

Seizure Drug Decision Tree

Rose Krupka Peters, DVM, DACVIM (Neurology)

This is intended to be used for animals with first time seizures that are not already on anticonvulsants. Dogs presenting on anticonvulsants will follow similar principles as outlined below but you will have to take into account other factors like anticonvulsant blood levels, seizure history, recent owner-administered doses, etc.

1. ***Brief, single, and self-limiting?*** If **yes**, then wait and watch.
2. ***Active seizure?*** If **yes**, then give benzodiazepine (0.5mg/kg Diazepam or 0.25-0.5mg/kg Midazolam IV, or 0.25-0.5mg midazolam intranasally, or 1.0mg/kg Diazepam rectally) to interrupt and go to 3.
3. ***Seizure stops within a minute using benzodiazepines?*** If **yes**, go to 4.
If **no**, repeat benzodiazepine and start Phenobarbital loading (*no more than 4mg/kg of Phenobarbital IV Q 20 minutes until 16mg/kg...less drug may be required and loading 16mg/kg at once can cause catastrophic respiratory depression in some patients, so titrate the dose*) and go to 7.
4. ***Was the seizure a single event, brief, and easily controlled?*** If **yes**, go to 1.
If long seizure, cluster event, very violent, or underlying disease is suspected to predispose to seizures, start Phenobarbital 2-3mg/kg IV followed by oral BID and go to 5.
5. ***Further seizures in the 24-48 hours after starting Phenobarbital BID dosing?*** If **yes**, then go to 6.
If **no**, continue Phenobarbital BID.
6. Give a bolus of benzodiazepine IV and 4mg/kg Phenobarbital IV each time the dog has a seizure until full loading is reached (16mg/kg total phenobarbital dose within 12 hours) then continue Phenobarbital 4mg/kg orally BID. ***Are seizures under control after loading?*** If **yes**, continue BID oral Phenobarbital dosing.
If **no**, go to 8.
7. ***Seizure terminates with benzodiazepine doses and Phenobarbital loading?*** If **yes**, continue oral BID Phenobarbital.
If **no**, go to 9.
8. ***Seizure still interrupted by benzodiazepines?*** If **yes**, then start a benzodiazepine CRI (Diazepam 0.2-0.5mg/kg/hour or Midazolam 0.1-0.5mg/kg/hour) and add in Levetiracetam 20-40mg/kg IV Q8H (start with loading dose of 40-60mg/kg IV and continue at 20-40mg/kg Q8H).
If **no**, go to 9.
9. Give Propofol to effect (1-4mg/kg, not to exceed 6mg/kg; *titrate to effect and be prepared to intubate*) and start Propofol CRI (0.1-0.25mg/kg/min, not to exceed 0.6mg/kg/min; *monitor ventilation and perfusion carefully*). Continue Levetiracetam up to 60mg/kg Q8H and Phenobarbital 3-4mg/kg BID-TID while trying to get seizures under control.

******Remember that animals will commonly paddle and sometimes have twitching limb and facial movements when recovering from Propofol. Do not confuse this with continued seizures!***

*****Levetiracetam can be used before Phenobarbital in very young, geriatric, ill/traumatized patients or other patients where sedation side effects are expected to be more profound or unacceptable***

*****Levetiracetam can be used early-on in any patient in whom seizure control is not easily obtained. This can be combined with Phenobarbital loading and then continued only if necessary. It is better to achieve early seizure control than to have to deal with more resistant/ refractory seizures!!***

For all seizure cases, make sure hypoglycemia, electrolyte imbalances, toxins, liver disease, etc is ruled out during the initial phase of cluster/ status seizure control and manage your patient accordingly.