

# Seizures After Traumatic Brain Injury

June 2020

[www.msktc.org/tbi/factsheets](http://www.msktc.org/tbi/factsheets)

TBI Factsheet

This factsheet provides information about seizures after TBI. It also discusses treatment for seizures.

Seizures are one health problem that can occur after a traumatic brain injury (TBI). Although most people with a TBI will never have a seizure, 1 out of 10 people who were hospitalized after a TBI will have seizures. It's good to know what a seizure is and what to do if you have one. Most seizures happen in the first few days or weeks after a TBI. But some may occur months or even years after the injury. About 70% to 80% of people who have had a TBI and who then have seizures are helped by medicine and can return to most activities. In rare cases, seizures can make it harder for a person with a TBI to function because of new difficulties with thinking or moving.

## What are seizures?

A seizure is sudden and abnormal electrical activity in the brain. During a seizure, one or more of the following symptoms may occur:

- Unusual movement of the head, body, arms, legs, or eyes. This may include stiffening, jerking, or shaking.
- Unresponsiveness and staring.
- Chewing, lip smacking, or fumbling movements.
- Changes in sense of smell, hearing, or taste.
- Changes in vision, such as an aura or seeing things that aren't there.
- Sudden tiredness or dizziness.
- Not being able to speak or understand others.
- New outbursts of anger or tearfulness.

The Traumatic Brain Injury Model Systems program is sponsored by the National Institute on Disability, Independent Living, and Rehabilitation Research, Administration for Community Living, U.S. Department of Health and Human Services. (See <http://www.msktc.org/tbi/model-system-centers> for more information).

These symptoms of a seizure happen suddenly, and you can't control them. Seizures usually last a few seconds or minutes but can last for 5 to 10 minutes. During a seizure, you may have a bladder or bowel accident; you may bite your tongue or the inside of your mouth. After a seizure, you may feel drowsy, weak, or confused or have a hard time talking to or understanding others. After a severe seizure, which lasts longer than 2 minutes, it may be hard for you to stand, walk, or take care of yourself for a few days or even longer.

Some conditions that may increase the risk of having a seizure include:

- High fever.
- Loss of sleep and extreme fatigue.
- Drug and alcohol use.
- Chemical changes in the body such as low sodium or magnesium or high calcium.

## What do we call seizures after TBI

- A seizure that occurs within 1 week of a TBI is called an early posttraumatic seizure. About 25% of people who have an early posttraumatic seizure will have another seizure months or years later. This is called epilepsy.
- A seizure that occurs more than 1 week after a TBI is called a late posttraumatic seizure. About 80% of people who have this kind of seizure will have another seizure (epilepsy).
- Half of all people who develop epilepsy will continue to have seizures throughout their lives, but they can usually be managed with medications.

## Medicine to treat seizures

Medicines used to control seizures are called antiepileptic drugs (AEDs). AEDs may be used for other problems, such as chronic pain, restlessness, or mood instability. You and your doctor will decide which drug to use based on the type of seizures you have, your age, how healthy you are, and if you have side effects from the medicine. Side effects from AEDs often improve after you've been taking the medicine for 3 to 5 days.

Some common side effects of AEDs are:

- Sleepiness or fatigue.
- Worsening balance.
- Lightheadedness or dizziness.
- Trembling.
- Double vision.
- Confusion.

You may need to have blood tests to make sure you are getting enough medicine and to make sure the AED isn't causing other problems. Although AEDs rarely cause birth defects in newborns, you should tell your doctor if you are pregnant or may become pregnant. Sometimes your doctor will prescribe two or more AEDs to stop your seizures. Some common AEDs are listed below.

- Carbamazepine (also known as Tegretol).
- Lamotrigine (also known as Lamictal).
- Levetiracetam (also known as Keppra).
- Gabapentin (also known as Neurontin).
- Oxcarbazepine (also known as Trileptal).
- Phenobarbital.
- Phenytoin/fosphenytoin (also known as Dilantin).

- Pregabalin (also known as Lyrica).
- Topiramate (also known as Topamax).
- Valproic acid or valproate (also known as Depakene or Depakote).
- Zonisamide (also known as Zonegran).

### What if medicine doesn't work?

Anti-seizure medicines usually work. But sometimes they can't stop your seizures. If you still have seizures after trying medicine, your doctor may send you to a comprehensive epilepsy center. At the center, you will see special seizure doctors called epileptologists or neurologists who specialize in epilepsy. These doctors may do brain wave tests and take a video of you during one of your seizures to help figure out what's causing them. This information may help your doctor decide what medicine will work best. It may also help the doctor figure out if other types of treatment will help with the seizures you are having.

To find a center near you, you can visit the websites of the Epilepsy Foundation ([www.efa.org](http://www.efa.org)) and the American Epilepsy Society ([www.aesnet.org](http://www.aesnet.org)).

### Safety issues

In most states, if you have had a seizure, you can't drive, and you must notify the department of motor vehicles. Usually you won't be able to drive for a certain period of time, or until your seizures have stopped. The laws vary from state to state.

If you are still having seizures, you should take certain steps to stay safe.

- Talk to your doctor about your seizure risk based on your type of injury, your medical status and how long it has been since your injury.
- People with seizures should not drink alcohol or use marijuana because this will increase your risk for another seizure.
- After a seizure you should not operate heavy equipment until you meet with your doctor.
- Always have someone with you when you are in water. This includes pools, lakes, oceans, and bathtubs.
- Don't climb on ladders, trees, roofs, or other tall objects.
- When eating, tell the people with you what to do if you have a seizure and start choking.

### What your caregiver should do if you are having a seizure

Family members and caregivers should watch closely during a seizure so they can describe what happened to your doctor and other health care providers. They should make a diary with the date, time of day, length of time, and a description of each seizure. Your doctor will need this information, along with the medicines you are taking to control your seizures. Most seizures are short and don't cause serious injuries. But it's important for your caregivers to know what to do to keep you from hurting yourself during a seizure.

When someone is having a seizure, do the following:

- Loosen tight clothing, especially around the neck.
- Make sure the person doesn't fall. Hold the person steady if he or she is in a chair, couch, or bed. If the person is standing, get him or her to the ground safely.
- Turn the person and his or her head to the side so that anything in the mouth, even spit, doesn't block the throat.
- Don't put anything in the person's mouth as you may get bitten.
- If you know cardiopulmonary resuscitation (CPR), check the heartbeat in the neck. Start CPR if there is no pulse. Call 911.
- Listen for breathing at the mouth. Extend the person's neck if breathing is difficult. If the person isn't breathing, start CPR. Seal your lips over the person's mouth and breathe two quick breaths. Continue breathing every 5 seconds unless the person starts breathing on his or her own. Call 911.
- If this is the first seizure after a TBI, call the person's doctor for advice.
- If the seizure doesn't stop after 3 minutes, call 911.
- If the seizure stops within 3 minutes, call the person's doctor.
- If the person doesn't return to normal within 20 minutes after the seizure, call 911.

## For More Information

The Epilepsy Foundation

Phone: 1-800-332-1000

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

American Epilepsy Society

Phone 1-312-883-3800

Website: [www.aesnet.org](http://www.aesnet.org)

Brain Injury Association of America

Phone: 1-800-444-6443

## References

Brain Trauma Foundation & American Association of Neurological Surgeons, Joint Section on Neurotrauma and Critical Care. (2000). The role of antiseizure prophylaxis following head injury. In: *Management and prognosis of severe traumatic brain injury* (pp. 159–165). Palo Alto, CA: Brain Trauma Foundation.

Englander, J., Bushnik, T., Duong, T. T., Cifu, D. X., Zafonte, R., Wright, J., . . . Bergman, W. (2003). Analyzing risk factors for late posttraumatic seizures: A prospective, multicenter investigation. *Archives of Physical Medicine and Rehabilitation*, 84(3), 365–373.

Gupta, P. K., Sayed, N., Ding, K., Agostini, M. A., Van Ness, P. C., Yablon, S., . . . Diaz-Arrastia, R. (2014). Subtypes of post-traumatic epilepsy: Clinical, electrophysiologic, and imaging features. *Journal of Neurotrauma*, 31(16), 1439–1443.

Yablon, S. A., & Towne, A. R. Post-traumatic seizures and epilepsy. In N. D. Zasler, D. I. Katz, R. D. Zafonte, D. B. Arciniegas, M. Ross Bullock, & J. S. Kreutzer, (Eds.), *Brain injury medicine: Principles and practice* (2nd ed.). New York, NY: Demos Medical.

## Authorship

*Seizures After Traumatic Brain Injury* was originally developed by Jeffrey Englander, MD, David X. Cifu MD, Ramon Diaz-Arrastia MD, and Alan Towne, MD in collaboration with the University of Washington Model Systems Knowledge Translation Center (MSKTC). Website: [www.biausa.org](http://www.biausa.org)

## Factsheet Update

*Seizures After Traumatic Brain Injury* was reviewed and updated by David X. Cifu MD, Ramon Diaz-Arrastia MD, and Alan Towne, MD, in collaboration with the American Institutes for Research Model Systems Knowledge Translation Center.

**Source:** The content in this factsheet is based on research and/or professional consensus. This content has been reviewed and approved by experts from the Traumatic Brain Injury Model Systems (TBIMS), funded by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR), as well as experts from Polytrauma Rehabilitation Centers (PRCs), with funding from the U.S. Department of Veterans Affairs.

**Disclaimer:** This information is not meant to replace the advice of a medical professional. You should consult your health care provider regarding specific medical concerns or treatment. This publication was produced by the TBI Model Systems in collaboration with the University of Washington Model Systems Knowledge Translation Center with funding from the National Institute on Disability and Rehabilitation Research in the U.S. Department of Education, grant no. H133A060070. It was updated under the American Institutes for Research Model Systems Knowledge Translation Center, with funding from the National Institute on Disability Independent Living, and Rehabilitation Research (NIDILRR grant number 90DP0082). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this factsheet do not necessarily represent the policy of NIDILRR, ACL, or HHS, and you should not assume endorsement by the federal government.

**Copyright** © 2020 Model Systems Knowledge Translation Center (MSKTC). May be reproduced and distributed freely with appropriate attribution. Prior permission must be obtained for inclusion in fee-based materials. Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR; grant number 90DP0082).

