Epilepsy: A Cause of Seizures in Dogs

Drs. Foster & Smith Educational Staff

What is epilepsy?
Epilepsy is a disorder of recurring seizures. Seizures are described as an uncoordinated firing of the neurons usually within a portion of the brain called the cerebrum. The mechanisms of why these neurons do not function normally in epileptic dogs is not understood, but is similar if not identical to the causes in humans. Probably certain substances called neurotransmitters are not in the proper chemical balance, so the nerves do not behave in the normal coordinated fashion. A dog with epilepsy will exhibit periodic bouts of uncoordinated firing of the neurons within the brain. These episodes are called seizures and occasionally are referred to as convulsions or "fits."

Epilepsy generally starts in dogs 6 months to 5 years of age, usually at 2-3 years.

Causes of seizures

When we are first presented with a dog that has had a seizure, we initially attempt to find the cause. Seizures can be caused by many conditions:

- Congenital defects
- Blood glucose levels that are too high (e.g.; diabetes mellitus) or too low (hypoglycemia)
- Low oxygen levels in the blood that could be caused by anemia, heart problems, or difficulties with breathing
- Kidney disorders
- Liver disorders
- Infections such as canine distemper
- Brain tumors
- Toxins, like antifreeze, lead, or chocolate
- Fevers and hyperthermia
- Brain damage resulting from trauma or poor blood flow to the brain
- Certain medications
- Low calcium in females that are nursing young (eclampsia)
- Primary or idiopathic epilepsy

Types of seizures

Partial seizures typically affect only a small part or one side of the body. These are often caused by a brain lesion. Partial seizures can be simple such as facial twitching or excessive pawing or biting of a body part. They can also be more complex (psychomotor seizures) and cause bizarre behavior changes such as howling incessantly, biting at the air (fly-biting), and aggression without provocation.

Generalized seizures affect the whole body and can be divided into two types, grand mal and petit mal. Grand mal seizures are the most common. A dog experiencing a grand mal seizure usually falls on her side and has uncontrollable muscle activity such as kicking her legs as if swimming or paddling. Salivation is profuse and often the dog involuntarily urinates and defecates. The dog is unaware of you, her surroundings, or her own actions. Petit mal seizures do not result in convulsions, but the animal loses consciousness. It may look like the dog just collapsed.

The worst form of seizure is one in which the dog has one or more grand mal episodes without recovering from the first. This dog may actually be in a seizure for hours. This is termed 'Status Epilepticus' and is usually referred to simply as 'Status'. Seizures by themselves are not life threatening unless they progress into Status, in which case medical attention should be sought immediately.

What are the phases in a seizure?

If you observe closely, you can often recognize several phases to a seizure.

Prodrome: The pre-seizure phase causes behavioral changes and can last for minutes to hours. Your dog may appear restless, pace, seek affection, salivate, whine, or hide.

Aura: This is hard to determine in an animal because it is a sensory experience, but you may notice a behavioral change just minutes before a seizure.

*Unauthorized use of any images, thumbnails, illustrations, descriptions, article content, or registered trademarks of **Foster & Smith, Inc.** is strictly prohibited under copyright law. Site content, including photography, descriptions, pricing, promotions, and availability are subject to change without notice. These restrictions are necessary in order to protect not only our copyrighted intellectual property, but also the health of pets, since articles or images that are altered or edited after download could result in misinformation that may harm companion animals, aquatic life, or native species.*

Ictal Period: This is the actual seizure. Your dog may appear excited, vomit, salivate, run in circles, collapse, and have uncoordinated muscle activity. This stage generally lasts less than 5 minutes.

Post-Ictal Phase: After the seizure, the recovery (post-ictal) period begins. Your dog may seem disoriented, uncoordinated, and occasionally blind (temporary). This may last several minutes to days.

Rarely does a dog become vicious during a seizure. In fact, most dogs will actually feel the seizure coming on and seek out the owner for comfort. During the actual seizure, a dog is unaware of his surroundings so it does little good for the owner to try to comfort the seizuring dog. It is best to be there for comfort when the dog recovers.

What triggers a seizure?

The actual triggering of a seizure is unknown, but many dogs tend to seizure during periods of excitability. Often, the owner will state that the dog seizures while playing ball or when the children returned home from school. We had one dog who seizured the day after visiting our veterinary hospital, no matter what the reason for the visit. Some dogs have been known to seizure while sleeping. Please do not confuse this with dreaming, where it is common for the dog to bark or shake while sleeping. A dreaming dog can be awakened, but a seizuring dog cannot.

How is epilepsy diagnosed?

First, a detailed history is needed. A physical and neurologic exam are performed by your veterinarian, a panel of laboratory tests are run, and sometimes a CT scan or MRI of the brain will be recommended. If a cause of the seizure cannot be identified, the condition is diagnosed as idiopathic or primary epilepsy. There is no test to diagnose epilepsy per se, our tests simply rule out other causes of seizures.

What type of information can the owner provide to help the veterinarian make the diagnosis?

It is helpful if you, the owner, can give your veterinarian answers to the following questions:

- What does your dog look like when he is having seizures?
- What is the duration of each seizure and how often do they occur?
- Are there signs that only appear on one side of your dog (is one side worse than the other)?
- Has your dog had a high fever?
- Has your dog been exposed to any toxins?
- Has your dog experienced any trauma recently or years ago?
- Is your dog current on vaccinations?
- Has your dog been recently boarded or with other dogs?
- Has your dog had any other signs of illness?
- Has your dog been running loose in the last several weeks?
- What and when does your dog eat?
- Has your dog had any behavior changes?
- Do the seizures occur in a pattern related to exercise, eating, sleeping, or certain activities?
- Does your dog show different signs right before or right after the seizures?

Are some dogs more prone to epilepsy?

Epilepsy generally starts in dogs 6 months to 5 years of age, usually at 2-3 years.

Epilepsy occurs in all breeds of dogs, including mixed breeds. Epilepsy can be a genetic trait. It can even be familial, which means the epileptic disorder can pass down through generations within one family. Beagles, German Shepherds, Irish Setters, Poodles, Saint Bernards, Springers, Malamutes and Huskies, Cockers, Collies, Dachshunds, and Golden and Labrador Retrievers are some of the breeds which have a higher tendency to develop epilepsy. It is recommended that dogs with epilepsy should not be used for breeding, since this tendency can be inherited.

How is epilepsy treated?

Treatment for epilepsy is usually not begun until a seizure is severe or multiple seizures have occurred and a pattern is observed. It is very important to know the pattern of seizures in your dog so your veterinarian can determine if the treatment is helping.

*Unauthorized use of any images, thumbnails, illustrations, descriptions, article content, or registered trademarks of **Foster & Smith, Inc.** is strictly prohibited under copyright law. Site content, including photography, descriptions, pricing, promotions, and availability are subject to change without notice. These restrictions are necessary in order to protect not only our copyrighted intellectual property, but also the health of pets, since articles or images that are altered or edited after download could result in misinformation that may harm companion animals, aquatic life, or native species.*

TREATMENT IS NEVER CURATIVE. The goal is to decrease the frequency, severity, and duration of the seizures.

Medications used to treat epilepsy are given orally. Each dog reacts differently to the medications. Your veterinarian may need to try different types or combinations to find what will be right for your dog. Many dogs will become sleepy when they first start medication, but this soon wears off after several weeks.

The drugs most commonly used to control epilepsy are phenobarbital and potassium bromide (KBr), either used singly or in combination with each other. They must be given every day. Blood levels are generally checked periodically, and laboratory testing prior to placing the dog on phenobarbital, especially, is recommended. Once medication has started it is IMPORTANT to NOT suddenly discontinue or 'skip' a dose of medication. Severe seizures could result. In general, most dogs on anticonvulsant therapy will need to continue the medication for life. Other drugs that have been used to treat epilepsy in dogs include Felbamate, Gabapentin, Levetiracetam (Keppra), and Zonisamide.

If a dog experiences prolonged seizures referred to as Status, injectable drugs such as valium are administered intravenous for rapid effect.

Phenobarbital and related anti-epileptic drugs can have side effects on the liver, especially if high dosages are required. We usually suggest liver function tests before we adjust dosages upward. Although this is a good practice, it is very rare to see liver damage even at high levels.

Approximately 20-30% of dogs cannot be controlled with phenobarbital alone or may become refractory to treatment and start having seizures again. At this time a phenobarbital level should be tested to determine if it is at the therapeutic level. Phenobarbital levels should be checked every 6 months. If the dog is at the maximum therapeutic level of phenobarbital, but still having seizures then potassium bromide or another anti-convulsant may be added.

What should I do if my dog has a seizure?

1. Remain calm.
2. Do not put your hand in your dog's mouth. This will not help your dog and you may be bitten. (Contrary to popular belief, a dog will not swallow his tongue.)
3. To prevent injury to your dog, remove nearby sharp or hard objects (e.g.; tables and chairs).
4. If the dog is on a couch or human bed, lower the dog to the floor, if it can be done safely. This will avoid any injury from falls.
5. Remove children and other pets from the area.
6. Observe your dog closely. Call your veterinarian if the seizure lasts more than 3 minutes, or if your dog has one seizure right after another. Severe and long seizures are a medical emergency and can be fatal.

A single, mild seizure is not an emergency and rarely indicates the need for long-term treatment. But at a convenient time, you should call your veterinarian and report what occurred. Be sure to record the date, time, and duration of any seizure.

*Unauthorized use of any images, thumbnails, illustrations, descriptions, article content, or registered trademarks of **Foster & Smith, Inc.** is strictly prohibited under copyright law. Site content, including photography, descriptions, pricing, promotions, and availability are subject to change without notice. These restrictions are necessary in order to protect not only our copyrighted intellectual property, but also the health of pets, since articles or images that are altered or edited after download could result in misinformation that may harm companion animals, aquatic life, or native species.*