



MEDICINES FOR EPILEPSY

ABOUT THE EPILEPSY FOUNDATION

The Epilepsy Foundation is the national voluntary agency solely dedicated to the welfare of the more than three million people with epilepsy in the U.S. and their families. The organization works to ensure that people with seizures are able to participate in all life experiences; and to prevent, control and cure epilepsy through services, education, advocacy and research. In addition to programs conducted at the national level, people with epilepsy are also served by local Epilepsy Foundation affiliates across the country.

If you have any questions about epilepsy and seizure disorders, living with epilepsy, or helping a friend or family member who has epilepsy, please visit us on the Web at www.EpilepsyFoundation.org or call

800-332-1000. Our Web site has information about the disorder, offers opportunities to network with others touched by epilepsy through our eCommunities forums and Web events. You can also subscribe to our bi-monthly magazine *EpilepsyUSA*. Each issue contains exciting developments for people affected by seizure disorders—new treatments and medicines, ground-breaking research, safety tips, personal stories, advice for parents and much, much more—all delivered right to your door.



MEDICINES FOR EPILEPSY

For more than 80 years, the most effective treatment for people with epilepsy (seizure disorders) has been use of seizure-preventing medications called anticonvulsant or antiepileptic drugs (AEDs).

While the medications do not cure epilepsy, they make it possible for many people to live normal, active lives completely free of seizures. Others may continue to have seizures, but less frequently.

If the drugs are not effective, other treatment methods may be used. In children, the ketogenic diet (a high fat, low carbohydrate, restricted calorie diet prescribed by the doctor) may be an option. For some people, surgery may be recommended, or treatment with a device that delivers electrical signals to the brain through the vagus nerve.

THE RIGHT MEDICINE

Whenever possible, doctors try to prevent seizures with a single medication (monotherapy), although some people may need more than one medication (polytherapy) to achieve seizure control.

When selecting a drug, your doctor will consider the type of seizures you have. Not all medications work for all types of seizures.

Your doctor will also consider how the medications may affect you. People react individually to medicines just as they do to other substances that enter the body, and one person may experience side effects while another may not. What all this means is that doctors may have to try several medications to find one that is effective for you with the least amount of side effects - or no side effects.

With so much variability among people, it may also take some time to customize the dosage of medication. One of the ways your physician determines how much medication you need to take is to measure how much of it is present in your blood. Some medicines reach an effective, seizure-preventing level in the blood more quickly than others. The level of medication in your body that is effective for your seizures may differ from someone else's.

If seizures are not controlled and the level of medication in your blood is low, the dose of medication may have to be increased. If the level is too high, side effects are more common and the dose may be reduced in some individuals.

SIDE EFFECTS

Like all drugs, antiepileptic medications may have both the desired effect of controlling seizures and undesirable side effects. Some of these are dose-related and occur only when a person is taking high levels of medication.

Other side effects may occur regardless of dose and some may be an allergic type of reaction, such as a rash.

Side effects tend to be more common when a drug is just started or a major change in dosage is made. These side effects may go away after several days. Many people experience no side effects.

When you start a medication, ask your doctor about potential side effects and when to report them.

If you experience side effects, discuss them with your doctor. Side effects can vary, depending on your medication. Common side effects include drowsiness, fatigue, nausea, vision changes, clumsiness and rash. Some medications may also affect emotions, activity level (including hyperactivity), memory or the school performance of children.

Several epilepsy drugs may have specific effects on other body organs such as the liver and blood cells, which your doctor may monitor.

OTHER MEDICINES

When someone is taking several medications they can affect each other and cause a drug interaction.

Drug interactions may increase or decrease the effect of the medications on your body. For example, some antiepileptic drugs and birth control pills may interact, making the birth control pills less effective. Women with epilepsy who are considering using birth control pills should discuss this possibility with their doctors.

To avoid other undesirable drug interactions, always tell your doctor, dentist and pharmacist what other medications you are taking.

Even when buying and using over-the-counter medications and alternative medications such as herbal supplements, it is a good idea to check with your pharmacist about possible drug interactions.



GENERICS

Many antiepileptic medications come in two forms, either “brand name” or “generic.”

Brand name medications are made by one company. Generic medications are often made by a number of different companies.

The chemicals in both brand and generic medications are exactly the same. How quickly they are absorbed from your stomach or processed by your body may be different, however, which may affect how much medicine you need.

If your pharmacist asks whether you would like your medication to be brand name or generic, it is a good idea to check first with your doctor about which form of drug would be best for you.

PREGNANCY

All women have a 2-3% risk of having a child with a birth defect. However, this risk is higher in women with epilepsy, estimated at 4-6%. Genetic factors and taking antiepileptic medications may both play a role in this risk.

The effects of medication on a developing child seem to occur mostly in the first few weeks of pregnancy, often before a woman knows she is pregnant.

Therefore, it is best for a woman with epilepsy to talk about these issues with her doctor before she becomes pregnant. This discussion should include her primary care physician, neurologist and obstetrician/gynecologist.

For some women planning to become pregnant, it may be appropriate to make changes in the medicine or to try to taper off medication if they have been doing well. However, this should be done only after careful discussion and guidance from their doctor.

Taking prenatal vitamins, especially folic acid, before and during pregnancy may decrease the risk of birth defects.

If a woman with epilepsy discovers she is pregnant, she should notify her doctor immediately, but should not stop or alter her medication on her own. Suddenly stopping epilepsy medication can cause frequent or severe seizures that can threaten her life or the continuation of the pregnancy. In most cases, it is unlikely that medications will be stopped.

During pregnancy, there are changes in the way a woman's body processes medication. For that reason, the dose may have to be closely monitored and frequently adjusted.

While pregnancy presents special concerns for women with epilepsy, more than 90% of those who become pregnant give birth to normal, healthy infants.

CHILDREN

Many children who experience a first seizure are not started on antiseizure medication.

However, if their seizures continue, medication is usually prescribed. For children, as for adults, the goal of treatment is the fewest number of seizures possible, hopefully none, and the fewest side effects from the medicine.

Regular checkups for a child with epilepsy are important. As children grow and increase in weight, they may need changes in how much medication they are taking.

Because of differences in the way children and adults process medicines, it takes a relatively larger dose of a drug to control seizures in the average child than in the average adult.

Particularly at the onset of puberty, when a child's body chemistry begins to change to that of an adult, teenagers may need to have their dosage of medication adjusted.

Children should be encouraged to take responsibility for taking their epilepsy medication. It gives them a sense of independence and control and teaches them about taking medication on time.

However, parents or guardians need to make sure that the medication is being taken. It can be very difficult, even for the most disciplined adult, to take medication every day.

Use of a weekly pill box, which can be purchased at a drug store and filled each week, can be helpful in monitoring how often the medicines are taken.

Periodically checking medication bottles will help to make sure prescriptions are being taken and refilled regularly.

Changes in seizure frequency, or the appearance of new side effects, may also be signs that the medication is not being taken properly. If these happen, parents or guardians should carefully review whether the child is getting the medication as prescribed.

Children who take medication three or more times a day may have to take it at school. Parents will want to check with the school administration to see how these medications should be handled.

Most schools will ask parents to send in a labeled bottle of medication to be kept in a school clinic rather than have children take their medication to school.

Parents sometimes worry that children or young adults who take epilepsy medication may become addicted to them or be more likely than others to become drug abusers.

There is no evidence of this. In fact, a more common reaction of many adolescents with epilepsy is to express rebellion against parents by failing to take the medication rather than by taking too much.

People who suddenly stop the medication may experience a marked increase in the severity of their seizures. However, this reaction is not due to addiction, but to the ongoing need for medication to prevent seizures.

SENIORS

People 60 and above are the fastest growing segment of our population. Epilepsy is becoming a more common occurrence in this age group. Fortunately, most seniors with seizures can be effectively treated with antiepileptic drugs and continue to lead productive lives.

Use of antiepileptic drugs in seniors can create several unique circumstances.

Senior men and women may be taking medications for other medical problems. There is an increased risk that their antiepileptic medication may interact with those other drugs. Therefore, it is especially important for seniors to tell their doctors and their pharmacists about all the medications they are taking.

Seniors may also be more sensitive to drug side effects, such as unsteadiness when walking, or fatigue. Should these occur, they should be reported to the doctor or other members of the health care team.

Some seniors have difficulty taking medications regularly. Forgetfulness, confusion over the multiple medications they must take, or simple problems such as difficulty opening pill bottles may all be involved. It is important for spouses, families and caretakers to be alert for these problems and provide help when necessary. A weekly pill box, filled with the assistance of a caregiver, may be helpful and can be easily monitored.



OTHER TREATMENTS

If medication does not control seizures, or if someone is highly sensitive to side effects, there may be some other options that can be tried.

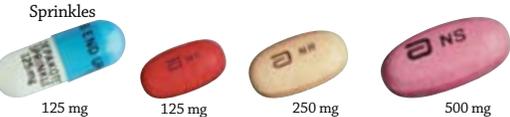
Surgery to remove part of the brain where seizures are known to originate, or to stop the spread of seizure activity from one side of the brain to the other may be one option. Epilepsy surgery, like other forms of treatment, has its own risks and benefits, and there is likely to be a lengthy period of testing before the decision to operate is made.

The ketogenic diet may be an option for children with hard-to-control seizures. It is very high in fat, low in carbohydrates, with restricted calories and no sugar. Some children do very well on the diet; others are helped to a degree, and for some children it is either not tolerated or not effective. Since the diet uses food to produce chemical changes in the body, it must be prescribed and monitored by a physician with assistance from a dietitian and a committed family team.

Electronic stimulation (the vagus nerve stimulator, or VNS) of the brain may be a third option when other forms of treatment fail or a person has unwanted side effects. This technique uses an implanted battery to deliver regular bursts of energy direct to the brain via the vagus nerve. The device is programmed by the physician, but the patient can also vary the amount of stimulation he or she is getting. As with other treatments, some people do better than others.

Finally, there is increasing hope that continuing research will lead to new treatments that will give seizure relief to everyone who has epilepsy.

Medicines for Epilepsy

FORM (of brand name product)	BRAND NAME (generic name)	AVERAGE ADULT DAILY DOSE	SOME SIDE EFFECTS
 <p>0.5 mg 1 mg 2 mg</p>	<p>*ATIVAN* (lorazepam)</p>	<p>1 mg–10 mg</p>	<p>Drowsiness, sleepiness, fatigue, poor coordination, unsteadiness, behavior changes</p>
 <p>200 mg 400 mg</p>	<p>BANZEL™ (rufinamide)</p>	<p>3200 mg</p>	<p>Drowsiness vomiting, headache, fatigue, loss of appetite and dizziness.</p>
 <p>100 mg 200 mg 300 mg</p>	<p>CARBATROL® (extended release carbamazepine)</p>	<p>600 mg–1200 mg</p>	<p>Dizziness, drowsiness, blurred or double vision, nausea, skin rashes, abnormal blood counts (rare)</p>
 <p>250 mg</p>	<p>DEPAKENE® (valproate)</p>	<p>1750 mg–3000 mg</p>	<p>Upset stomach, altered bleeding time, liver toxicity, hair loss, weight gain, tremor</p>
 <p>Sprinkles 125 mg 125 mg 250 mg 500 mg</p>	<p>DEPAKOTE® (divalproex sodium)</p>	<p>1750 mg–3000 mg</p>	<p>Upset stomach, altered bleeding time, liver toxicity, hair loss, weight gain, tremor</p>
 <p>250 mg 500 mg</p>	<p>DEPAKOTE® ER (extended release divalproex sodium)</p>	<p>2000 mg–3500 mg</p>	<p>Upset stomach, altered bleeding time, liver toxicity, hair loss, weight gain, tremor</p>
 <p>Generic available in 125 mg and 250 mg tablets</p>	<p>DIAMOX® SEQUELS® (extended-release acetazolamide)</p>	<p>250 mg–1000 mg</p>	<p>Appetite loss, frequent urination, drowsiness, confusion, numbness of extremities, kidney stones</p>

Actual doses for a person with epilepsy may be higher or lower than the doses listed.

Not all individuals experience side effects. This partial list names some side effects individuals may experience.



50 mg 30 mg 100 mg

DILANTIN®
(phenytoin)

200 mg–400 mg

Clumsiness, insomnia, motor twitching, nausea, rash, gum overgrowth, hairiness, thickening of features



400 mg 600 mg

FELBATOL®
(felbamate)

1200 mg–3600 mg

Anorexia, vomiting, insomnia, nausea, headache, liver and blood toxicity



2 mg 4 mg 12 mg 16 mg

GABITRIL®
(tiagabine)

36 mg–56 mg

Tremor, dizziness, nervousness, difficulty concentrating, sleepiness, weakness



250 mg 500 mg 750 mg 1000 mg

KEPPRA®
(levetiracetam)

1000 mg–3000 mg

Sleepiness, fatigue, poor coordination, loss of strength, dizziness



500 mg

KEPPRA XR™
(extended release
levetiracetam)

1000 mg–3000 mg

Sleepiness, fatigue, poor coordination, loss of strength, dizziness



0.5 mg 1 mg 2 mg

Also available as wafers
in blister packs

KLONOPIN®
(clonazepam)

1.5 mg–20 mg

Drowsiness, sleepiness, fatigue, poor coordination, unsteadiness, behavior changes

Chewable Dispersible



2 mg 5 mg 25 mg 25 mg 100 mg 150 mg 200 mg

LAMICTAL®
(lamotrigine)

100 mg–500 mg

Dizziness, headache, blurred vision, clumsiness, sleepiness, nausea, skin rash



25 mg 50 mg 75 mg 100 mg
150 mg 200 mg 225 mg 300 mg

LYRICA®
(pregabalin)

150 mg–600 mg

Dizziness, blurred vision, weight gain, sleepiness, difficulty concentrating, swelling of hands and feet, dry mouth



50 mg 225 mg

MYSOLINE®
(*primidone*)

250 mg–1000 mg

Clumsiness, dizziness, appetite loss, fatigue,
drowsiness, hyperirritability, insomnia,
depression, hyperactivity (children)



100 mg 300 mg 400 mg

600 mg 800 mg

NEURONTIN®
(*gabapentin*)

900 mg–3600 mg

Sleepiness, dizziness, clumsiness,
fatigue, twitching



15 mg 30 mg 60 mg 100 mg

PHENOBARBITAL
(*phenobarbital*)

15 mg–100 mg

Drowsiness, irritability, hyperactivity
(children), behavioral problems,
difficulty concentrating, depression



200 mg 300 mg

PHENYTEK®
(*extended phenytoin sodium*)

200 mg–400 mg

Clumsiness, insomnia, motor twitching,
nausea, rash, gum overgrowth,
hairiness, thickening of features



100 mg 200 mg

TEGRETOL®
(*carbamazepine*)

600 mg–1200 mg

Dizziness, drowsiness, blurred or
double vision, nausea, skin rashes,
abnormal blood counts (rare)



100 mg 200 mg 400 mg

TEGRETOL XR®
(*extended release carbamazepine*)

600 mg–1200 mg

Dizziness, drowsiness, blurred or
double vision, nausea, skin rashes,
abnormal blood counts (rare)



25 mg 50 mg 100 mg 200 mg

TOPAMAX®
(*topiramate*)

200 mg–400 mg

Confusion, sleepiness, dizziness,
clumsiness, difficulty thinking or
talking, tingling sensation of the skin,
nausea, decreased appetite



15mg 25 mg



TRANXENE®
(clorazepate)

15 mg–45 mg

Drowsiness, sleepiness, fatigue, poor coordination, unsteadiness, behavior changes



TRILEPTAL®
(oxcarbazepine)

600 mg–2400 mg

Difficulty concentrating, sleepiness, fatigue, dizziness, double vision, nausea, unsteadiness, rash



VIMPAT®
(lacosamide)

200 mg–400 mg

Dizziness, headache, nausea, vomiting, double vision, blurred vision, walking difficulty, drowsiness, diarrhea, falls, unintentional rapid eye movement, tremor



ZARONTIN®
(ethosuximide)

500 mg–1500 mg

Appetite loss, nausea, drowsiness, headache, dizziness, fatigue, rash, abnormal blood counts (rare)



ZONEGRAN®
(zonisamide)

100 mg–600 mg

Sleepiness, dizziness, loss of appetite, headache, nausea, irritability, difficulty concentrating, unsteadiness, fever, kidney stones, rash (should not be used in individuals allergic to sulfa drugs)



The following medicine is not prescribed for daily, long-term use, but to stop episodes of prolonged or cluster seizures.

DIASTAT® ACUDIAL™
(diazepam rectal gel)

Average Single Dose
0.2 mg. – 0.5 mg./kg.

Drowsiness, sleepiness, fatigue, poor coordination, unsteadiness, behavior changes

* Sometimes prescribed for epilepsy, but not FDA-approved for that use.



*Epilepsy Foundations throughout the country have additional materials
and offer a variety of programs to help people understand this common disorder.
For further information about epilepsy and the name of the Epilepsy Foundation nearest you,
log on to www.epilepsyfoundation.org or call 800-332-1000.*

This pamphlet is intended to provide basic information about epilepsy to the general public. It is not intended to, nor does it, constitute medical advice. Readers are warned against changing medical schedules or life activities based on the information it contains without first consulting a physician.