side effects than carbamazepine, can help burning nerve pain. No warfarin interaction.

*Disadvantages:* 2x/day dosing, rashes.

*Toxicity:* blood chemistry and cell production

## **Tiagabine (Gabitril)**

Available in tablets

*Advantages:* partial seizures, very few interactions, may stabilize mood

*Disadvantages:* 2-4 x /day dosing, sedating

## **Topiramate (Topamax)**

Available in tablets

*Advantages:* Add on treatment for partial, generalized seizures. Once/day dosing

*Disadvantages:* Slow increases in dose, so may have seizure before therapeutic dose reached; vision problems.

*Toxicity:* Kidney, liver, and blood cell production.

## **Zonisamide (Zonegran)**

Available in tablets

*Advantages:* partial seizures, once/day dosing

*Disadvantages:* slow increases to therapeutic dose, sedating, headache.

*Toxicity:* blood cell production

# For More Information

## **The Epilepsy Foundation of America**

Phone: 1-800-332-1000

Web: [www.efa.org](http://www.efa.org)

## **National Library of Medicine**

Web: [www.nlm.nih.gov/medlineplus/seizures.html](http://www.nlm.nih.gov/medlineplus/seizures.html)

Interactive Tutorial:

[www.nlm.nih.gov/](http://www.nlm.nih.gov/)

[medlineplus/tutorials/seizuresandepilepsyloader.html](http://medlineplus/tutorials/seizuresandepilepsyloader.html)

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