

## Seizures in Dogs

Seizures are one of the most frequently seen neurological problems in dogs. A seizure is also known as a convulsion or fit. A seizure represents a period of abnormal brain wave activity that leads to a variety of clinical signs.

### Prevalence

Seizures represent a common neurologic disturbance in the dog.

### Clinical Signs

A number of signs may be observed when a dog is having a seizure. Signs usually start suddenly and end abruptly. They may involve the whole body or just parts of the body, such as one limb or particular muscles of the face. Some of the more common signs include:

1. Loss of consciousness or a change in level of consciousness
2. Contractions of all the muscles in the body, paddling of the legs, chewing.
3. Loss of control of the bowels or bladder.
4. Changes in mental awareness from non-responsiveness to hallucinations
5. Behavioral changes, including non-recognition of owner, viciousness, pacing, and running in circles

### Components of a Seizure

A seizure occurs in three phases:

- 1) The pre-ictal phase, or aura, is a period of altered behavior in which the dog may hide, appear nervous, or seek extra attention from people it knows. It may be restless, nervous, shaking, or salivating. This may last a few seconds to a few hours.
- 2) The ictal phase describes the seizure itself and lasts from a few seconds to about five minutes. During this period, the muscles of the body contract strongly. The dog usually falls on its side and seems paralyzed while shaking. The head will be drawn backward. Urination, defecation, and salivation often occur. If it is not over within a few minutes, the dog is said to be in status epilepticus, or a prolonged seizure.
- 3) During the post-ictal phase, there is confusion, disorientation, salivation, pacing, restlessness, and/or temporary blindness. There is no direct correlation between the severity of the seizure and the duration of the post-ictal phase.

Dogs that do not receive medical attention with status epilepticus are at risk for serious complications because of the physiological changes that occur. Most significant is the rise in body temperature that occurs from continuous strong muscle activity. This can lead to hyperthermia and death.

Any dog that has even one seizure at home should be seen by a veterinarian as soon as possible. **DO NOT WAIT TO SEE IF ANOTHER SEIZURE WILL OCCUR.** If the seizure lasts more than 3-4 minutes (status epilepticus), your dog should be seen immediately.

### Causes/Transmission

There are many, many causes of seizures. For this reason, when we first begin an evaluation of the dog with seizures, we think less in terms of the specific disease and focus more on categories of diseases. For example, if this is a young dog, could there be a structural abnormality, such as hydrocephalus? In an older animal, could it be a degenerative disease or a brain tumor? For outdoor dogs, what is the potential for exposure to toxins such as antifreeze?

Epilepsy is the most common cause of seizures in young to early middle aged dogs. The other extreme includes severe diseases such as brain tumors in older dogs. However, there are causes other than these 2. Your veterinarian will discuss possible causes and any tests to diagnose the cause.

## **Evaluation of the Dog with Seizures**

When a seizure occurs, it is important that you give your veterinarian a thorough account of recent events, especially recent exposure to any toxins, poisons, medications, hallucinogenic substances or history of head trauma. Do not be embarrassed if your dog has ingested a recreational drug. Your veterinarian will not think less of you for exposing your dog to such a drug and knowledge of exposure will make it more likely to successfully treat your dog. Your veterinarian will actually be thankful for your honesty. They will not tell other people about the cause of your dog's seizures in such a case. A physical examination, a basic battery of blood tests, and perhaps an electrocardiogram (EKG) are also commonly performed. These tests rule out disorders of the liver, kidneys, heart, electrolytes, and blood sugar level.

If these tests are normal and there is no exposure to poison or any history of trauma, further diagnostics may be performed depending on the severity and frequency of the seizures and the age or history of your dog. A spinal fluid tap and fluid analysis may be performed. Specialized imaging of the head with a CAT scan or MRI may be recommended.

## **Treatment**

Your dog may be hospitalized for a "seizure watch". During this time in the hospital your dog will be observed for seizures and treated immediately to prevent the seizures from escalating in severity or duration. Once there have been no seizures for 24 hrs, your dog will be discharged. If medication is necessary to continue to control the seizures, you will be instructed to see your veterinarian immediately at discharge from the emergency hospital to prescribe his/her choice of anti-seizure medications.

If your dog does not have any more seizures after admitted to the hospital and had only one at home, it will most likely be discharge for you to continue to watch at home for further seizures in the future. There is a saying in neurology (both human and veterinary): "All patients are entitled to have one seizure in their life time." What this means is one seizure does not warrant continued daily treatment. However, if another seizure ever occurs, you and your veterinarian should discuss the pros and cons of starting medication for the seizures and any other diagnostic tests to determine the cause of the subsequent seizure(s).

It is important to avoid sudden discontinuation of any anticonvulsant medication. It is also important to have the blood level of the anti-seizure medication measured on a regular basis. When and how often will vary with the type of medication used. Phenobarbital is generally measured 2 weeks after it is started or the dose changed to determine if the dose is in the effective range. Too much phenobarbital is toxic where as too little is ineffective. Potassium Bromide (or KBr) is usually measured 1-2 months after starting it. Regular monitoring of blood levels of both are done on a yearly or semi-yearly basis, or if your dog starts to have seizures while on medication.

There are many anti-seizure medicines available for use. Phenobarbital and KBr are the most commonly used in dogs but if these are not sufficient to control the seizures or the side effects are too severe or prolonged, other drugs can be prescribed by your veterinarian or specialist.

## **Additional Treatments**

Some dogs with seizures are known to have granulomatous meningoencephalitis (GME). This is a disease that causes inflammation in the brain and the tissue coverings around the brain. It is not caused by infection. The only way to make a confirmed diagnosis is with spinal tap and/or CT scan. However, it usually responds well to corticosteroids ("cortisone" or "steroids"). If there is an infection in the brain causing the seizures (meningitis), steroids alone may make the infection worse.

Several infectious diseases can cause seizures. Distemper can migrate to the brain and cause seizures. This can be seen in any age dog though puppies are the most susceptible. Distemper encephalitis is most common in dogs not vaccinated for distemper but can be seen in vaccinated dogs as well. There is no treatment for distemper encephalitis. Ehrlichia is a common tick borne disease in Oklahoma. It too can migrate to the brain and cause seizures. This is commonly treated with antibiotics. Rabies, though rare, can also cause seizures in dogs.

## **Prognosis**

The prognosis is dependent upon the cause. In some cases, the cause cannot be identified so the prognosis is uncertain. In this situation, the frequency and severity of the seizures are monitored to assess progression of the underlying disease process. When a specific cause is identified, a specific treatment will be prescribed.

## **Transmission to Humans**

There are few infectious causes of seizures in dogs that pose a health risk to humans; most notable is rabies. Fortunately, this is very uncommon.

Many owners are bitten by the seizing animal because of a well-intentioned effort to help. Despite the dramatic signs of a seizure, your dog feels no pain, only bewilderment. Dogs do not swallow their tongues. If you put your fingers into its mouth, you will not help the dog and will run a high risk of being severely bitten. **DO NOT PUT YOUR FINGERS IN YOUR DOG'S MOUTH DURING A SEIZURE!** The important thing is to keep the dog from falling and hurting itself. As long as it is on the floor or ground, there is little chance of harm occurring.