

# Idiopathic Epilepsy in Dogs

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Seizures, the most common neurologic disorder diagnosed in dogs,<sup>1</sup> are characteristic of epilepsy, which is defined as recurrent seizures over a period of time.<sup>2</sup>

Seizures are clinical manifestations of excess and hypersynchronous electrical activity in the cerebral cortex. The multiple causes of epilepsy include brain tumors, degenerative brain disease, and other brain disorders. Epilepsy affects up to 0.75% of the canine population.<sup>3</sup>

The most common type of epilepsy is idiopathic, or primary, epilepsy. In idiopathic epilepsy (IE), the underlying cause of recurrent seizures is unknown or no identifiable brain disease can be found.<sup>2</sup>

## Signalment

Certain breeds are predisposed to IE, which, based on epidemiologic studies, is thought to have a genetic basis.<sup>4</sup> (See **Breeds Predisposed to Epilepsy**.)

Most IE patients have their first seizure between 1 and 5 years of age, but patients can be older or younger at onset. In one study, 75% of dogs with recurrent seizures at less than 1 year of age

(ie, juvenile epilepsy) had no identifiable brain disease.<sup>1</sup> Another study found no apparent cause for seizures in 35% of dogs with seizure onset at more than 5 years of age (ie, late-onset epilepsy).<sup>1</sup>

## Breeds Predisposed to Epilepsy<sup>1</sup>

- Beagle
- Belgian shepherd dog
- Bernese mountain dog
- Border collie
- Boxer
- Cocker spaniel
- Collie
- Dachshund
- Dalmatian
- English springer spaniel
- Finnish spitz
- German shepherd dog
- Golden retriever
- Irish setter
- Irish wolfhound
- Keeshond
- Labrador retriever
- Lagotto Romagnolo
- Miniature schnauzer
- Nova Scotia duck tolling retriever
- Saint Bernard
- Siberian husky
- Standard poodle
- Vizsla

See **A Personal Perspective on Epilepsy & Client Handout: Explaining Epilepsy** on pages 42 & 43, respectively, or visit [brief.vet/epilepsy-in-pets](http://brief.vet/epilepsy-in-pets)

## Clinical Signs

Seizures are described as generalized or focal. Generalized seizures reflect involvement of both hemispheres of the cerebral cortex, whereas focal seizures indicate abnormal activity in one part of a cerebral hemisphere.<sup>4</sup> Most IE patients display generalized tonic-clonic seizures. During the tonic phase, the patient loses consciousness and falls to one side in opisthotonus with every limb rigid and extended. The clonic phase that follows consists of limb paddling/jerking and chewing movements.<sup>1</sup> Seizures typically have 4 stages: prodrome, preictal, ictus, and postictal.<sup>5</sup> (See **Table 1**.)

## Diagnosis

IE is diagnosed by ruling out all other possible causes of seizures by having a normal neurologic examination, normal lab tests (eg, CBC, serum chemistry, bile acids, thyroid function), a normal brain MRI, and normal spinal fluid analysis.

### TAKE ACTION

- 1 Ensure all team members know the signs of the 4 stages of a seizure and can communicate them clearly to clients.
- 2 Make sure clients know what to expect by carefully explaining that idiopathic epilepsy is not curable and caring for their pet will require a long-term commitment.

## Treatment

Treatment is specific to the patient and based on the veterinarian's familiarity with and access to antiepileptic drugs (AEDs). A recent consensus statement recommends beginning AED therapy<sup>6</sup>:

- When the patient has more than 2 seizures every 6 months
- When cluster seizures are present
- After any episode of status epilepticus
- When the postictal period is prolonged or unusual

The goal of AED therapy is to significantly decrease seizure frequency and severity while minimizing medication side effects. A drug that decreases seizure frequency by at least 50% is considered efficacious. Treatment may include first-line AEDs only or first-line AEDs in conjunction with other anticonvulsant drugs. (See **Table 2**.)

If seizure frequency is unacceptable (ie, >1 per month), additional treatment options are limited to increasing current medication dosages or adding a different AED. Nonmedical therapies (eg, diet changes, acupuncture, vagal nerve stimulators) have also been investigated.<sup>1</sup> While the author does not discourage any strategy to help improve seizure control, these ancillary measures have not been studied extensively, making it difficult to advise a patient's owner on their efficacy. Clients can be instructed to provide supportive care by remaining calm when seizures are occurring to limit injury to the patient and by creating a quiet, dimly lit environment for the recovery.

### Conclusion

IE is not curable, and management requires a long-term commitment from the patient's owner. Approximately 25% of patients with IE will be refractory to one or more anticonvulsant

TABLE  
**1** | Stages of a Seizure

Stage	Description	Signs	Duration
Prodrome	Initial stage	<ul style="list-style-type: none"> <li>Anxiety, irritability, clinginess, somnolence</li> </ul>	<ul style="list-style-type: none"> <li>Hours before the seizure</li> <li>Frequently not apparent to the patient's owner</li> </ul>
Preictal	Beginning of the seizure	<ul style="list-style-type: none"> <li>Vacant stare, slow arching of the head and neck</li> </ul>	<ul style="list-style-type: none"> <li>Seconds to minutes</li> </ul>
Ictus	The visible seizure, often characterized by tonic and clonic phases	<ul style="list-style-type: none"> <li><b>Tonic:</b> Loss of consciousness, opisthotonus, rigid and extended limbs, erratic breathing, loss of bowel and bladder control</li> <li><b>Clonic:</b> Paddling of limbs, chewing movements</li> </ul>	<ul style="list-style-type: none"> <li>Variable (ie, seconds to several minutes or even nonstop)</li> </ul>
Postictal	Period following the seizure	<ul style="list-style-type: none"> <li>Abnormal mentation, pacing, temporary blindness, hunger, ataxia, aggression</li> </ul>	<ul style="list-style-type: none"> <li>Minutes to hours</li> </ul>

TABLE  
**2** | Common Medications for Treatment of Epilepsy

Drug	First-Line Medication	Dose	Side Effects	Therapeutic Monitoring	Therapeutic Range
Bromide	Yes	<b>Loading dose:</b> 125 mg/kg/day PO for 5 days <b>Maintenance dose:</b> 35 mg/kg/day PO	Polyuria, polydipsia, polyphagia, sedation, ataxia, pancreatitis, gastritis (vomiting)	<b>Initial:</b> CBC, serum chemistry, serum drug concentrations 2 weeks after loading <b>Maintenance:</b> Every 6-12 months	1-3 mg/mL
Gabapentin	No	10 mg/kg PO q8h <sup>1</sup>	Sedation, ataxia	None	
Levetiracetam	Yes	20-30 mg/kg PO q8h (regular release) 20-30 mg/kg PO q12h (extended release)	Sedation, ataxia (typically none to mild)	None	
Phenobarbital	Yes	2-3 mg/kg PO q12h	Polyuria, polydipsia, polyphagia, sedation, ataxia, hepatopathy, p450 enzyme induction, bone marrow hypoplasia (rare)	<b>Initial:</b> CBC, serum chemistry, serum drug concentrations in 2-3 weeks <b>Maintenance:</b> Every 6-12 months	10-40 µg/mL This is lab dependent (ie, Antech). Dewey quotes a range of 20-35 µg/mL. <sup>1</sup>
Pregabalin	No	2-4 mg/kg PO q8-12h	Sedation, ataxia	None	
Zonisamide	Yes	10-20 mg/kg PO q12h (per the author's experience)	Decreased appetite, sedation, idiosyncratic hepatic necrosis (rare)	<b>Initial:</b> CBC, serum chemistry in 2-3 weeks <b>Maintenance:</b> Every 6-12 months	

medications.<sup>5</sup> Comorbidities (eg, anxiety, hyperactivity, behavior changes, medication side effects) contribute to a patient's decreased quality of life. Dogs with epilepsy have been reported to have shorter lifespans because, as a result of emotional stress to pet owners, treatment cost, and/or patient quality-of-life concerns, many clients choose euthanasia over long-term treatment.<sup>7</sup> ■

### References

1. Thomas WB, Dewey CW. Seizures and narcolepsy. In: Dewey CW, da Costa RC, eds. *Practical Guide to Canine and Feline Neurology*. 3rd ed. Ames, IA: Wiley Blackwell; 2016:249-267.
2. Mariani CL. Terminology and classification of seizures and epilepsy in veterinary patients. *Top Companion Anim Med*. 2013;28(2):34-41.
3. Packer RM, Volk HA. Epilepsy beyond seizures: a review of the impact of epilepsy and its comorbidities on health-related quality of life in dogs. *Vet Rec*. 2015;177(12):306-315.
4. Berendt M, Farquhar RG, Mandigers PJ, et al. International veterinary epilepsy task force consensus report on epilepsy definition, classification and terminology in companion animals. *BMC Vet Res*. 2015;11(1):182.
5. Thomas WB. Idiopathic epilepsy in dogs and cats. *Vet Clin North Am Small Anim Pract*. 2010;40(1):161-179.
6. Podell M, Volk HA, Berendt M, et al. 2015 ACVIM small animal consensus statement on seizure management in dogs. *J Vet Intern Med*. 2016;30(2):477-490.
7. Berendt M, Gredal H, Ersbøll AK, Alving J. Premature death, risk factors, and life patterns in dogs with epilepsy. *J Vet Intern Med*. 2007;21(4):754-759.

**DAVID BREWER, DVM, DACVIM (Neurology)**, joined Hope Veterinary Specialists in July 2016. He earned his bachelor's degree in biology from East Carolina University in Greenville, North Carolina, and his DVM from North Carolina State University. He received clinical training in small animal medicine and surgery, neurology, and neurosurgery at Cornell University and was awarded the ACVIM Certificate of Neurosurgery in 2014. He has also worked as an emergency and critical care clinician at the Animal Emergency and Referral Hospital in Leesburg, Virginia, and as an associate neurologist/neurosurgeon and residency advisor at Bush Veterinary Neurological Service.

**FUN FACT:** In his free time, Dr. Brewer spends time with his wife, 3 sons, 2 dogs, 1 cat, and 3 horses. He is an avid obstacle course racer.

## A Personal Perspective on Epilepsy

**Cyndie Courtney, DVM**

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What does a seizure feel like? Grand mal seizures don't feel like anything. How do I know? Because I've had 2. The first led to my original diagnosis, and the second occurred when I switched medications to have children, so I speak from personal experience when I discuss a pet's seizure disorder with a client.



Each time I had a seizure, I only realized something was wrong as I came to, surrounded by EMTs. I felt really groggy, but I didn't hurt, and I wasn't scared. The seizures are simply blank spots in my mind, as if I were asleep and woke up from a too-short nap.

Experiencing the seizure is the easy part. What comes afterward is hard.

It's hard seeing the impact of my seizure on the people who watched it. It's hard having to adjust my medication and suffer with grogginess, proprioceptive deficits, or allergic reactions. It's hard knowing my condition could randomly kill me. Fortunately, my epilepsy is well controlled.

I don't speak for every epileptic, and other seizure disorders are different—partial seizures in particular. However, my personal perspective helps when I talk to clients. Here is what I tell them.

- As scary as a grand mal seizure looks, your pet is not in pain.
- It is normal to worry about your pet. This will help you watch closely for seizures and medication side effects. However, you shouldn't let your worry stop your pet from enjoying his or her life.
- While we aim to minimize and decrease seizure severity and frequency, our other goal is to give your pet a good quality of life between seizures.

At the end of the day, veterinary epileptic patients need the same things I cherish most—friends, family, and a great team to help keep them safe, healthy, and loved. ■

# What Should You Do if Your Pet Has a Seizure?

These guidelines are for pets that are already under the care of a veterinarian for a seizure disorder. If your pet is having his or her first seizure or you see something unusual, call your veterinarian immediately.

## What to Do During the Seizure

- Try to stay calm and remember that your pet is not in pain.
- Make sure your pet is in a safe place, ideally on the ground or the floor, away from stairs and anything he or she could bump into.
- Time the seizure, preferably using a watch with a second hand.
- Try to make note of when your pet started to act abnormally, when the active seizure started, when the active seizure ended, when your pet became aware of his or her surroundings, and when your pet seemed to be acting normally again.
- If possible, take a video of the seizure to help your veterinarian better characterize the event.

## What Not to Do

- Do not put your hands near or in your pet's mouth because he or she may bite while in the middle of an active seizure or if he or she is disoriented.
- Do not pick up, cuddle, or hold your pet during a seizure because he or she will likely be disoriented coming out of the seizure and may act aggressively.
- Do not allow children or other pets to approach your pet while he or she is having a seizure.



## Treatment

Depending on your pet's condition and other medications he or she is taking, your veterinarian may recommend medications you can give at home when your pet is having a seizure. The veterinarian's instructions will include the specific medication, dosage, and circumstances under which the medication should be given.

## After the Seizure

- Clean up any urine or feces your pet may have passed during the seizure.
- Write down as much as you can remember about the seizure, focusing on the date, time, length of seizure, and duration of disorientation after the seizure. In addition, describe what your pet was doing before the seizure occurred, what the seizure was like, and how your pet acted afterward.

- Follow your veterinarian's instructions regarding updates on your pet's condition. For more help tracking your pet's condition, consider downloading the Royal Veterinary College's epilepsy tracker app (RVC Pet Epilepsy Tracker), which allows you to keep a medication journal, seizure journal, important contacts, and more.

## Emergency Care

Seek emergency care for your pet if he or she has an active seizure that lasts 5 minutes or if he or she has more than 2 seizures in a 24-hour period.

—Courtesy of Cyndie Courtney, DVM  
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