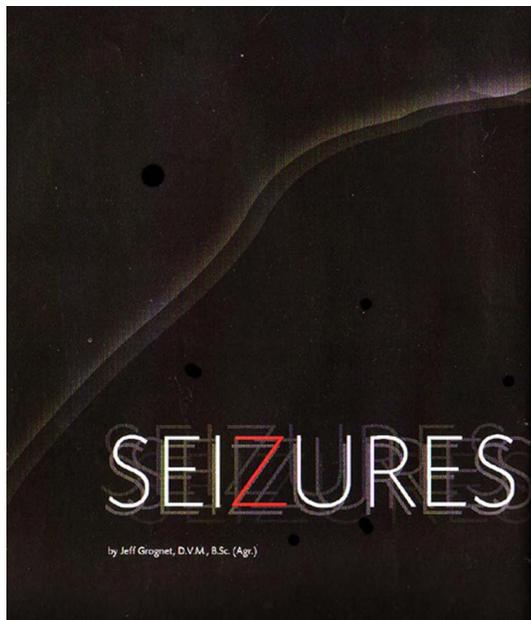


Seizures

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A seizure is a series of uncontrolled muscle spasms. It is triggered by a defect in the brain, which in turn, is caused by an array of disorders both in the brain and the body. In some patients, seizure activity can be eliminated by correcting the underlying problem. In others, owners must make a lifelong commitment to keep their dog's seizures to a minimum with daily medication.

IN A HEALTHY BRAIN filled with millions of neurons (brain cells), electrical impulses are generated and precisely organized, allowing not only thought, but initiation of events in the body, including muscle contractions.

When neurons aren't active, they should be in a state of rest. Some, however, become spontaneously excited without any outward stimulation. The number of neurons that become excited is typically small enough to be kept in balance by those at rest. However, if too many neurons are excited at one time, a flood of electrical current flashes through the brain triggering a seizure, which is visible as uncontrolled muscle contractions.

Seizures tend to follow a predictable cascade of events. The dog gets a glazed-over look in his eyes and his body stiffens. He may fall to one side, typically with all four legs rigid, then pull his head back as his neck muscles spasm. Sometimes his legs thrash violently and he may involuntarily urinate and defecate.

The period of muscle contractions - the ictal phase - usually lasts for only 10 to 20 seconds, but because this episode is so intense, it seems longer to a helpless observer. The pre-ictal phase, which occurs before seizure activity, is a period of disorientation or behavior change that lasts from a few minutes to an hour. The post-ictal phase (after the seizure) is signaled by weakness, blindness, ataxia and stupor. It can take up to 24 hours for a dog to recover fully from a seizure, though most dogs look normal within an hour.

Dogs can exhibit all kinds of seizure activity. Sometimes they are as powerful as those described above. Sometimes dogs just get disoriented and stiff. A few dogs experience "visual" seizures - they act as though they can see flies buzzing around the room.

A dog that seizes repeatedly - one seizure immediately after another - needs prompt treatment. Uncontrolled continuous muscle activity (status epileptics) can raise a dog's body temperature to a level that can permanently harm the brain.

CAUSES AND DIAGNOSIS

Seizures that occur intermittently may or may not need treatment, but the cause does need to be investigated. Do they originate from an imbalance in the body, or are they induced by a primary brain disorder?

A dog with uncontrolled or over-controlled diabetes mellitus can seizure because his brain cells do not get enough sugar. Toxins in the blood (seen with liver and kidney disease), a lack of oxygen due to anemia (seen with immune-mediated hemolytic anemia or ingestion of onions), as well as drugs and insecticides, can all trigger seizures. imbalances of hormones (hypothyroidism) and electrolytes (Addison's disease)

have also been linked to seizure activity.

All these disorders of the body are diagnosed with blood and urine tests. If a disease is identified, rectifying that problem usually resolves the seizures.

If the body of a seizing dog is healthy, the primary problem (by default) is in the brain. A young dog can have a developmental disorder called hydrocephalus, commonly known as water on the brain. An older dog may have a brain tumor. Typically, cancer in the brain originates from other areas of the body. For example, mammary cancer can spread via the blood to the brain.

Meningitis, which is induced by fungal agents (e.g., cryptococcus) or bacteria can trigger seizures. The same occurs with inflammation in brain tissue caused by an overactive immune system (e.g., Pug encephalitis). These diseases can be difficult, or perhaps impossible, to treat. An MRI and CSF tap can help diagnose these disorders in the brain.

After a veterinarian has ruled out all diseases of the brain and body as causes of seizure activity, she labels the seizing patient as an epileptic. Epilepsy appears to have a genetic basis in some individuals (see sidebar). It can be serious enough to require treatment.

MANAGEMENT

The medications used to manage canine seizures vary with the situation and the goal of therapy. If a dog has a single seizure at home, there's usually no need to intervene. The dog just needs a quiet environment to recover from the post-ictal phase. If a dog is in status epilepticus, he needs emergency treatment in a veterinary hospital. Intravenous Valium (or another sedative/anaesthetic) is needed to halt seizure activity.

In cases where dogs have intermittent but clustered seizures, some veterinarians send "Valium kits" home with their clients. The owner gives the Valium after the first seizure to help prevent more from occurring. Valium can be given easily at home by squirting it in the rectum, where it's absorbed rapidly through the rectal wall into the bloodstream.

When a dog is seizing more often than once every four to six weeks, or has severe cluster seizures, daily anticonvulsant therapy is warranted. The decision to use these medication must be made carefully. The dog's owner must be able to reliably give the drugs twice daily. If they are not given on schedule, the dog could go through withdrawal, which might prompt more seizure activity.

Anticonvulsant medications help raise 'seizure threshold.' They change brain chemistry so it is less likely that aberrant excited neurons will stimulate a seizure. Several medications are used, and in many cases they are used together so that lower doses of each drug can be given to minimize drug toxicity.

Most dogs can be stabilized on anticonvulsant medication; however, the caregiver must be able to deal with the expenses associated with treatment and monitoring. More importantly, they must make a commitment to give the medication for the duration of their dog's life.

GENETIC OF EPILEPSY	ANTICONVULSANT MEDICATIONS
<p>Epilepsy has been reported in nearly all breeds of dogs. However, there is an increased risk, and therefore evidence of an inherited basis, in the following breeds: Belgian Shepherd Dog (Tervuren); Beagle; Bernese Mountain Dog; Brittany Spaniel; Cocker Spaniel; Collie; German Shepherd Dog; Golden Retriever; Irish Setter; Keeshond; Labrador Retriever; Poodle (all sizes); Miniature Schnauzer; St. Bernard; and Wire-haired Fox Terrier.</p>	<p>Two oral medications are used routinely to control seizure activity in dogs. Phenobarbital - the standard - works by raising the seizure threshold. It takes effect quickly and blood levels also stabilize quite rapidly, usually within about a month.</p> <p>The other medication, potassium bromide (KBr), takes longer (often months) to reach therapeutic levels. Both medications must be given twice daily, and in some dogs with severe seizure activity, these two medications need to be given concurrently.</p> <p>Over time, phenobarbital and KBr can have a negative effect on the liver, which is signaled by a marked increase in liver enzymes in the patient's blood. For this reason, dogs on anticonvulsants should have periodic blood tests to assess the status of their livers.</p> <p>It is also important to measure blood levels of the medications themselves. The results of these tests tell veterinarian how much leeway they have in adjusting drug dosages. When a dog continues to seizure, his medication dose must be boosted or a second medication must be added the first is already at a maximal blood level (to prevent toxicity).</p>
DEFINITIONS	
<p>Seizure, convulsion. A physical manifestation (muscle activity, sensory disturbances, or loss of consciousness) resulting from abnormal electrical discharges in the brain. Can be triggered by a wide number of factors.</p> <p>Epilepsy. One of the many causes of seizure activity. It's a brain disorder marked by abnormal electrical discharges in the brain and typically manifested by sudden brief episodes of altered or diminished consciousness, involuntary movements, or convulsions.</p>	

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