

Carpe Diem – Seize the Day Blog

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Let's take a look at focal (partial) seizures in this week's blog. We examine focal onset seizures, including types and subtypes, causes, symptoms, prevention tips, and treatments.

A focal onset seizure starts on one side of the brain. You may or may not be aware it is happening. Symptoms are typically mild. You may experience odd sensations, twitching, staring, or an inability to move or respond to your environment. These seizures last less than 2 minutes. If you have recently been diagnosed with focal onset seizures, know that living with a seizure disorder is often manageable.

A seizure is “episodic, excessive, and disorderly” brain activity. A focal onset seizure is a seizure that involves one side of the brain. It used to be called a partial seizure.

There are three classes of seizures:

- generalized onset, which involves both sides of the brain
- focal onset, which involves one side of the brain
- unknown onset, which is a seizure that cannot be classified as generalized onset or focal onset

Neurologists further classify focal onset seizures as aware or impaired awareness and motor and nonmotor.

- Focal onset aware seizure

In a focal onset aware seizure, you are fully aware of what you are experiencing and where you are during the seizure. This can happen even if you are unable to move. The former name for it is a simple partial seizure. If you lack awareness at any point during the seizure, a doctor would classify it as a focal onset impaired awareness seizure.

- Focal onset impaired awareness seizure

A focal onset impaired awareness seizure means you are not aware during the seizure. You may become dazed, confused, and unable to respond for several minutes. You may lose consciousness. The former name is complex partial seizure.

Doctors classify focal onset seizures as motor or nonmotor onset by certain features and characteristics:

- **Motor onset seizure:** These seizures involve the motor cortex of the brain, which controls movement. There is an increase or decrease in muscle activity. Doctors may describe motor onset seizures as simple or complex depending on the movements. Some of the many types of motor onset seizures include:
 - focal clonic seizure, marked by repetitive and rhythmic movements like jerking of the leg on one side of the body that may spread up or down along one side of the body
 - focal myoclonic seizure, marked by a single or brief cluster of jerking movements

- focal tonic seizure, marked by stiffness due to increased muscle tone
- focal motor seizure with dystonia, marked by muscle contractions leading to unusual twist-like positions
- focal atonic seizure, marked by loss of muscle tone and limpness of a body, such as the head, neck, or limbs
- focal motor seizure with paresis/paralysis, marked by weakness or paralysis
- focal hyperkinetic seizure, marked by action movements like pedaling or jumping
- focal automatism seizure, marked by coordinated but repetitive behaviors like lip smacking, tapping, and making sounds, among many other possible behaviors
- focal motor seizure with dysarthria or anarthria, marked by difficulty articulating your speech due to a lack of motor coordination of the muscles involved in speech
- **Focal sensory seizure:** These seizures affect various sensory areas of the brain. Symptoms may include numbness, tingling, a crawling sensation, and a pins-and-needles feeling. Other types of focal sensory seizures involve visual, auditory (hearing), olfactory (smell), or gustatory (taste) experiences depending on the part of the brain affected. Another person observing you may not realize you are having this type of seizure.
- **Focal autonomic seizure:** These seizures involve a part of the brain involved in the body's involuntary functions — the autonomic nervous system. This type of seizure is harder to diagnose, as you will experience nonspecific symptoms like shivering, nausea, and changes in blood pressure.
- **Focal cognitive seizure:** These seizures involve a reduction or enhancement of cognitive function, such as the ability to think, remember, and process information. Symptoms can range from memory problems and déjà vu to an inability to read or write.
- **Focal emotional seizure:** These seizures involve changes in mood or emotions, such as laughing, crying, pleasure, fear, and anger. The seizure can trigger emotions from the past. The former name for this seizure is psychic seizure.

Although a focal onset seizure starts on one side of the brain, it can spread around the brain and involve both halves. You can lose consciousness. This type of seizure used to be known as a secondary generalized seizure.

What does a focal onset seizure feel like? The symptoms of a focal seizure vary considerably from person to person and in each seizure event depending on the part of the brain the seizure involves. Refer to the Types of focal onset seizures for a more thorough explanation. Briefly, symptoms can include:

- unusual sensations of sight, smell, touch, taste, or hearing
- a sense of déjà vu
- repetitive movements on the same side of the body
- speech you cannot control
- spontaneous emotions or behaviors such as crying

You may be completely awake, alert, and able to remember the events during a focal onset aware seizure. However, some people report feeling as if they are frozen. You may not be able to respond to questions or acknowledge others. Focal onset seizures are most commonly brief, lasting no more than 2 minutes.

After a focal onset seizure, you usually resume what you were doing before it. You may or may not remember having the seizure. A focal onset seizure can be a warning sign that a more substantial seizure may occur with loss of consciousness.

If this is a first-time seizure, you should seek medical attention for an evaluation. Also seek medical attention if multiple seizures occur, if the seizure lasts more than 5 minutes, or if you experience other symptoms along with the seizure, such as fever. You may also need first aid for any injuries if it was a motor onset seizure.

How often you have a focal onset seizure will differ between people and is unpredictable. You may have only one seizure, or it may happen repeatedly. Your doctor will need to know the frequency of your seizure episodes to accurately diagnose your condition or rule out another illness.

Sometimes you and your doctor will not be able to detect an underlying reason for a seizure. This is called an idiopathic seizure.

Possible underlying causes of focal onset seizures include:

- blood vessel problems in the brain
- brain infection such as meningitis
- brain injury, including due to trauma or lack of oxygen
- brain anomaly you were born with
- brain tumor
- stroke
- electrolyte imbalance
- genetic condition
- immune conditions

A trigger is something that often occurs right before your seizure. The best way to determine your triggers is to record the things happening right before your seizures. For example, you could mention “forgot to eat lunch.” More ideas will emerge as you write them down. Specific seizure triggers, not limited to the focal onset type, can include:

- stress
- alcohol intoxication or withdrawal
- illicit drug use
- lack of sleep
- fever
- low blood sugar
- hormone changes related to menstrual cycle
- missed medication
- bright lights
- illness
- nutritional deficiencies

If you have had more than one unprovoked focal seizure, it is possible you have epilepsy. “Unprovoked” means it was not caused by an illness, such as an electrolyte imbalance, fever, or low blood sugar

Your doctor will complete a medical history and physical exam to diagnose a focal onset seizure and determine its underlying cause if possible. Your doctor will likely want you to have an electroencephalogram (EEG). An EEG shows electrical activity in the brain. This may help with diagnosis, but it is not always conclusive because it may not show seizure activity. You may need a more comprehensive evaluation at a specialized epilepsy center.

Your doctor may request an MRI scan or CT scan to determine whether an underlying structural cause exists for the seizures.

Your doctor will consider your physical exam, symptom history, and test results to determine whether your symptoms could be caused by another health condition. Other health conditions may include:

- nausea or pain from stomach disorders
- numbness or tingling from a pinched nerve
- hallucinations from a psychiatric disorder
- numbness in a limb or on the face from a transient ischemic attack, which is a mild stroke
- migraine that produces visual symptoms, tingling sensations, or other symptoms confused with a seizure

Your doctor will be able to narrow down your diagnosis if you share your full personal and family medical history.

What are the available treatment options for focal onset seizures? Focal onset seizures are treatable. If another condition is causing them, they may go away after treating the illness.

Treatment options depend on the diagnosis. If your doctor suspects you have a form of epilepsy, you will likely need to work with a doctor known as a neurologist. The treatments to manage seizures are:

- **Antiseizure medication:** Medication is all that is necessary to manage seizures for approximately 7 out of 10 people.
- **Neuromodulation devices:** An implantable device that sends electrical currents to the nervous system can help reroute electrical signals and prevent seizures. The main idea behind this device is to make the brain cells perform in their usual manner.
- **Surgery:** This may be an option for people with seizures that are resistant to medication.
- **Dietary therapy:** Your doctor may recommend diet modifications. The four main diets to help control seizures are:
 - ketogenic diet
 - modified Atkins diet
 - low glycemic diet
 - medium chain triglyceride diet

Your doctor will provide you with guidance for diet modifications.

Are focal onset seizures harmful without treatment? Focal onset seizures can be dangerous depending on the subtype and other circumstances, such as if you are driving at the time. You could fall and hurt your head during a seizure. Treatment can help reduce the number of seizures but may not eliminate them entirely. Untreated seizures can lead to cognitive issues, which can

include difficulty thinking, remembering, and paying attention. Rarely, seizures can lead to sudden death. Sudden death in epilepsy (SUDEP) is when a person dies unexpectedly, with or without evidence of a seizure.

You can live well with a seizure condition. Treatment and planning can help. Tips include:

- Learn about your condition and what to expect. Stay connected with your healthcare team and tell them if something about your symptoms or treatment does not feel right.
- Take your medication as directed by your physician.
- Have a seizure action plan, which is a written document your loved ones and others can refer to so that they understand your seizures and know what to do in the event of an emergency. Your seizure action plan should also list the medications you take.
- Prepare your home by removing safety hazards such as loose rugs and sharp corners.
- Make lifestyle adjustments as your doctor recommends, which may include:
 - diet modification
 - stress reduction
 - regular sleep schedule
- Talk with your doctor about vitamin supplements (vitamins B, E, and D).
- Avoid overstimulation (bright light, sunlight, computer games, TV), as this can sometimes trigger seizures.

Focal onset seizures vary in intensity and frequency. For this reason, your doctor is the best person to ask about your individual outlook. Managing your seizures closely is beneficial for your long-term health.

Factors that may affect your outlook include:

- family health history
- infections
- preexisting neurological conditions such as brain tumor
- cardiac and vascular diseases such as stroke or heart disease

In summary, focal onset seizures are those that begin on one side of the brain. Symptoms vary considerably but can include odd sensations and repetitive movements. Some people lose awareness and may lose consciousness during a focal onset seizure. A focal onset seizure can also progress to a generalized seizure.

It is possible to manage seizure frequency and have a fulfilling life with a seizure disorder involving focal onset seizures. Take care of your overall health and develop a seizure action plan with your doctor. This can include informing your community of your seizure plan, wearing an emergency bracelet, and keeping your home clutter-free.

Editor's Note: The Carpe Diem – Seize the Day Blog will be distributed and posted weekly.
Always remember – **CARPE DIEM – SEIZE THE DAY!**

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