

+ EMERGENCY ACTION GUIDELINES

MACROCYCLIC LACTONE POISONING

SUSPECTED/WITNESSED/CONFIRMED INGESTION/DERMAL APPLICATION

ASYMPTOMATIC

GASTROINTESTINAL DECONTAMINATION

INDUCE EMESIS

(If presenting <2 hours following ingestion)

Dogs: Emedog @ 0.1mg/kg SC

Cats: Alpha 2 agonist⁴

ADMINISTER ACTIVATED CHARCOAL (AC) (ORAL OR DERMAL EXPOSURE)

Carbodote Prime: (AC + sodium sulphate), single administration.

Due to enterohepatic recirculation¹⁶ this should be followed by:

Carbodote Repeat: (AC only), every 4-6 hours for 24-48 hours.

(Refer to packaging for instructions on how much to administer)

MONITOR

Suggest hospitalisation for 24 hours to monitor for development of symptoms.

AVERMECTINS/MILBEMYCINS E.G., IVERMECTIN, SELAMECTIN, MOXIDECTIN, MILBEMYCIN, DORAMECTIN, EPRINOMECTIN, ABAMECTIN

Lowest reported toxic doses^{1,2,3}

Ivermectin: 0.1-0.4mg/kg PO in susceptible dogs, 0.2-2.5mg/kg PO non-susceptible dog breeds, 0.3-1.3mg/kg SC cats

Moxidectin: 0.09-1mg/kg PO in susceptible dogs, 1.9-2.8mg/kg PO in non-susceptible dog breeds

Clinical signs: May occur within 2-24 hours

Neurological manifestations predominate: ataxia, hyperaesthesia, vocalisation, mydriasis, disorientation, blindness (typically temporary), paresis, respiratory paralysis, tremors, seizures, coma

Also: Hypersalivation, bradycardia, vomiting, dyspnoea, hypothermia or hyperthermia

DERMAL DECONTAMINATION

!If symptomatic, ensure tremors are controlled first as handling may potentiate tremor or seizure activity!

- Wear gloves and bathe the patient with lukewarm water and washing up liquid
- Dry after bathing to avoid hypothermia
- If necessary, clip the fur to ensure adequate decontamination
- Use a buster collar to prevent oral ingestion from coat/skin

SYMPTOMATIC

CONTROL MUSCLE TREMORS⁵

Methocarbamol @ 55-220mg/kg IV @ rate no more than 2ml/min (maximum dose 330mg/kg/day IV as it can cause respiratory muscle depression)

IV route preferred, however can be given PO or IR (note: delayed action via these routes).

- 20-45mg/kg PO q8h (do not exceed 330mg/kg/day)⁶
- 100-150mg/kg crushed and administered with water rectally, repeated q4-8hrs as required.

Ziapam (diazepam) @ 0.5-2.0mg/kg IV

CARE: Benzodiazepines and Barbiturates may exacerbate seizures/CNS depression^{1,2,7,8}.

If proceed, do so with caution. Consider lower doses, monitor closely, avoid if deterioration

CONTROL SEIZURES^{5,7}

Ziapam (diazepam) @ 0.5mg/kg IV bolus (up to 3 doses at least 10 minutes apart)

Phenobarbital @12mg/kg loading dose slow IV. If required, 4-6mg/kg slow IV 20 mins later (max 2 doses, 20min apart)

Propofol @ Bolus of 1-4mg/kg to effect followed by CRI of 0.1-0.4mg/kg/min

+/- gaseous anaesthesia

INTRAVENOUS LIPID EMULSION^{9,10}

(obtain baseline blood samples first)

Intralipid 20% @ 1.5ml/kg IV bolus over 1-5 minutes, followed by CRI @ 0.25ml/kg/min over 30-60 minutes. Can be repeated 1-2 times if no improvement

(note: efficacy of lipid soluble anti-seizure medications may be reduced by ILE)

CONSIDER GASTRIC LAVAGE

(once seizures under control if appropriate)

+ ADMINISTER ACTIVATED CHARCOAL via stomach tube (care aspiration risk)

RECOVERY

- Slowly withdraw anticonvulsant medication, monitoring for responsiveness to external stimuli and recurrence of tremor/seizure activity
- Reduce the propofol/inhalant anaesthetic dose by 25% every 2 hours until the patient is completely weaned and seizure free
- Paddling of legs may occur during recovery due to drug withdrawal or seizure activity. Salivation and orofacial muscle twitching are suggestive of seizure activity, whilst paddling should stop once the patient is placed in sternal recumbency if it is due to drug withdrawal
- To help manage marked agitation/paddling consider⁶:
 - a bolus of either dexmedetomidine or medetomidine 1 µg/kg IV⁶ or acepromazine 5µg/kg IV

THIS DOCUMENT IS INTENDED FOR USE AS A GUIDELINE ONLY. DOSES ARE REFERENCED AS AT THE PUBLICATION DATE. INDIVIDUAL CASES AND TOXIC DOSES MAY VARY.

LABORATORY SAMPLES

Baseline blood samples usually non-specific

- Increased CK (due to increased muscle activity)
- Possible evidence of dehydration and azotaemia
- Hypoglycaemia may be present if tremors/seizures are prolonged

Acid-base status may reveal respiratory acidosis due to hypoventilation

Urinalysis can help to distinguish pre-renal and renal azotaemia. Myoglobinuria may be present from long lasting seizure activity and this could lead to acute renal failure

Toxicological testing can be performed on: blood, gastric contents or source material

MACROCYCLIC LACTONES KEY FACTS

- Toxicosis may occur following ingestion of large animal deworming products or contaminated faeces, or through inappropriate exposure to topical products
- Toxic dose varies according to: route of exposure, the patient and their genetics
 - Collies and other herding breeds commonly have P-glycoprotein dysfunction, (a defect in the MDRI gene), making them more susceptible
- Elimination half-lives: ivermectin = 2 days; moxidectin = 19 days²

Prognosis

- Favourable with supportive care,
- Severely affected patients may require prolonged medical and nursing care (full recovery may be 2-3 weeks)
- Guarded if the ivermectin dose received is >5mg/kg²

+ USEFUL CONTACTS

DÔMES PHARMA

Your partner in poisoning.

www.domespharma.co.uk | T 0800 0385868 | E help@domespharma.com

VETERINARY PATHOLOGY GROUP

Toxicology testing.

www.thevpg.co.uk | T 0113 2870175

VETERINARY POISONS INFORMATION SERVICE (VPIS)

Dedicated poisoning information service.

www.vpisglobal.com | T 0207 30 55 055

TOX BOX/ELIXIR SERVICE

Immediate access to emergency poisoning products.

www.vpisglobal.com | T 0207 30 55 055

+ PRODUCTS

EMEDOG

- Veterinary licensed apomorphine for dogs
- Packs of 5 or 20x 1ml vials, with a 4-year, unopened shelf life

ZIAPAM

- The first veterinary licensed injectable diazepam for dogs and cats
- Packs contain 6 x 2ml vials of 5mg/ml



+ DON'T FORGET ACTIVATED CHARCOAL!

- Activated charcoal helps in the adsorption of multiple undesirable substances⁶
- Available as liquid or gel
- Repeated administrations will be required for substances that are enterohepatically recycled
- Take a look at our range of activated charcoals

THE
CARBODOTE
RANGE

Carbodote is a complementary feed.

THE
ANTI-TOX
RANGE
BE PREPARED FOR POISONING

TO FIND OUT MORE ABOUT THE ANTI-TOX RANGE FROM DÔMES PHARMA,
VISIT **WWW.DOMESPHARMA.CO.UK**

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PHARMA

Emedog, 1 mg/ml, solution for injection for dogs contains Apomorphine. Legal category [POM-V]. For the induction of emesis in dogs. Ziapam 5mg/ml solution for injection for cats and dogs contains Diazepam. Legal category [POM-V]. In cats and dogs for the short-term management for convulsive disorders and skeletal muscle spasms of central and peripheral origin. As part of a pre-anaesthetic or sedation guidelines. Use Medicines Responsibly. www.noah.co.uk/responsible.

For further information and to view the full Summary of Product Characteristics, please contact TVM-UK Animal Health Ltd, Kirtlington Business Centre, Slade Farm, Kirtlington, Oxfordshire, UK. OX5 3JA. Tel. 0800 0385868. Email help@domespharma.co.uk. Dômes Pharma is the trading name of TVM UK Animal Health Ltd. Prescription decisions are for the person issuing the prescription alone.

Reference: 1. Merola VM, Eubig, PA. (2012). Toxicology of Avermectins and Milbemycins (Macrocyclic lactones) and the role of P-glycoprotein in dogs and cats. Vet Clin North Am Small Anim Pract. 42(2): 313-vii. 2. Platt S, Garosi L (2012) Small Animal Neurological Emergencies (1st edn). Chp 28; Pp 509 &517 3. Mealey K.L. (2013). Ivermectin; Macrolide Antiparasitic Agents. Small Animal Toxicology (3rd edn). Chp 52; Pp 601-607. 4. Harvey A, Tasker, S (eds.) (2013) BSAVA Manual of Feline Practice. Gloucester: British Small Animal Veterinary Association Pp.139. 5. Platt S.R., Olby N.J (2004) Neurological emergencies. In: Platt SR, Olby NJ (eds). BSAVA Manual of Canine and Feline Neurology (3rd edn). BSAVA, Gloucester, Pp P333-P335. 6. Allerton, F. (2023) Small Animal Formulary, 11th Edition. Part A: Canine and Feline. British Small Animal Veterinary Association. 7. BSAVA/VPIS (2012) Guide to Common Canine and Feline Poisons. 8. Hopper K., et al. (2002) Ivermectin Toxicity in 17 Collies. J Vet Intern Med, Volume 16, Issue 1, Pp 89-94. 9. Robben J.H., Dijkman M.A. (2017) Lipid Therapy for Intoxications. Vet Clin Small Anim: 47; 435-450. 10. Londono L.A., et al. (2017) Clearance of plasma ivermectin with single pass lipid dialysis in 2 dogs. Journal of Veterinary Emergency and Critical Care 27(2), Pp 232-237. 11. TVM329CarbAd