



Memorial-610 Hospital for Animals

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Seizures

The term “Seizure” is used to describe the symptoms or results of abnormal brain function. They are usually seen as abnormal, usually spastic or repetitive, alterations in behavior or movement. When seizures become recurrent, the condition is called epilepsy. Most commonly, they occur without underlying structural cause and are thus called “idiopathic epilepsy.” Many are believed to have a hereditary link. The abnormality in hereditary epilepsy is believed to be at the biochemical level, and thus no physical abnormality exists.

A single seizure is not sufficient for a diagnosis of epilepsy. Epilepsy is a syndrome of recurrent seizures, and they may be of consistent or increasing severity or frequency. It becomes particularly serious when seizures “cluster,” when one seizure sets off another. Epilepsy has no cure, but we can often control the condition well with medication and preserve quality of life. Keep in mind that control means a reduction in seizure activity, not always the absence of seizure activity.

When to initiate daily anticonvulsant therapy is a judgment call. Any patient that has experienced frequent, long duration seizures (major grand mal seizures), multiple episodes in a few hours or days (cluster seizures), or continuous seizure until medically treated (status epilepticus) is a candidate for anticonvulsant therapy. The consequences of such a decision have financial, emotional and time management consequences. Such a decision will have a significant impact on any family’s lifestyle and requires a strong commitment.

Phenobarbital

The drug of choice for daily maintenance therapy to control seizures in both dogs and cats is Phenobarbital. The starting dosage is approximately 1.0 mg/lb every twelve hours. Stable blood levels of phenobarbital are established after 7-14 days of continuous therapy. If seizures are not adequately controlled at this dosage, adjustments

are made increasing up to 2 mg/lb every twelve hours. The goal is to achieve 15-40 µg/ml blood Phenobarbital levels. Blood levels can vary considerably from one dog to the next when given the same oral dose of Phenobarbital. Side effects with Phenobarbital include liver damage and sedation. In addition, some animals may drink more water, urinate more and possibly eat more. Phenobarbital is detoxified by the liver and excreted by the kidneys. Its mode of action is to depress repetitive electrical activity of multinerve networks. Single drug therapy is better than multi-drug therapy. An antiepileptic drug should only be changed once it has proved unsuccessful after the highest possible blood concentration has been reached. Essentially, phenobarbital blood levels must be examined to assure that the maximum possible dosage of the drug is achieved in the animal. Only after this level is confirmed by laboratory testing, and the animal is experiencing breakthrough seizures (i.e. the phenobarbital is not truly preventing seizures) should the drug therapy be changed.

Potassium Bromide

Potassium Bromide is an anticonvulsant that has received a good bit of attention in clinical trials around the world as an “add-on” to Phenobarbital for use in dogs with epilepsy that is hard to control. Recently it has been used as the sole therapy for epilepsy. Bromide was first used in 1957 for the treatment of epilepsy. Interest in bromide decreased rapidly with the development of modern antiepileptic drugs, and it has only recently been reintroduced for the treatment of intractable epilepsy, especially in children. Potassium Bromide is quickly absorbed in the small intestine and is not metabolized by the body. In contrast to other antiepileptics, it does not cause liver damage and reacts with no other drugs.

Combined therapy for refractory seizures is only suitable when the drug of first choice has been given to the limits of its tolerance without success. When maximum dosages of Phenobarbital are not

affording satisfactory seizure control the next best step is to add an additional drug to the therapeutic regimen.

There are a number of problems associated with Potassium Bromide that must be understood and discussed. It is not approved for use in animals (this is an extra-label drug use). It is available only as a reagent grade chemical in powder form. It must be handled with caution because it can be *toxic to man* causing a rather serious skin rash. It can be mixed with water or given in capsule form and administered to patients with food at a dose of approximately 15 mg/lb once daily. It must be given for approximately five weeks to achieve blood therapeutic levels. Potassium bromide is not toxic to the liver, it is excreted unchanged through the kidney, thereby being an especially useful drug when other anticonvulsants have resulted in liver disease. Potassium Bromide may cause sedation as well. The effective blood levels appear to be 0.5 to 1.9 mg/ml in dogs.

Dosage guidelines for Potassium Bromide:

- Initial loading dosage of 200 mg/lb over a 5 day period (40 mg/lb/day)
- Maintenance dosage 15 mg/lb/day
- Reduce the amount of Phenobarbital 25% per month.

Therapy Guidelines

1. The aim of treatment is control - complete remission with minimal side effects - or more realistically, reduced frequency, severity and duration of seizures.
2. There are significant dosage requirements between members of the same species (1 to 1.5 mg/lb is the average for control with Phenobarbital in dogs).
3. Some breeds tend to be more difficult to control - German Shepherd, Saint Bernard, Irish Setter and other (generally large breeds and sporting breeds).
4. Start anticonvulsant therapy when:
 - Seizure frequency, severity, or duration are excessive.

- An animal has experienced status epilepticus.
 - An animal has experienced cluster seizures (life threatening).
 - Owner cannot tolerate seizures.
5. A therapeutic plan must be individualized for each animal.
 6. Switching between anticonvulsants should be done gradually over two weeks or so by adding the new drug and gradually reducing the previous drug.
 7. Liver function should be periodically evaluated by laboratory testing.
 8. If an animal is seizure free for an extended period of time (one year?) it is reasonable to attempt slow removal of the drug.
 9. Successful therapy is heavily dependent on owner education and compliance.
 10. If seizures are “stress” induced, additional anticonvulsant can be given prior to the stressful event.
 11. If a predictable seizure pattern is recognized, additional anticonvulsant can be given prior to the anticipated event and for a few days to abort the attack. This is most useful in recurring cluster seizures.
 12. Nocturnal epileptics, those that seize primarily at night, can be given additional drug at bed time and a smaller dose during the day.
 13. Amphetamines, phenothiazine derivative drugs, ivermectin and organophosphate dips and medications may stimulate seizures in epileptics and should be used with great care.
 14. Estrus (“coming into heat”) has long been known to cause seizures.
 15. New disease processes may alter metabolism or other body functions and temporarily result in loss of seizure control.
 16. Altered diet or change in diet may cause seizures.
 17. Be alert to the possibility of a new and unrelated neurologic problem causing seizures, especially in long term epileptics.