**How is Epilepsy Treated?**

(modified from WebMD: <http://www.webmd.com>)

Medicine controls seizures in many people who have epilepsy. It may take time and careful, controlled changes to find the right combination, schedule, and dosing of medicine to best manage epilepsy. The goal is to prevent seizures and cause as few side effects as possible.

Medicines to prevent epileptic seizures are called antiepileptics or anticonvulsants. The goal is to find an effective antiepileptic medicine that causes the fewest side effects. Taking only one antiepileptic medicine prevents seizures in up to 7 out of 10 people who have partial seizures. About 8 out of 10 people have complete seizure control when they take more than one antiepileptic medicine.Although many people experience side effects, medicine is still the best way to prevent epileptic seizures. The benefits of treatment with medicine usually outweigh the drawbacks.

There are many antiepileptic medicines (called AEDs, anticonvulsants, or antiseizure medicines). But they do not all treat the same types of seizures. The first step the doctor takes in choosing a medicine to treat is to identify the types of seizures a patient has. The goal is to prevent seizures while causing as few side effects as possible. Using a single antiepileptic medicine is often better than using more than one medicine. Single medicine use causes fewer side effects and does not carry the risk of interacting with other medicines. The chances of missing a dose or taking it at the wrong time are also lower with just one medicine. When treatment with one medicine doesn't help enough, a second medicine to help improve seizure control may be added. Many medicines are used to treat epilepsy. Some are used alone, and some are used only along with other medicines. The medicine options depend in part on the types of seizures.

**Medication Choices**

Benzodiazepines (such as Klonopin)

Carbamazepine (such as Carbatrol or Tegretol)

Clobazam (Onfi)

Ethosuximide (Zarontin) for absence seizures only

Exogabine (Potiga)

Felbamate (Felbatol)

Gabapentin (Neurontin)

Lacosamide (Vimpat) Lamotrigine (Lamictal)

Levtriacetam (Keppra)

Oxcarbazepine (Trileptal, Oxtellar XR)

Perampanel (Fycompa)

Phenobarbitol (Luminal)

Phenytoin (Dilantin, Phenytek), or fosphenytoin IV (Cerebyx).

Pregabalin (Lyrica)

Primidone (Mysoline)

Rufinamide (Banzel)

Tiagabine (Gabitril)

Topiramate (Topamax, Trokendi XR)

Valproic Acid (Depakote)

Vigabatrin (Sabril)

Zonisamide (Zonegran)

**Other treatment options:**

**Epilepsy surgery removes an area of abnormal tissue in the brain,** such as a tumor or scar tissue, or the specific area of brain tissue where seizures begin. Before surgery is considered, a comprehensive presurgical exam is performed. This evaluation is performed to ensure that the operation will likely improve the seizures and will not cause damage to essential functions such as speech and memory. The evaluation requires prolonged EEG-video monitoring and other tests to pinpoint the exact location of the injured brain cells causing the seizures. The location of the damaged cells determines whether the surgery can be performed and what technique should be used. Surgery is most commonly performed to treat partial epilepsy, since only one area of the brain is involved. During surgery, the area of the brain that triggers the seizures is removed. The most common surgery is anterior temporal lobectomy, which is the removal of part of one of the brain's temporal lobes. After surgery, some patients will be completely free of seizures; in others, the seizures will be better controlled. A few patients may need additional surgery.

Other surgical approaches are reserved for specific types of epilepsy and are most often performed in young children. **Hemispherectomy**, removing a large part of one side of the brain may benefit children with uncommon, severe forms of epilepsy. Another surgery, **corpus collosotomy**, involves cutting the nerve fibers connecting the two sides of the brain.

Of the 30% of patients whose seizures cannot be controlled with drugs, approximately one third (more than 100,000 in the U.S.) may be candidates for epilepsy surgery. However, only about 3,000 epilepsy surgeries are performed annually.

**A device called a vagus nerve stimulator (VNS).** It is implanted under the skin in the upper chest and sends weak signals to the vagus nerve in the neck and to the brain to help control seizures. A vagus nerve stimulator works a lot like a pacemaker. It is surgically implanted in the chest, and delivers short bursts of energy to the brain. Scientists have found that it reduces seizures by about 40% to 50%. It does not work in everyone. Almost all patients need to continue taking medications after the stimulator has been placed, although many people can take fewer drugs.

**A special diet called the ketogenic diet.** This diet is one of the oldest treatments for epilepsy. It is intended to maintain the starvation or fasting metabolism or over a long period of time. When the body is in a fasting state, it creates ketones, a by-product of fat-burning metabolism. It has long been recognized that seizures often lessen or disappear during periods of fasting in some individuals with epilepsy. The diet is very high in fat and low in carbohydrates. When fat is the primary source of calories, ketones are formed. The diet must be followed very strictly and requires a significant commitment to work effectively. Children on the diet often will not gain weight or grow much during the time the diet is in use. After that, however, growth is expected and should be carefully monitored. The diet has been used mostly in children ages 2 through 12 with difficult-to-control, generalized epilepsies -- such as those with the Lennox-Gastaut syndrome. Recent studies have shown that the diet may also be effective in those with partial seizures. The diet is typically started with a period of fasting that lasts until the body produces a moderate to large amount of ketones. This initiation period usually takes place in the hospital, so that the individual can be monitored for potential side effects such as vomiting, low blood sugar, dehydration and seizures. A two-month trial period is suggested for deciding whether the diet is effective. If it is, it is typically continued for two years. During this time, individuals are often able to lessen the amount of medication they take for seizures. Many children seem happier and more alert on the diet, even before medication is significantly lessened. Monitoring by a dietitian, nurse, and doctor is important. Specialized epilepsy clinics are available to monitor a person on this diet.