

Carpe Diem – Seize the Day Blog

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There is at present no cure for epilepsy, although some people with epilepsy do go into remission — meaning all symptoms of the condition disappear. The good news is that while epilepsy is not yet curable, it is treatable for most people.

There is a wide range of epilepsy treatments, with most falling into one or more of four broad categories:

- Medication
- Diet
- Implanted devices
- Surgeries

Before recommending a course of treatment, a physician will consider your age, overall health, medical history, severity of condition, and type or types of seizure. The goal of epilepsy treatment is to stop seizures — or to at least decrease their frequency as much as possible. There is no one treatment that works for all types of seizures and types of epilepsy. Some epilepsies and seizure types are more difficult to treat because they are less responsive to most treatments.

In most cases, a medication will be the first treatment prescribed. On average, anti-seizure medications (ASMs) will work for 60 percent to 70 percent of people with epilepsy. However, in as many as 20 percent to 40 percent of epilepsy cases, seizures cannot be adequately controlled with any type of anticonvulsant medication. Drug-resistant epilepsy is also known as intractable or refractory epilepsy. In cases where ASMs are ineffective, doctors may recommend a special diet, an implanted device, or surgery.

Medication for Epilepsy

ASMs work in different ways, but they are all believed to reduce excess electrical activity in the brain. There is an increasing number of ASMs on the market, and many of the newer medications offer more focused treatment with fewer serious side effects.

Most ASMs are taken by mouth — some are designed to dissolve in the mouth instead of being swallowed. Other treatments are given rectally or as an injection. ASMs that can be administered as a nasal spray are under development.

If you have been prescribed a medication that is ineffective at controlling your seizures, or if its side effects are bothering you, contact your doctor. Finding the right medication and the right dosage can be a protracted process. In cases where ASMs are ineffective, the doctor may recommend diet changes or surgery.

Narrow-Spectrum ASMs

Narrow-spectrum ASMs treat specific types of seizures, such as focal seizures. Drugs in this category include:

- Briviact (brivaracetum)
- Carbamazepine (sold as Tegretol and Carbatrol)
- Dilantin (phenytoin)
- Lyrica (pregabalin)
- Neurontin (gabapentin)
- Phenobarbital
- Trileptal (oxcarbazepine)
- Vimpat (lacosamide)

Broad-Spectrum ASMs

Broad-spectrum ASMs can be effective for multiple seizure types. Broad-spectrum anticonvulsants include:

- Banzel (rufinamide)
- Depakote (divalproex sodium)
- Keppra (levetiracetam)
- Lamictal (lamotrigine)
- Topamax (topiramate)
- Xcopri (cenobamate)
- Zonegran (zonisamide)

Apart from ASMs, other classes of drugs may be prescribed to control seizures. For instance, Klonopin (clonazepam) is a sedative of the benzodiazepine class used to treat Lennox-Gastaut syndrome, a severe form of epilepsy. Phenobarbital is a barbiturate, a class of drugs that depress the central nervous system.

All ASMs have side effects, especially during the first few weeks of treatment. Common side effects of ASMs include:

- Drowsiness
- Dizziness
- Increase or decrease in appetite
- Mood changes
- Problems with memory or attention
- Vision changes

All ASMs are required by the U.S. Food and Drug Administration (FDA) to carry a suicide warning. The risk for suicide due to ASMs is quite low, but **anyone taking an ASM should be aware of and report any serious depression or suicidal thoughts to their doctor.**

Some ASMs can interfere with hormonal birth control methods, and some birth control pills can interfere with the effectiveness of ASMs. Certain ASMs are also known to have a higher risk of birth defects if either birth parent is taking them.

Never change your dose or stop your medication without consulting with your doctor. Withdrawal must be done with close supervision. Suddenly stopping a medication can cause more severe seizures.

Diet for Epilepsy

In cases where epilepsy is refractory (resistant to medication), doctors may recommend adopting a specific diet to help control seizures. Research shows that in combination with AEDs, a diet high in fat and low in carbohydrates can help some people control their epilepsy.

The ketogenic diet, used to treat children with refractory epilepsy, is an extreme diet involving fasting and monitoring by a physician and a nutritionist. The purpose of the diet is to force the body to burn fat for energy instead of carbohydrates, increasing the level of molecules called ketones in the blood. A ketogenic diet, in fact, acts the same way in the brain as ASMs. For some children, an elevated level of ketones reduces seizure activity.

For adults, a less extreme version of the ketogenic diet is the modified Atkins diet. One study found that the modified Atkins diet lowered seizure activity in nearly half of the adults who followed it for several months. **Diet changes should be made with your doctor's knowledge and guidance.**

Implanted Devices for Epilepsy

Some people with intractable epilepsy may be candidates for an implanted device such as a vagus nerve stimulator (VNS), a responsive neurostimulation (RNS) system, or a neurostimulator for deep brain stimulation (DBS). A person's eligibility for these devices varies by age. These devices are palliative options — meaning they are intended to provide symptom relief — for those who have tried several ASMs.

Vagus Nerve Stimulator

A vagus nerve stimulator is a device similar to a pacemaker that is implanted under the skin near the collarbone. The device uses a lead, or thin wire, to connect to the vagus nerve in the neck. It then stimulates the nerve at regular intervals, which can reduce the intensity and frequency of seizures. VNS may be more effective in treating focal seizures than other types of seizures.

Responsive Neurostimulation System

A responsive neurostimulation system may also be used to treat epilepsy. This system is a small, electronic device that is implanted inside the skull. One or two thin wires from the device are connected to the seizure targets. The device is then programmed to detect and record brain activity patterns and respond with electrical stimulation when abnormal patterns are detected. Stimulation cannot be felt. Once you have this device implanted, you will receive a brain-activity monitor that will record data and send it to the neurologist. People generally continue taking ASMs after receiving an implanted device.

Deep Brain Stimulation

Deep brain stimulation is a novel way of controlling seizures. It entails implanting an electrode in a specific area of the brain called the thalamus. The electrodes then deliver electrical impulses to regulate abnormal impulses or to affect certain brain cells and chemicals. This, in

turn, can reduce the frequency of seizures. DBS is approved for use in people ages eighteen and older with refractory epilepsy.

Surgery for Epilepsy

Surgical treatment may be recommended for people whose seizures are severe or frequent enough to be life-threatening or significantly impact quality of life. Candidates for epilepsy surgery must have failed several epilepsy drugs and have seizures with a known focus. Epilepsy surgeries fall into two general categories: resection and disconnection.

Resection Surgery

The most common type of neurosurgery for epilepsy is resection, in which the portion of the brain causing seizures is removed. If successful, the surgery can provide long-term remission from seizures. Names of resection procedures often end in “-ectomy,” which means “removal by cutting.”

Temporal lobectomy, also known as temporal lobe resection, is the most frequently performed of all epilepsy surgeries and has the highest rate of success. Other resection surgeries include:

- Extratemporal cortical resection
- Frontal lobectomy
- Lesionectomy
- Occipital lobectomy
- Parietal lobectomy
- Right frontal lobectomy

Disconnection Surgery

Disconnection surgeries attempt to limit the spread of seizure activity and reduce seizure frequency. Disconnection surgeries are known as palliative treatments because they can improve quality of life, but they do not cure epilepsy.

The most common type of disconnection surgery is the corpus callosotomy, in which the fibers connecting the two hemispheres, or sides of the brain, are severed to prevent the spread of seizures from one side to the other. Corpus callosotomy surgery is usually performed on children who have debilitating seizures that cause injuries and falls. Multiple subpial transection is another surgery designed to disconnect the seizure focus, limiting the spread of seizures. A functional hemispherectomy combines the resection of a seizure focus in one hemisphere with corpus callosotomy.

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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