

Carpe Diem – Seize the Day Blog

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Let's examine frontal lobe epilepsy in this week's blog. Frontal lobe epilepsy causes seizures that begin in the part of the brain responsible for movement, personality, and planning. In most cases, there is no known cause, but possible factors include traumatic brain injuries, stroke, and nervous system infections.

Around 1.2% of the total United States population lives with epilepsy, and frontal lobe epilepsy is one of the most prevalent forms of the condition. It is the second most common type of focal epilepsy. Doctors treat the condition with a combination of medication and diet changes and, in some instances, surgery or neuromodulation.

What are frontal lobe seizures? Epilepsy is a neurological disorder that makes the brain have bursts of abnormal activity, causing seizures. According to the American Association of Neurological Surgeons (AANS), there are two categories of epileptic seizures: primary generalized seizures and partial seizures (also called focal seizures).

A frontal lobe seizure is a partial seizure because it starts in one part of the brain — the frontal lobe. This is the part of the brain responsible for producing speech and language, forming memories, understanding others, and more. Because of this, frontal lobe seizures can significantly impact a person's quality of life.

What causes of frontal lobe epilepsy? About 20–40% of all cases of epilepsy are idiopathic, according to 2003 research. This means they happen for no apparent reason, and doctors cannot determine a cause. While some instances of frontal lobe epilepsy are idiopathic, others have known causes. These include:

- traumatic brain injury
- genetics
- stroke
- infection
- brain abnormality present from birth
- brain tumor

The AANS highlights certain factors that increase the likelihood of a seizure in a person who has epilepsy. These include:

- stress
- sleep deprivation
- fatigue
- hunger
- alcohol

- drug misuse
- difficulty taking medication for epilepsy on schedule

Frontal lobe epilepsy symptoms can vary from person to person and can differ depending on which part of the frontal lobe the seizures affect. An individual's seizures will typically have consistent symptoms, but sometimes they may occur with new or different symptoms. These may indicate a change in brain activity or a potential problem.

Frontal lobe seizures are often brief. Symptoms may include:

- jerking on one side of the body
- stiffness or twitching
- a “wave” feeling going through the head
- lack of responsiveness
- urinary incontinence

Doctors typically treat frontal lobe epilepsy with medication, surgery, and neuromodulation. In some cases, they may also recommend dietary changes. A doctor may prescribe antiepileptic drugs (AEDs) such as oxcarbazepine. According to the AANS, up to 70% of people with epilepsy can manage their seizures with AEDs. If a person does not respond to medication, diet or surgery may help their symptoms.

If medication does not work, a doctor may recommend neuromodulation therapy for seizures. This involves stimulating parts of the brain to change the activity of brain cells. Types of neuromodulation include:

- Vagus nerve stimulation: A doctor implants a device under the skin on the chest and threads a wire from this device to the vagus nerve. This sends signals along the wire and nerve to the brain stem. The Food and Drug Administration (FDA) has also approved a noninvasive device for stimulating the vagus nerve.
- Closed-loop responsive neurostimulation: This involves putting an implant in the skull to monitor the brain. It sends signals when it detects the beginning of a seizure.
- Deep brain stimulation: A neurosurgeon implants electrodes in the brain. These transmit constant or intermittent signals to modulate the brain's activity, reducing the frequency of seizures.

According to a 2021 study published in *The Lancet*, more than half of people who experience seizures saw a long-term reduction in seizures after neuromodulation therapy. Doctors typically prefer this type of therapy over surgery because it is safer, reversible, and less invasive.

If medication and neuromodulation have no effect on a person's seizures, a doctor may recommend surgery. This involves removing the part of the frontal lobe where the seizures start. Before the operation, healthcare professionals will carefully monitor a person to pinpoint exactly which part of the brain causes the seizures. This also helps the surgeon avoid areas of the brain that control crucial functions.

Doctors sometimes recommend a ketogenic diet for people with epilepsy who do not respond to medication. This is a diet that is high in fat and contains very few or no carbohydrates.

According to research, the ketogenic diet has helped more than half of people see an improvement in seizure management, and 1 in 10 people avoid seizures altogether. However, the study participants were selected because their conditions were most likely to respond positively to this diet, so these results do not account for all people with epilepsy.

Although it can help some people, it is a very strict diet and can be hard to follow. Doctors usually reserve it for treating refractory seizures associated with conditions such as Dravet syndrome or Lennox-Gastaut syndrome.

Complications of frontal lobe epilepsy may include:

- **Injuries:** The loss of motor control during a seizure can result in injuries such as cuts, bruises, and fractures. Sometimes, a person may unintentionally bite their tongue during a seizure.
- **Status epilepticus:** This describes either a seizure that lasts more than 5 minutes or back-to-back seizures without a return to consciousness in between. This is a medical emergency that needs urgent treatment.
- **Sudden unexplained death in epilepsy (SUDEP):** According to the Centers for Disease Control and Prevention (CDC), 1 in 1,000 Trusted Source people with epilepsy die each year without any known cause. Most of these deaths occur during or immediately after a seizure.

People with frontal lobe epilepsy may be able to manage or reduce seizures with the right medication, diet, or surgery. Reducing seizures can help minimize the risk of complications developing. However, some people may need to stay on medication for the rest of their lives to manage their seizures.

Editor's Note: The Carpe Diem – Seize the Day Blog will be distributed and posted weekly.
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