Seizures

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What is an epileptic seizure?
The diagnosis and treatment of seizure disorders in small animals is similar in many respects to the treatment of other ailments: a historical problem arises, a proper diagnosis is made to confirm the condition, and therapy is started to treat the underlying disease and/or signs of the disease. Unlike other diseases, however, a long period of normal activity may occur between the seizure events. Even during these normal periods serious conditions may still be present as the cause of seizures.

What are the signs of seizures?
The first and most important level of assessment is to be sure that an epileptic seizure has occurred, and if so, the seizure type(s) manifested. An epileptic seizure is the clinical sign of excessive, abnormal electrical activity in the brain. An animal is categorized as having epilepsy if recurrent seizures occur indicating a chronic brain disorder.

The clinical features of epileptic seizures can be separated into three components:

- The **aura** is the initial manifestation of a seizure. During this time period, which can last from minutes to hours, animals can exhibit recurrent pacing or licking, excessive or unusual salivating or vomiting, and/or even unusual behavioral events, such as excessive barking or increased or decreased attention seeking. Some owners even report that they know that their own dog is going to seizure days in advance by changes in the animal's behavior.
- The **ictal** period is the actual seizure event manifested by involuntary muscle tone or movement and/or abnormal sensations or behavior lasting usually from seconds to minutes.
- Following the ictal event is the **post-ictal** period. During this time, an animal can exhibit unusual behavior, disorientation, inappropriate bowel/bladder activity, excessive or depressed thirst and appetite, and actual neurologic deficits, such as weakness or blindness.

Single seizures can be classified into two categories: **partial** and **generalized**.

- **Partial** seizures are the result of a focal abnormal electrical event in the brain. Animals with **simple partial** seizures have a sudden change in activity without loss

of consciousness, such as twitching of facial muscles. Animals with **complex partial** seizures often show unusual behavioral activity, such as running wildly around the house.

- **Generalized** seizures are either **convulsive** ("grand mal") or **non-convulsive** ("petit mal") seizures. By far, generalized convulsive seizures are the most common seizure type seen in animals and are characterized by impaired consciousness coupled with symmetric stiffening, paddling, or even loss of movement of the limb muscles. The severity of the disease does not necessarily match the causes because dogs with brain tumors may have very mild partial seizures, whereas dogs with idiopathic epilepsy (aka "cryptogenic" epilepsy), meaning that no obvious cause of the disease exists, may have severe generalized seizures.

What tests are needed?

Like a cough signals a problem in the airway, a seizure tells us there is a problem in the brain, but not the cause. The goals of a diagnostic evaluation are to determine the underlying cause, evaluate the chance for recurrence, and establish if medication is necessary for treatment. Idiopathic epileptic (IE) seizures are diagnosed if no underlying cause for the seizure can be identified. These may be due to as yet unidentifiable (viral, scar tissue in the brain) causes or as a result of a heritable **primary epilepsy** (PE).

Some purebred dog breeds that have a high prevalence of an inherited component to their seizures include the following:

- Beagles
- Belgian tervurens
- Keeshonds
- Dachshunds
- Siberian huskies
- German shepherds
- Border collies
- Irish setters
- Golden retrievers

Secondary epileptic seizures (SES) are the direct result of an abnormal brain structure. Some conditions include developmental brain problems, inflammation, infection, tumors, or strokes..

Reactive epileptic seizures (RES) are a reaction of the normal brain to transient systemic insults such as a toxin that was ingested or circulating toxic products from liver disease.

A higher suspicion for an underlying identifiable cause (SES or RES) for the seizures is found in dogs that have an initial seizure at less than 6 months or greater than 6 years years of age, an initial interval between the first and second seizure event of less than 4 weeks, or persistent neurological deficits between seizures.

What treatment is needed?
Ideal therapy would lead to a seizure-free status without unacceptable adverse effects. However, this optimal balance is achieved in less than half of epileptic people, and probably just as many dogs. Prior to starting medication to control seizures, owners and veterinarians need to establish realistic expectations and treatment goals. First and foremost is that seizure **control** does not equal **elimination**. A decrease in the frequency of seizures, the severity of individual seizures, and post-seizure complications is the realistic goal. A daily oral medication regimen is needed, with specific timing of medication administration. Re-evaluations are required long-term, and there is always a potential for an emergency situation to arise that requires immediate veterinary care. The specific complications and side-effects of any drugs used should be thoroughly explained prior to starting treatment.
The decision to start therapy is based on the underlying cause, seizure type and frequency, and post-ictal effects. Selection of the appropriate drug is based on the pharmacokinetic properties, the effectiveness, and the adverse effects of that drug. Acceptable criteria of an anti-epileptic mediation is one that need not be given more 2 to 3 times per day, has a documented benefit, and is well tolerated by the animal.

In this sense, the two most widely used anti-seizure medicatons in the dog are phenobarbital and potassium bromide. Bromide has the benefit of reduced chance of liver toxicity but may not be as effective as phenobarbital to stop all types of seizures or work as quickly. Bromide should not be used in cats because of the risk of respiratory problems. Several medication used by epileptic people are now also available for both dogs and cats that do not respond well to standard treatments. These drugs are designed for better control and less side effects but are more expensive. Ask your veterinarian about possible alternative treatment options.

Over time, periodic measurements of the amount of drug present in the blood stream is necessary to determine that an acceptable level of medication is present. At the same time, blood tests to evaluate liver function may be necessary. These periodic evaluations are important to try to maximize the benefit of drug therapy, whereas monitoring for early detection of possible complications.

Treating each animal as an individual, applying the philosophy that seizure prevention is better than intervention, and consulting your veterinarian to help formulate or revise treatment plans will lead to improved success in treating seizure disorders in your pet. Keeping information in a journal regarding seizure frequency, post-ictal changes, and medication dosages/changes can help your veterinarian better regulate your pets epilepsy. Regular communication with your veterinarian is essential in long-term management of these disorders.

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