

Metropolitan Veterinary Hospital

Akron Veterinary Internal Medicine/Oncology Practice

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Seizure Disorders

Client Handout

WHAT IS A SEIZURE?

Any involuntary behavior that occurs abnormally may represent a seizure. Seizures are classified into several categories.

GENERALIZED (GRAND MAL) SEIZURES

This is the most common form of seizure in small animals. The entire body is involved in stiffness and possibly stiffness/contraction cycles (tonic/clonic action). The animal loses consciousness and may urinate or defecate.

PARTIAL SEIZURES

This form of seizure originates from some specific area in the brain and thus involves the activity of a specific region of the body. Partial seizures may generalize to involve the whole body.

PSYCHOMOTOR SEIZURES

This type of seizure is predominantly behavioral with the animal involuntarily howling, snapping, circling, etc. The abnormal behavior may be followed by a generalized seizure.

Seizures (neurologic events) are often difficult to tell from fainting spells (cardiovascular events). Classically, true seizures are preceded by an **aura**, or specific feeling associated with a coming seizure. As animals cannot speak, we usually do not notice any changes associated with the aura. The seizure is typically followed by a **post-ictal period** during which the animal appears disoriented, even blind. This period may last only a few minutes or may last several hours. Fainting animals are usually up and normal within seconds of the spell.

!!! POST-ICTAL DISORIENTATION IS THE HALLMARK OF THE SEIZURE !!!

CAUSES OF SEIZURES AND DIAGNOSTICS

Seizures may be caused by situations within the brain, such as trauma or infection, or by situations centered outside the brain, such as low blood sugar, hypothyroidism, circulating metabolic toxins, or external poisons. The first step is to rule out situations centered outside the brain, easily done with a blood test. An ophthalmic exam may also be performed as the retina may show signs of a brain infection. If these tests are negative, the next step is determined by the age of the pet.

ANIMALS LESS THAN AGE 1 YEAR- Seizures are usually caused by infections of the brain. (Canine distemper would be the classic cause of seizures in a puppy.) Analysis of cerebrospinal fluid, obtained by a tap under anesthesia would be important.

ANIMALS BETWEEN AGES 1 AND 5- In these animals, usually no cause can be found and the term epilepsy, which simply means seizure disorder, is applied. If seizures are occurring frequently enough, medication is used to suppress them.

Schnauzers, Basset hounds, Collies, and Cocker Spaniels have two to three times as much epilepsy as other breeds.

ANIMALS MORE THAN AGE 5 YEARS- In this group, seizures are usually caused by a tumor growing off the skull and pressing on the brain (a meningioma*). Most such tumors are operable if found early. A CAT scan or MRI would be the next step. Specific referral is necessary for this type of imaging. For patients where surgery is not an option, corticosteroids may be used to reduce swelling in the brain. Treatment to suppress seizures may also be needed.

Epilepsy is the name given to seizure disorders for which no cause can be found. It is not a unique disease in and of itself.

Seizures resulting from metabolic problems or toxicity (i.e., when the brain itself is normal) are called **REACTIVE SEIZURES**.

Seizures resulting from an identifiable brain abnormality are called **SECONDARY SEIZURES**.

Seizures for which neither of the above problems apply (i.e., when no cause can be found) are called **PRIMARY SEIZURES**.

MEDICATION TO SUPPRESS SEIZURES: PHENOBARBITAL

Treatment of any seizure disorder is aimed at suppressing the seizure with medication. The drug of choice is Phenobarbital.

WHEN TO BEGIN TREATMENT:

- When seizures occur in clusters, that is, one after the other.
- When isolated seizures occur once a month or more
- When specific circumstances exist regarding how often the animal is observed. (If an animal cannot be observed, there is no way of knowing how frequently its seizures are occurring. It may be best to play it safe.)
- The German Shepard dog, Golden retriever, Irish setter, or Saint Bernard breeds are notorious for difficulty in seizure control. It is best not to wait for frequent seizures in these cases as each seizure makes the next more difficult to control.

WHAT YOU SHOULD KNOW ABOUT PHENOBARBITAL

This medication is a long-acting barbiturate capable of suppressing seizure activity in the brain. It is an inexpensive drug though the monitoring necessary amounts to about \$300.00 a year.

It takes 1 to 2 weeks to build up a blood level capable of suppressing seizures. This means that the effectiveness of a given dose cannot be assessed before this period. After this time, a phenobarbital blood level should be run to determine the effectiveness of the dose being used. Phenobarbital blood levels, once therapeutic, are checked every 6 months or sooner if breakthrough seizures occur.

Twenty to thirty percent of epileptic dogs cannot be controlled with phenobarbital alone. If an animal on phenobarbital continues to seizure, a blood level must be drawn. Before adding other drugs, however, it must be shown that the maximum therapeutic phenobarbital level has been ineffective; most animals are nowhere near the maximum level and simply require a dose higher than what they are receiving. If phenobarbital is simply not effective or has unacceptable side effects, potassium bromide may be used to complement phenobarbital at a lower dose.

Another important part of monitoring regards the toxicity of phenobarbital. This medication can be harmful to the liver thus liver function is periodically checked. A bile acids liver function test and phenobarbital blood level are recommended twice a year.

COMMON SIDE EFFECTS

- **SEDATION**- animals may become quite stuporous as they get used to this drug. This effect is temporary, lasting until the patient's metabolism adjusts (usually no longer than a few days).
- **EXCESSIVE THIRST AND APPETITE**- These side effects are annoying and, unfortunately, permanent if they occur. If these side effects become too objectionable, the phenobarbital dose will have to be lowered and another medication added for seizure control.

WHAT IF PHENOBARBITAL DOESN'T WORK OR CAUSES UNACCEPTABLE SIDE EFFECTS?

This can happen and in such cases, potassium bromide (often abbreviated KBr) becomes the next best choice. The phenobarbital dose is generally cut back and potassium bromide is given at a high dose for a day or two before dropping to a maintenance bromide dose. Potassium bromide is felt to be an investigational treatment by the FDA and special permission is needed to use it; still 85% of phenobarbital failures can be controlled with potassium bromide. Bromides reach therapeutic levels very slowly (months), thus in most cases, bromides and phenobarbital are used in combination. Due to the success of seizure control with potassium bromide, many neurologists begin therapy here instead of with phenobarbital.

SEIZURES AT HOME (WHEN IS IT AN EMERGENCY?)

It is a lucky pet that never has another seizure after beginning medications, but an occasional breakthrough seizure (as disturbing as it may be to watch) is rarely of serious concern. It is important not to put yourself in danger around a seizing pet. You may get bitten during involuntary jaw snapping, and in the period of post ictal disorientation the pet may not recognize you and may snap. There **are**, however, some emergency situations:

- **SEIZURE ACTIVITY NON-STOP FOR 5 MINUTES OR MORE**
- **MORE THAN 3 SEIZURES IN A 24-HOUR PERIOD**

If a particularly bad seizure occurs at home or if either of the above emergencies occur, a special first aid technique can be used: **Rectal administration of valium**. In initial studies the injectable product was delivered rectally with a specific syringe that could be kept at home. The rectal route avoids any danger of being bitten while trying to administer medication. Recently compounding pharmacies have been able to produce valium rectal suppositories which may be easier to use than the syringe method. Rectal valium administration has been used successfully for many years in epileptic children; the technique has adapted well to veterinary patients.

OTHER INFORMATION

* At the 2004 meeting of the American College of Veterinary Internal Medicine, a study by Mikszewski's group from the University of Pennsylvania presented a retrospective study on 171 canine brain tumor cases. They found 46% of tumors to be meningiomas, 17% astrocytomas, 15% oligodendrogliomas, 7% choroid plexus tumors, and 4% were cases of lymphoma arising in the brain. The average age at diagnosis was 9.5 years. Most dogs were mixed breeds but the second most common breed was the Golden retriever (and third most common breed was the Boxer). The most common symptom bringing the dog to the veterinarian was seizures. Enough of the patients studied had abnormalities on chest radiographs or abdominal ultrasound for the researchers to recommend these procedures prior to expensive brain imaging or surgery.