Principles of Therapy of Neurologic Disease

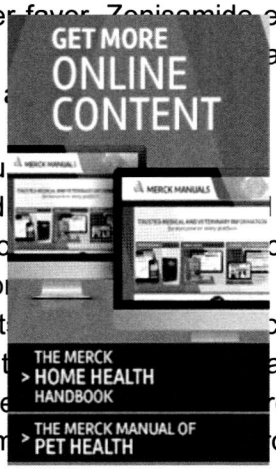
Also see Systemic Pharmacotherapeutics of the Nervous System.

Seizure Control

Status epilepticus (continuous or cluster seizures) in dogs and cats may be interrupted by diazepam, given at 0.5 mg/kg (not to exceed 10 mg at one time), IV. Sodium pentobarbital to effect, not to exceed 3–15 mg/kg, IV, may also be used, followed by phenobarbital at 2–4 mg/kg, IV, every 6 hr. A better alternative is to give propofol as a constant rate infusion at 0.1–0.6 mg/kg/min, followed by a loading dose of phenobarbital (if the animal is not already on phenobarbital) of 2–4 mg/kg IV every 6 hr for a total of four doses. Diazepam given at 0.5–1.0 mg/kg/hr as a constant-rate infusion may be used to control persistent status epilepticus. If the animal has a preexisting hepatic condition that precludes the use of phenobarbital, then levetiracitam 40–60 mg/kg may be given IV, SC,or rectally, resulting in a therapeutic blood level that will persist for 9 hours. Oral anticonvulsants should be resumed as soon as possible if currently being given.

Recommended maintenance anticonvulsant therapy in dogs and cats is phenobarbital at 2–4 mg/kg, PO, bid, as needed to control seizures or to maintain serum levels at 15–40 mcg/mL. Dogs can be treated with potassium bromide (KBr), 22–44 mg/kg given with food until the serum level is 1,500–3,000 mcg/mL. Because KBr has a long half-life, if started at maintanance levels, the steady state therapeutic level will not be reached until 3 mo after initiation of therapy. Phenobarbital may become clinically effective in 72 hr, whereas KBr may take several weeks. The longterm efficacy of phenobarbital and KBr is about the same. However, KBr bypasses the liver, so it is better than phenobarbital in animals with liver disease. Animals taking phenobarbital often have increased liver enzymes and cholesterol levels but decreased thyroid levels; these should be expected and often do not require treatment. KBr has also been linked with megaesophagus and pancreatitis in dogs. Because KBr is not commercially available, it may be prepared by a compounding

pharmacist by mixing KBr crystals in water to give a concentration of 250 mg/mL or by packing the crystals in gelatin capsules. KBr serum levels are affected by the salt content of the diet, so the diet should be consistent; the higher the dietary salt content, the faster the bromide is excreted via the kidneys. KBr has proved more efficacious than phenobarbital in dogs with cluster seizures and for seizures that are difficult to control. Phenobarbital and KBr may be given in combination. Diazepam is not an effective longterm oral anticonvulsant in dogs because of its short half-life; however, a compounding pharmacist can prepare rectal suppositories containing diazepam 0.5–2 mg/kg for home use in dogs with cluster seizures, or the injectable form can be given rectally at 1 mg/kg to prevent trips to emergency clinics. The tertiary anticonvulsants, levetiracitam and zonisamide, are quickly gaining greater favor. Zonisamide especially has shown great efficacy in controlling animals with a poor response to phenobarbital



KBr may cau so its use in cats is no longer recommended mg/kg, PO, bid, may be used in cats with unco cause of its longer half-life in cats; however, in o was associated with fatal hepatic necrosis in cat close monitoring throughout the first few weeks of t al is the anticonvulsant of choice in cats; if seizure rolled, then levetiracitam is added. Acupuncture m ol seizures in all species.

Acute Spinal Cord Injury

Acute spinal cord injury from trauma, intervertebral disc herniation, or fibrocartilaginous embolization resulting in paraplegia must be treated aggressively in dogs to ensure the best chance for recovery. If the animal is seen within the first 8 hr after injury, methylprednisolone sodium succinate or prednisolone sodium succinate is given at 30 mg/kg, IV, followed by 15 mg/kg in 2 and 6 hr, or a constant IV infusion to give a total dose of 60 mg/kg. Steroid use is not advised if it has been longer than 8 hr since the trauma occurred, because there may be more deleterious effects than beneficial ones. Dexamethasone is not used. Oral famotidine at 0.5–1 mg/kg, once or twice daily; cimetidine at 5–10 mg/kg, bid; or misoprostol at 3 mcg/kg, bid, can be used to protect the GI tract. Polyethylene glycol (PEG) 30% solution may be given IV at 2.2 mL/kg, then repeated in 24 hr. PEG is a newer treatment that appears promising. If the injury occurred more than 72 hr before treatment, the benefit of PEG is questionable. For maximal benefit, decompressive spinal surgery should be performed as soon as possible, usually within 24 hr, when indicated.

Anti-Inflammatory Drugs

For control of CNS inflammation in dogs and cats unassociated with a virus or other agent, prednisone at 2 mg/kg/day may be given PO. Oral famotidine at 0.5–1 mg/kg, once or twice daily; cimetidine at 5–10 mg/kg, bid; or misoprostol at 3 mcg/kg, bid, is given to prevent GI irritation. If GI ulcers develop and melena is detected, sucralfate (500 mg for cats and dogs <20 kg; 1 g for dogs >20 kg), PO, tid-qid, is given 2 hr apart from other drugs. NSAIDs should never be given in conjunction with steroids, because GI ulceration is common. The dosages of all steroids given should be slowly tapered; abrupt withdrawal should be avoided. Prednisone can be used as longterm maintenance therapy on alternate days to avoid complete suppression of adrenal function. Other chemotherapeutics used for inflammatory CNS disease such as MUE are cytarabine (50 mg/m^2, SC, bid for 2 days, then repeated at 3–4 wk intervals), mycophenolate (10 mg/kg, PO, bid), and cyclosporine (5 mg/kg, PO, bid).

Antiedema Drugs

After cranial surgery and in animals with brain tumors or head injuries that cause a declining neurologic status, 20% mannitol, 0.5–1 g/kg, may be given slowly IV. Mannitol is not given in spinal cord injuries. Use of methylprednisolone sodium succinate as described above for acute spinal cord injury is no longer recommended for head injuries in people, and its use in the veterinary field is declining. For palliative treatment of brain tumors, oral prednisone may be used.

Muscle Relaxants

Diazepam at 0.5 mg/kg or methocarbamol at 40 mg/kg, PO, tid-qid, relieves muscle spasms from intervertebral disc protrusion and other sources of nerve root irritation.

Antimicrobial Therapy

Refer to discussions of specific infections for antimicrobial therapy recommendations.

Nursing Care

Animals with paraplegia and quadriplegia need intensive nursing care. The animal should be maintained on padding and turned every 4–6 hr to avoid decubital ulcers. The bladder must be expressed or catheterized every 6–8 hr. In paraplegic animals, diazepam may be given to facilitate relaxation of the urinary sphincter, making manual expression of the bladder easier. Urine must be monitored for evidence of cystitis. The skin must be kept clean and free of urine and feces to

prevent dermatitis. Quadriplegic animals may need to be hand fed nutritious food and given plenty of water. Manual extension and flexion of joints and muscle massage will help delay contractures and muscle atrophy in paralyzed limbs.

Last full review/revision July 2013 by Thomas Schubert, DVM, DACVIM, DABVP