

Fits and starts: epilepsy part two

Author : Kerry Hall, Luisa de Riso

Categories : [RVNs](#)

Date : December 1, 2010

Kerry Hall BSc(Hons), DipAVN(Surgical), looks at the management of emergency seizing patients and their nursing requirements

IN the previous article (*VN Times* 10.11), seizures were discussed in terms of definitions, when to start treatment, owner expectations and maintenance drug therapy. This article will discuss the emergency management of seizing canine patients.

Arrival of a seizing patient

Prompt treatment is required. Anti-epileptic medications are all POMs and administered under the vet's direction. Note that not all drugs mentioned are licensed for canine use. Have a "seizure box" ready containing the commonly used drugs, agents and equipment for IV catheter placement.

- Remember the ABC: airway, breathing and circulation.
- Oxygen should be administered and equipment kept to hand in case of a "crash" situation. Oxygen can be administered by a flow-by system, nasal prongs or intubation.
- An IV catheter should be placed once the seizure has finished in case of subsequent seizures.
- Rectal temperature to be monitored and controlled as necessary.
- Any blood samples should be drawn as advised by the vet.

- A thorough history must be obtained from the owner, including seizure length, frequency, medications given at home, access to any toxins (including supplements and human and veterinary medications), trauma and any recent abnormal behaviour. Even if the patient is a known epileptic, there are other causes of seizure activity. A number of conditions, such as syncope and vestibular attacks, can be mistaken for seizure activity.

Patients on ‘seizure watch’

- Hospitalise in a high-visibility kennel. The risk of seizing in a well-lit area is preferable to the patient seizing in a dark room, unobserved.
- The patient should ideally be placed in a padded kennel to minimise risk of injury in case of further seizures.
- Identify the patient as on “seizure watch”.
- A clear seizure plan should be written up by the vet in charge of the case and attached to the front of the kennel (to include drug dosages and pre-calculated volumes).
- Anti-seizure medications should be placed near the patient with syringes/needles/heparinised saline readily accessible.
- Diazepam (Diazemuls) should not be pre-drawn in syringes due to the reactivity of the drug with the plastic syringe.
- All seizure medications should be clearly written on the patient’s hospital sheet.

Status epilepticus

It has been suggested that more than 90 per cent of all seizures are probably of less than three minutes’ duration; any seizure genuinely lasting more than three to four minutes should be considered a potential status epilepticus (SE). Patients with idiopathic epilepsy may develop SE due to inadequate anti-epileptic drug therapy, drug tolerance or a recent change in therapy. As seizure activity becomes more prolonged, hyperthermia, hypoxia, cerebral oedema, increased intracranial pressure and brain ischaemia may occur.

Emergency drugs

Emergency anti-seizure drugs to stop/control seizures include benzodiazepines and diazepam, which is the mainstay emergency drug.

- **Diazepam** may be administered IV at a dose of 0.5-1.0mg/ kg and takes two to three minutes to take effect. A higher dose (greater than 2mg/kg) may be required if the patient is on chronic phenobarbital therapy due to increased benzodiazepine clearance. Diazemuls is our preferred formulation for IV administration. Diazepam also comes in a formulation for rectal administration, which can be useful for owners to give at home. In a study by Podell (1995), diazepam per rectal therapy (0.5mg/kg) by owners of dogs with primary epilepsy and generalised cluster seizures was associated with a significant decrease in the number of cluster seizure events in 24 hours. It was also associated with a decrease in the total number of seizure events when compared to an identical time period without such therapy.

Diazepam is relatively short-acting (less than 30 minutes), so a longer-acting agent should also be administered once any blood has been drawn for drug serum concentrations. Diazepam can be repeated a maximum of three times in 24 hours. Tolerance can rapidly develop to oral diazepam in dogs, hence it is not a suitable option for long-term maintenance therapy.

- **Midazolam** (Hypnovel) – if seizures continue, midazolam can be administered at a rate of 0.2mg/kg/IV. Constant-rate infusion (CRI) at 0.3mg/kg/hour in saline can be used if seizures continue (Hartmann's should be avoided due to precipitation with calcium). Again, care should be taken if the patient is receiving potassium bromide therapy due to the resultant wash-out effects of the chloride in saline.

- **Phenobarbital** can be given at a dose of 2mg/kg to 4mg/kg IV every 20-30 minutes to effect (to a maximum dose of 16mg/ kg if the patient is already on oral phenobarbital treatment, or 24mg/kg in patients new to phenobarbital). As the drug may take up to 30 minutes to exert an effect, benzodiazepines can be used in the short-term to control seizures.

- **Levetiracetam** (Keppra) – available in oral and injectable formulations, and may be useful for patients with liver disease or suspected portosystemic shunt. The loading dose is 60mg/kg once in 24 hours or 20mg/kg every eight hours. It may also be administered as a CRI at a suggested dose of 5mg/kg/hour.

- **Propofol** (PropoFlo) – boluses of 1mg/kg to 3mg/kg IV can be given to effect, then start CRI at 1mg/kg/hour to 3mg/kg/ hour to effect. The patient should not be left unsupervised, and should be monitored closely as per the following guidelines.

Nursing patients in SE and/or on CRIs

The extent of nursing care will depend on the degree of patient sedation.

- Monitor temperature – if greater than 40°C initiate active cooling, but monitor to prevent rebound hypothermia.

- Turn recumbent patients four-hourly and use thick bedding to minimise risk of decubitus ulcers and pneumostatic pneumonia.
- Express the bladder/catheterise as necessary. Placement of an indwelling catheter increases the risk of urinary tract infection and all catheters must be strictly aseptically managed.
- Moisten gums as necessary.
- Monitor vitals: heart rate, respiratory rate, pulse rate, pulse oximetry, blood pressure and ECG.
- Intubate and ventilate as necessary.
- Blood samples should be drawn as requested by the vet in charge. These will most likely include samples for serum monitoring and blood glucose in addition to haematological and biochemistry testing. Ideally, samples for serum monitoring should be drawn before any further drugs are administered, to check the cause of the breakthrough seizure is not due to subtherapeutic phenobarbital levels.
- IV fluid therapy may be necessary, depending on the degree of sedation and the patient's ability to eat, body temperature and so on.
- The patient's hospital records should be kept up to date – all “episodes” should be documented, including the therapy given, and response to the therapy recorded.
- **Amendment:** in part one of this article (*VN Times* 10.11), a photograph showed several forms of potassium bromide. We would like to point out that there is only one licensed potassium bromide product in the UK, Libromide (Genitrix). Apologies for any confusion this may have caused.

References and further reading

- Podell M (1995). The use of diazepam per rectum at home for the acute management of cluster seizures in dogs. *JVIM* **8**: 68-74.
- Thomas W B (2010). Idiopathic epilepsy in dogs and cats, *Vet Clin of North Am(Small Anim Prac)* **40**: 161-179.