

# Idiopathic Epilepsy

## (Seizure Disorder of Unknown Cause)

### Basics

#### OVERVIEW

- “Idiopathic” is the medical term for a disease or disorder of unknown cause; “epilepsy” is a brain disorder, in which the pet has sudden, recurring attacks, with or without loss of consciousness
- “Idiopathic epilepsy” is a brain disorder characterized by recurrent seizures in the absence of underlying brain lesions or other nervous system signs; it is age-related and assumed to have a genetic basis

#### GENETICS

- Based on pedigree analysis, a genetic basis is suspected in the beagle, Belgian shepherd (Groenendael and Tervuren), Bernese mountain dog, British Alsatian, dachshund, English springer spaniel, Finnish spitz, golden retriever, Keeshond, Irish wolfhound, Italian spinone, Labrador retriever, Shetland sheepdog, standard poodle, and vizsla

#### SIGNALMENT/DESCRIPTION OF PET

##### Species

- Dogs

##### Breed Predilections

- Beagles, all shepherds (German shepherd dog, Australian shepherd, Belgian shepherd), Bernese mountain dogs, boxers, cocker spaniels, collies, border collies, dachshunds, golden retrievers, Irish setters, Irish wolfhounds, Keeshonden, Labrador retrievers, poodles (all sizes), Saint Bernards, Shetland sheepdogs, Siberian huskies, English springer spaniels, Welsh corgis, wirehaired fox terriers

##### Mean Age and Range

- Range—6 months–5 years of age
- Most common age—10 months–3 years of age

##### Predominant Sex

- Males are more likely to have idiopathic epilepsy than females in the Bernese mountain dog

#### SIGNS/OBSERVED CHANGES IN THE PET

- Seizures may be generalized from onset, or have a short aura (focal onset) with rapid generalization of seizure activity; an “aura” is a sensation that precedes a seizure—for example, the pet appears frightened, dazed, seeks attention, or hides
- Presence of an aura is frequent, preceding the generalized seizure activity
- Focal seizures (that is, involve localized areas of the brain) may occur in the Finnish spitz, English springer spaniel, Labrador retriever, vizsla, Belgian shepherd, and standard poodle



- Seizures—most occur while the pet is resting or asleep; often at night or early morning; frequency tends to increase if left untreated; affected pet falls on its side, becomes stiff, chomps its jaw, salivates profusely, urinates, defecates, vocalizes, and paddles with all legs in varying combinations; seizure activity is of short duration (30–90 seconds)
- Behavior following the seizure (known as “post-ictal behavior”)—periods of confusion and disorientation; aimless wandering, compulsive behavior, blindness, pacing; frequent increased thirst (known as “polydipsia”) and increased appetite (known as “polyphagia”); recovery immediate or may take up to 24 hours following the seizure
- Dogs with established epilepsy may have cluster generalized seizures at regular intervals of 1–4 weeks
- No asymmetry should be observed during seizure, such as twitching more pronounced on one side, limb contractions on one side, circling just before or after the seizure
- Physical examination findings generally are normal; pets usually have recovered by time of presentation to the veterinarian; however, the pet may exhibit post-ictal behavior

## CAUSES

- Unknown cause (idiopathic)
- Genetic in some breeds

## RISK FACTORS

- Known epilepsy in the parents

# Treatment

## HEALTH CARE

- Outpatient—recurrence of isolated seizures
- Inpatient—seizure disorder requires constant monitoring; cluster seizures (more than 1 seizure/24 hours) or sudden (acute) repeated or prolonged seizure activity (known as “status epilepticus”); treat early and aggressively
- Initiate treatment at the second generalized seizure, or if sudden (acute) cluster seizures or sudden (acute) repeated or prolonged seizure activity (status epilepticus) occur
- Other treatments: acupuncture, vagus nerve stimulation, transcranial magnetic motor stimulation, gold-wire implants

## ACTIVITY

- Avoid swimming, to prevent drowning

## DIET

- Changes in diet may alter how phenobarbital (a medication used to control seizures) works in the body
- Dogs on long-term (chronic) medications to control seizures (known as “antiepileptic drugs” or “anticonvulsants”) become overweight; add a weight-reducing program as necessary
- Potassium bromide (KBr) treatment to control seizures—pets should have steady levels of salt in their diets to maintain therapeutic levels of KBr in the serum; an increase in salt causes an increase in bromide excretion preferentially over chloride, with subsequent decreased serum KBr levels; alternatively, a decreased salt content leads to increased KBr serum levels
- If the epileptic dog treated with KBr requires a diet change, take into consideration salt content difference
- Avoid salty treats in dogs treated with KBr

# Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

## PHENOBARBITAL

- Traditional first-line drug
- Phenobarbital requires 12–15 days of treatment to reach steady levels in the serum; phenobarbital serum levels

- decrease significantly in the first 6 months of treatment due to activation of certain enzymes in the liver
- Serum levels of phenobarbital should be rechecked every 2 weeks until the optimal dose range is reached

## **POTASSIUM BROMIDE**

- Traditional first-line drug
- KBr requires 3–4 months of treatment to reach steady levels in the serum and levels vary with salt concentration in diet
- May be added to treatment for pets started on phenobarbital that continue to have seizures; the combination of phenobarbital and potassium bromide may have beneficial effects

## **DIAZEPAM**

- To stop ongoing seizures; dogs with cluster seizures or repeated or prolonged seizure activity (status epilepticus)
- In-home treatment—for dogs known to have cluster seizures, as directed by your pet's veterinarian

## **OTHER DRUGS**

- With the use of multiple drugs (known as “polypharmacy”) to control seizures, initiate add-on medications gradually to avoid sedation
- Zonisamide—potential first-line drug; well tolerated; safe to add to phenobarbital; not available in Canada
- Levetiracetam—may see improvement of seizure control and then an increased seizure frequency (“honeymoon effect”); well tolerated; useful in control of focal seizures (that is, involve localized areas of the brain)
- Gabapentin—moderately effective as a medication added to other medications to control seizures (such as phenobarbital); newer medication (pregabalin) may be more effective
- Felbamate; not available in Canada

# **Follow-Up Care**

## **PATIENT MONITORING**

- Serum drug levels—essential to monitor therapeutic levels of drugs in the blood
- Phenobarbital—measure 4 weeks after initiating therapy; adjust oral dose as needed; repeat serum blood level testing every 2 weeks until the optimal serum levels are reached; with long-term (chronic) administration of phenobarbital, monitor bloodwork (complete blood count [CBC], serum chemistry profile, and drug levels) every 6–12 months
- Potassium bromide—measure serum levels (along with phenobarbital levels) 4–6 weeks after initiating treatment and at 3–4 months
- Carefully monitor older dogs with kidney insufficiency that are on KBr treatment
- If the dog treated with KBr requires a diet change, take into consideration salt content difference and monitor drug levels in the serum accordingly

## **PREVENTIONS AND AVOIDANCE**

- Abrupt discontinuation of medication(s) to control seizures may precipitate seizures
- Avoid salty treats in dogs treated with potassium bromide

## **POSSIBLE COMPLICATIONS**

- Recurrent episodes of cluster seizures (more than 1 seizure/24 hours) or repeated or prolonged seizure activity (status epilepticus)
- Dogs receiving phenobarbital and potassium bromide—increased urination (known as “polyuria”), increased thirst (known as “polydipsia”), increased appetite (known as “polyphagia”), and weight gain
- Phenobarbital-induced high serum alkaline phosphatase (“alkaline phosphatase” is a normal enzyme found in several types of cells, including liver cells; increased levels of alkaline phosphatase may indicate abnormal liver function)—occurs frequently; may be an early sign of liver toxicity, but is of less concern if another liver enzyme (alanine aminotransferase [ALT]) on the bloodwork is within the normal range
- Phenobarbital-induced liver toxicity—after long-term (chronic) treatment with high serum phenobarbital levels; may be subtle in onset; the only biochemical abnormality may be a decrease in albumin (a protein in the blood, that is produced by the liver)
- Higher incidence of inflammation of the pancreas (known as “pancreatitis”) in pets treated with phenobarbital

and/or KBr; once pancreatitis develops, recurrence is frequent

- Phenobarbital: rare decreased production of blood cells by the bone marrow (known as “bone-marrow suppression”) with severe low neutrophil count (neutrophils are a specific type of white blood cell that fight infection; low neutrophil count is known as “neutropenia”) and generalized bacterial infection (known as “sepsis”) may develop early in the course of treatment; if occurs, discontinue drug as directed by your pet's veterinarian
- Unexpected hyperexcitability may result with phenobarbital treatment; if occurs, discontinue drug as directed by your pet's veterinarian
- KBr—the pet may be unsteady while managing stairs
- Zonisamide, levetiracetam, or gabapentin as “add-on” medications to control seizures—transient sedation

## **EXPECTED COURSE AND PROGNOSIS**

- Treatment for life
- Some dogs are well controlled with the same drug and dosage for years; others remain poorly controlled despite the use of multiple medications (polypharmacy)
- Pet may develop repeated, prolonged seizure activity (status epilepticus) and die
- Episodes of repeated, prolonged seizure activity (status epilepticus) more frequent in larger dogs; early treatment does not decrease occurrence of status epilepticus
- Normal expected lifespan; however, survival time is shorter if develops repeated, prolonged seizure activity (status epilepticus)
- Medication(s) to control seizures (antiepileptic treatment)—decreases frequency, severity, and length of seizures; perfect control rarely achieved
- Pets may develop lack of response to medications (known as “tolerance”) to control seizures (anticonvulsants) or may not respond to medical treatment

## **Key Points**

- Severe cluster seizures and repeated or prolonged seizure activity (status epilepticus) are life-threatening emergencies requiring immediate veterinary medical attention
- Keep a calendar of the seizures noting date, time, length and severity of the seizures, to assess response to treatment
- Once treatment is instituted, the pet will require medication for life in most cases
- Abrupt withdrawal of medication may cause seizures
- Carefully follow all directions for medications as given by your pet's veterinarian

# CLIENT INFORMATION SHEET

## SEIZURES and EPILEPSY

Seizures occur where there is un-controlled or un-regulated electrical activity in the brain. There are many causes of seizures *including* epilepsy, but not all dogs with seizures have epilepsy.

Signs may include a passing out, falling, paddling, vocalizing, salivation, loss of bowel or bladder control, blindness, twitches and other abnormal behaviors.

Diagnosis is critical before starting pets on medication and will usually involve blood testing specifically to rule out other diseases that commonly cause seizures. Some clients may opt to visit a veterinary neurologist.

Treatment usually means medication like phenobarbital, potassium bromide, CBD oil and other drugs now coming into the veterinary market.

Medication **will not totally stop** seizures but will help to **lessen frequency and severity** of any seizures. Some dogs will still have seizures, but they are usually shorter and milder than prior. Medication generally improves your pet's quality of life and lengthens his or her life as well. Treating other seizure-causing diseases will often end seizure activity, and may eliminate the need for anti-seizure medications.

Medications can cause (mild) side effects although most pets tolerate the medications well and have a much better quality of life.

After starting medications and **your pet will require lifetime medication** and monitoring with regular lab work. (usually every 6 months)

Most pet owners are happy they treat this disease as they will see their pet acting more normally and feeling more comfortable while on the medications.