

+ EMERGENCY ACTION GUIDELINES

NICOTINE
POISONING

THE FACTS

NICOTINE CONTAINING PRODUCTS INCLUDE CHEWING TOBACCO, BIDIS, CIGARETTES, CIGARS, NICOTINE REPLACEMENT PRODUCTS (PATCHES, GUM, E-CIGARETTES, E-LIQUID REFILLS)

Toxic doses:

- Toxic dose of nicotine is unclear. Clinical signs have been reported as low as 1mg/kg^{1,2}
- Canine (oral) LD50: 9-12 mg/kg¹ *
- A typical cigarette contains 9-30mg nicotine (average cigarette 15-20mg)³
- E-liquids are available in various flavours (making them appealing to pets) and various strengths of nicotine (3-36mg/ml). The highest strength legally available in the UK is 20mg/ml²
- Cigarette butts may also cause intoxication

Some products may expose pets to other harmful toxins¹

- Xylitol can be found in nicotine gum
- E-cigarettes contain lithium-ion batteries which may also be chewed or swallowed
- E-cigarette casings can result in oral injury and pose a risk of foreign body obstruction²

TREATMENT IS AIMED AT REMOVING THE SOURCE OF NICOTINE, LIMITING ABSORPTION AND SUPPORTIVE CARE

THE ASYMPTOMATIC PATIENT

INDUCE EMESIS

IN CASE OF RECENT INGESTION AND UNALTERED MENTAL STATUS

Nicotine is an emetic so vomiting may have already occurred¹

Dogs: Emedog @ 0.1mg/kg SC

Cats: alpha 2 agonist⁸



ADMINISTER ACTIVATED CHARCOAL (AC)

IF NO CONTRAINDICATIONS

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

If ingestion of sustained-release products (e.g. transdermal patches - discarded patches can still have high nicotine concentration), this should be followed by:

Carbodote Repeat: (AC only), orally every 4-6 hrs for 24 hrs (Refer to packaging for instructions on how much to administer).

EXPOSURE TYPE

ORAL EXPOSURE: Rinse mouth with water

OCULAR EXPOSURE: Copiously irrigate eyes with water or saline for at least 20 minutes⁶

DERMAL EXPOSURE: Nicotine is absorbed through skin - bathe with soapy water⁶

PHARMACOKINETICS

- Nicotine, an alkaloid, binds to nicotinic acetylcholine receptors (nAChRs) found in both the peripheral and central nervous system
- It causes cholinergic effects, with CNS stimulation, followed by depression⁴
- Nicotine is absorbed slowly in the acidic gastric environment, but well absorbed in the small intestine (alkaline environment)^{1,3}
- It is also readily absorbed through the respiratory tract, skin and mucous membranes³
- Metabolised by the liver
- Elimination via the kidneys - excretion is enhanced by a low urinary pH³

* LD50 (median lethal dose) is the amount of a substance that causes mortality in 50% of a group of animals.

THE SYMPTOMATIC PATIENT

CLINICAL SIGNS^{1,2,6}

- **Clinical signs are dose dependent**
- **Rapid onset within 15-30 mins, may be delayed up to 4 hours²**

Gastrointestinal signs

- Throat irritation, vomiting (common shortly after ingestion), salivation, diarrhoea

Neurological signs

- CNS stimulation followed by depression is common
- Hyperexcitability, disorientation, ataxia, weakness, mydriasis, tremors, seizures (rare)

Cardiopulmonary signs

- Hyper- / hypotension, tachycardia, reflex bradycardia, tachypnoea, cyanosis, respiratory depression.
- Pericardial effusion has been reported in one case⁵

SUPPORTIVE CARE AND MONITORING

1. **IV fluids** if hypotension: Administer IV crystalloids
IV fluids may also speed up elimination of nicotine from the kidneys¹ (fluid diuresis is not recommended due to risk of fluid overload)
2. **Anti-emetics** (as needed): Care with Metoclopramide as may speed up gastric emptying and enhance nicotine absorption⁵
3. **Diazepam (Ziapam)** if tremors (0.5-2mg/kg IV) or seizures (0.5mg/kg IV up to 3 times, 10 mins apart)
4. **Supplemental oxygen** may be necessary if respiratory distress
5. **Cardiovascular support:** Caution with cardiac medications - tachycardia can switch to bradycardia
Atropine 0.01-0.03mg/kg IV as needed for bradycardia⁷
Beta-blockers (e.g. Propranolol 0.02-0.08mg/kg slow IV) for tachycardia⁷
6. **Urine acidification** may increase excretion as long as the patient is not acidotic³
7. **Surgical consideration:** Endoscopic retrieval of extended-release nicotine patches to prevent further absorption¹

Antacids should be avoided as they may enhance nicotine absorption (by increasing gastric pH)

Monitor vitals closely including pulse, respiratory rate, blood pressure, ECG and CNS status. A blood screen/urinalysis may be appropriate to rule out underlying conditions e.g. renal disease which may prolong recovery

Toxicological analysis of serum, urine, or vomit is available but rarely useful due to the need for prompt diagnosis and management⁶

PROGNOSIS

- Excellent to poor prognosis depending on dose ingested. If high dose ingested, prognosis improves if the animal survives the first four hours (nicotine has a short half-life - approx. 2 hours in humans)^{2,3}
- Recovery usually occurs within a few hours; up to 24 hours if exposed to a high dose²
- Young or geriatric patients and those with pre-existing renal or cardiovascular disease may be more severely affected¹

+ 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**

DP | DÔMES
PHARMA

Carbodote is a complementary feed. **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 of 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. *Registered trademark of Dômes Pharma Group Companies.
References: **1.** Hovda, L. R. et al. Chapter 46: Nicotine and Tobacco. Blackwell's Five Minute Veterinary Consult Clinical Companion: Small Animal Toxicology, Second Edition. s.l.: John Wiley & Sons, Inc., 2016. **2.** Bates, N and Talcott, P. Electronic cigarettes. Vetlexicon. [Online] <https://www.vetlexicon.com/canis/toxicology/articles/electronic-cigarettes/>. ISSN 2398-2942. **3.** The dangers of nicotine ingestion in dogs. Hackendahl, N C and Sereda, C W. s.l.: Toxicology Brief, 2004. **4.** BSAVA, VPIS. Nicotine exposure in dogs. BSAVA/VPIS Guide to Common Canine and Feline Poisons. s.l.: British Small Animal Veterinary Association, 2017. **5.** Kim, J H. Acute fatal pericardial effusion induced by accidental ingestion of cigarette butts in a dog. 2016. **6.** E-cigs: toxic threat to dogs. El Bahri, L. s.l.: Vet Times, 2015. **7.** Allerton, F. Small Animal Formulary, 11th Edition. Part A: Canine and Feline. s.l.: British Small Animal Veterinary Association, 2023. **8.** Harvey, A, Tasker, S (eds.). BSAVA Manual of Feline Practice. s.l.: British Small Animal Veterinary Association, 2013, p. 139.

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.