

+ EMERGENCY ACTION GUIDELINES

LILY POISONING

SUSPECTED/CONFIRMED/WITNESSED INGESTION

TRUE LILIES NEPHROTOXIC TO CATS

LILIUM AND HEMEROCALLIS SP.		CLINICAL SIGNS 1-36 HOURS POST-INGESTION ^{1,2,3}	
Easter/Trumpet lily	Day lily	• Salivation	• Polyuria
Stargazer/Oriental lily	Royal lily	• GIT irritation	• Polydipsia
Western/Wood lily	Panther lily	• Vomiting	• Oliguria → Anuria
Japanese Show lily	Rubrum lily	• Anorexia	• Pancreatitis
Tiger lily	Leopard lily	• Lethargy	• Hepatic lipidosis
Asiatic lily	Devil lily	• Depression	• Seizures
Yellow lily	White lily	• Dehydration	• Death (3-7 days)
Madonna lily	Turk's cap lily		

TRUE LILIES MAY CAUSE GIT UPSET IN **DOGS**

HYBRID LILIES TOXIC TO DOGS & CATS

COMMON NAME*	CLINICAL SIGNS (CODED) ALL MAY CAUSE GIT UPSET ±
Peruvian lily (a+b) Peace lily (a+b) Calla lily (a+b) Impala Lily (c) Lily of the valley (c+d) Clivia Lily (c+d) Barbados Lily (c+d) Glory lily (c,d,e)	a) Oral pain/Stomatitis (rarely dysphagia or dyspnoea) b) Dermatitis/Allergic dermal reaction c) Cardiac: hypotension, cardiac arrhythmia/arrest d) Neurological: tremors/seizures e) Bone marrow suppression
*There can be many alternative names	

STOP INGESTION & DECONTAMINATE

1. Brush off pollen with a dry disposable cloth/paper towel
2. Clipping may be helpful for cats with heavy contamination
3. Wash coat and paws thoroughly, or wipe with a damp cloth

ADMINISTER ACTIVATED CHARCOAL (AC)

Carbodote Prime: (AC + sodium sulphate), single administration.
Due to unknown toxicant and potential for gastrointestinal persistence/ enterohepatic recirculation⁵, 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)

APPROACH TO NEPHROTOXIC LILY INGESTION IN CATS

TAKE BASELINE BLOODS → POSSIBLE AKI LABORATORY CHANGES

Bloods:
<18 hours → initially only a stress leukogram may be observed
24-72 hours → renal function can start to deteriorate → often moderate to severe increases in BUN, creatinine, SDMA, phosphorus, and potassium
>48hrs → May develop increases in AST + ALT, likely due to pronounced anorexia → hepatic stress → hepatic lipidosis
Urine: (aberrations here can precede changes in blood biochemistry)
>12 hours → isosthenuria, proteinuria, haematuria, glycosuria and numerous renal tubular epithelial casts¹³

PREVENTION AND TREATMENT OF AKI

1. Discontinue any concurrent nephrotoxic drugs
2. Place IV catheter if not already done so (consider jugular catheter to facilitate measurement of CVP and repeated blood sampling)
3. Start IVFT ASAP with isotonic crystalloid (e.g., Hartmann's) initially at 2-3x maintenance¹. Calculate and adjust fluid rate appropriate to patient's needs to maintain hydration, support renal blood flow and GFR. **48-72 hours of timely fluid diuresis can prevent lethal effects¹**
4. Place urinary catheter if possible and monitor urine output (UOP) via closed collection system (normal UOP = 1-2ml/kg/h). This will help with early identification of olig/anuria and tailoring of IVFT requirements (matching 'ins & outs')
5. Serial (at least daily) monitoring of: BP, haematology, biochemistry (especially renal parameters and electrolytes) and ideally acid base status → treat disturbances
6. Drugs, such as furosemide and mannitol have NOT proven to be effective in the treatment of Lily induced anuric renal failure¹²

INDUCE EMESIS

Dogs: Emedog @ 0.1mg/kg SC
Cats: Alpha 2 agonist⁴
(If no contraindications and further gastric evacuation is required)

OTHER TREATMENT CONSIDERATIONS AS NECESSARY

GIT	MISC
• Maintain hydration and blood pressure • Gastroprotectants • Antiemetics • Analgesia • Dietary support	• O ₂ ± IPPV • Monitor and regulate temperature • Monitor CBC/Biochemistry → depending on severity of clinical signs • Acid base status • Manage the recumbent patient
SEIZURES	CARDIAC
Ziapam (diazepam) @ 0.5mg/kg IV repeated up to three times 10 min apart.	• ECG and blood pressure • Anti-arrhythmic drug(s)

OUTCOME FOR CATS

Good to excellent prognostic indicators:
• Early presentation, decontamination and prompt IVFT (<18 hours)
• Present with only GIT signs
• Following a minimum of 48-72 hours fluid therapy, if stable and no signs of kidney injury → Discharge
Poor to grave prognostic indicators:
• Delayed presentation or implementation of treatment (>18 hours¹³)
• Reduction in UOP as kidney injury advances
• Development of anuria → peritoneal dialysis/haemodialysis are the only option^{2,6}, otherwise strongly consider euthanasia
• Chronic renal insufficiency may occur as a long-term consequence

NEPHROTOXIC LILY FACTS

- All parts of the true Lily plants (Lilium sp. and Hemerocallis sp.) are nephrotoxic to cats
- CARE! Many plants are called "lilies" but are not true lilies, yet still may be toxic in other ways
- Lily-induced nephrotoxic syndrome has only been observed in cats, not dogs
- Cats are extremely sensitive – even small ingestions can result in AKI/death
- The true Lily toxin is unknown and therefore undetectable
- Toxin elimination appears to occur within 2 days

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.

+ 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

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. Fitzgerald KT (2010) TOPICAL REVIEW: Lily Toxicity in the Cat. Published by Elsevier. 2. Hall JO (2007) Nephrotoxicity of Easter Lily (Lilium longiflorum). In: Poisonous Plants: Global Research and Solutions. 271-278. 3. Rumbelha WK et al. (2004) A comprehensive study of Easter lily poisoning in cats. J Vet Diagn Invest., 16(6):527-41. 4. Harvey, A, Tasker, S (eds.) (2013) BSAVA Manual of Feline Practice. Gloucester: British Small Animal Veterinary Association Pp. 139. Little, S. (ed) (2012) 5. Bennett, A. J., & Reineke, E. L. (2013). Outcome following gastrointestinal tract decontamination and intravenous fluid diuresis in cats with known lily ingestion: 25 cases (2001-2010). Journal of the American Veterinary Medical Association, 242(8), 1110-1116. 6. Berg RL, et al. (2007) Resolution of acute kidney injury in a cat after lily (Lilium longiflorum) intoxication. J Vet Int Med 21(4):857-859. 7. TVM329CarbAd.