

SAVING PETS' LIVES, 24 HOURS A DAY, 7 DAYS A WEEK

PET POISON **HELPLINE**



Nationwide®

Pets vs Toxic Plants: How to Tilt the Balance to Favor Your Patient

April 2, 2019

Susan Holland, DVM

Associate Veterinarian, Clinical Toxicology

Pet Poison Helpline

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What is Pet Poison Helpline?

- 24/7 animal poison control center
- Veterinary & human expertise
 - 20+ DVMs, 75+ CVTs
 - DABVT, DABT
 - DACVECC
 - DACVIM
 - 10 PharmDs
 - 2 MDs
- Case fee of \$59 includes
 - Unlimited consultation
 - Fax or email of case report
- Educational center
 - Free webinars (archived)
 - Tox tools
 - Wheel of Vomit
 - Pot of Poisons (toxic plants)
 - Textbook
 - iPhone app
 - Newsletters for vet professionals
 - Free resources for clinics
 - Videos
 - Electronic material
 - Clings

Email us for info!



SAVING PETS' LIVES, 24 HOURS A DAY, 7 DAYS A WEEK

PET POISON HELPLINE

Pet Poison Helpline® and Nationwide®



Nationwide® & PET POISON HELPLINE® working together

- Shared mission in highlighting the importance of preparing for accidents and poisonings in small animals
- Addressing the cost of veterinary care Nationwide® covers the \$59 Pet Poison Helpline® fee when an insured pet is brought in to your hospital for care
- Enabling best medicine
Pet owners with Nationwide® spend twice as much on their pets than those without pet insurance



Pet Insurance

With more than 35 years of experience protecting pets, there's nothing we haven't seen...

Accidents & injuries

- ✓ Poisonings
- ✓ Sprains
- ✓ ACL ruptures

Common illnesses

- ✓ Ear infections
- ✓ Vomiting
- ✓ Diarrhea

Serious illnesses

- ✓ Cancer
- ✓ Heart disease
- ✓ Diabetes

Chronic illnesses

- ✓ Allergies
- ✓ Arthritis
- ✓ Skin conditions

Hereditary conditions

- ✓ Hip dysplasia
- ✓ Eye disorders
- ✓ Blood disorders

Testing & diagnostics

- ✓ X-rays, MRIs, CT scans
- ✓ Ultrasounds
- ✓ Blood tests

Procedures

- ✓ Surgeries
- ✓ Endoscopies
- ✓ Chemotherapy

Holistic & alternative

- ✓ Acupuncture
- ✓ Chiropractic
- ✓ Laser therapy

Wellness

- ✓ Vaccinations
- ✓ Flea/heartworm
- ✓ Spay/neuter

Available plans



whole petSM
with wellness
90% back on veterinary bills

- Accidents & illnesses
- Hereditary & congenital
- Cancer
- Use any vet
- Specialty & ER coverage included
- Dental diseases
- Eye, musculoskeletal & blood disorders
- Behavioral treatments
- Rx therapeutic diets & supplements
- Alternative & holistic treatments
- Wellness

\$250 annual deductible
unlimited annual maximum

\$67.70/mo.*

[View coverage details](#)



major medicalSM
Set benefits for accidents,
illnesses & hereditary conditions

- Set benefit amounts
- Accidents & illnesses
- Limited hereditary coverage
- Cancer
- Use any vet
- Specialty & ER coverage included

\$250 annual deductible
unlimited annual maximum

\$34.25/mo.*

[View coverage details](#)



wellness basicSM
Coverage for shots, flea
control & more

- Exams, shots, flea, testing
- No deductible
- Use any vet



Add 25% more coverage

\$400 annual maximum

\$17.75/mo.*

[View coverage details](#)

Speaker Introduction



Susan Holland, DVM,

*Associate Veterinarian,
Clinical Toxicology*

Pet Poison Helpline

Lecture Goals and Plan

Azalea/ Rhododendron

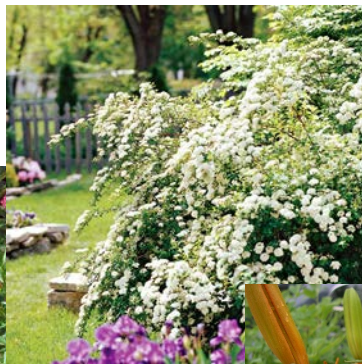
Cyanogenic Plants

- Understand risk of toxicity to pet animals following exposure
- Review the clinical signs including onset and duration
- Discuss treatment recommendations and prognosis



**Case Studies involving (4) PPH
“Frequent Flyer” toxic Plant Exposures**

Can you identify this plant?

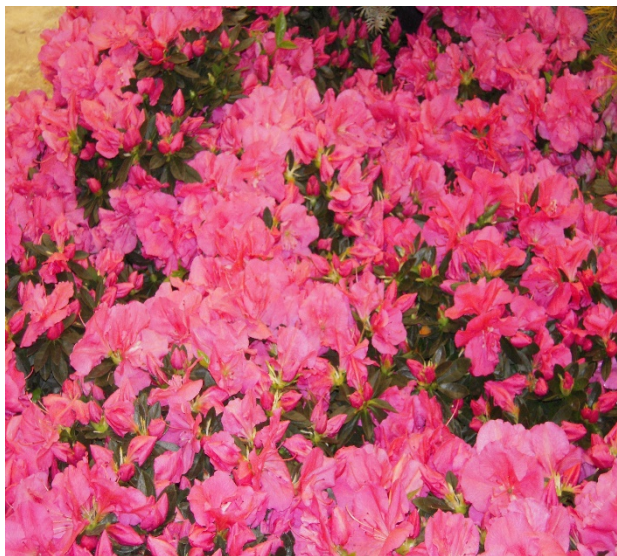


- Identification of the plant(s) is necessary to evaluate the risk of toxicity for your patient.

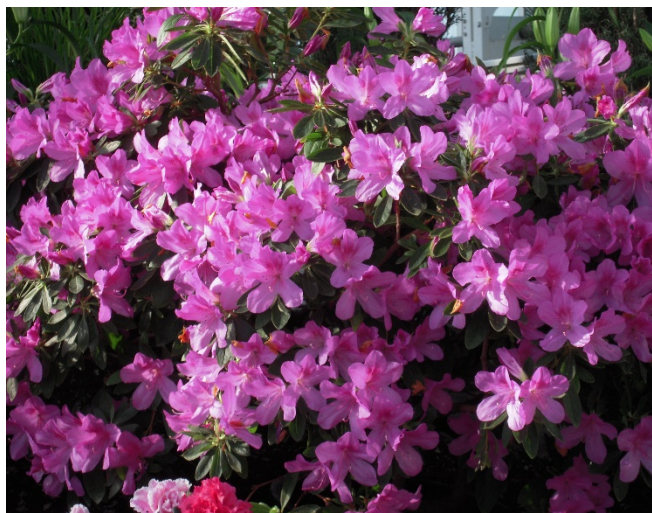


Methods of identification

- Owner identification of plant
- Veterinary professional identification of plant
- Local retail garden center
- County extension agency/ Master Gardeners
- Plant identification app
- State University Agriculture/ Horticulture Departments



Azalea



Rhododendron

Azalea / Rhododendron

- family *Ericaceae*
- Shrubs and small trees with showy flowers
- Azaleas are deciduous and may be purchased potted for indoor use; rhododendrons, Japanese Pieris, and mountain-laurels are evergreen.

Azalea / Rhododendron

- Also includes Mountain-laurel and Japanese Pieris

Mountain-laurel



Japanese Pieris

Azalea / Rhododendron

- Toxin: Ericaceous Diterpenoids (includes Grayanotoxins/Glycosides)
- All parts of the plant including nectar contain toxins
- MOA: Ericaceous diterpenoids bind to voltage gated sodium ion channels, located in neuronal, myocyte, and glial cells, rendering the channels slow to open and slow to close. Persistent cell depolarization occurs.
- MOA: Toxic stimulation of cholinergic receptors

	Cholinergic Effects Mnemonic
D	-iarrhea
U	-rination
M	-iosis/ Muscle weakness
B	-ronchorrhea
B	-radycardia
E	-mesis
L	-acrimation
S	-alivation

Azalea / Rhododendron

Risk for Toxicity : Dog or Cat

- Low for ingestion of 1 – 2 leaves or flowers
- Moderate for ingestion of large volume of leaves/ flowers



Azalea / Rhododendron

Clinical signs, Likely
Hypersalivation
Vomiting
Abdominal Pain
Diarrhea

Clinical signs, Rare	
Bradycardia	Transient Blindness
AV Block/ Dysrhythmia	Seizure
Hypotension	Reflex tachycardia
Weakness	Cardiac Arrest

- Onset of Clinical Signs: usually within hours of ingestion, but potential for delayed onset (12 hours)
- Duration: hours to days

Azalea / Rhododendron

Pet Poison Helpline Data: 3/2009 to 3/2019

Non-Human Cases: Azalea/ Rhododendron Exposures

- 587 calls: 413 Dogs, 155 Cats, 19 other species (rabbit, pig, goat)
- *No reported cases with clinical sign of death*
- *No reported cases with clinical sign of hypotension*
- (3) reported cases with clinical signs of dysrhythmia/ bradycardia, but the reported clinical signs were not reliably corroborated by attending veterinarian or correlated with time of ingestion.
- (5) reported cases with clinical signs of seizure (single/discrete and multiple episodes - acute)
- Gastrointestinal symptoms predominated with Emesis (281 cases), Diarrhea (68 cases), Abdominal pain (5 cases), and Hypersalivation (37 cases).



Azalea / Rhododendron

Treatment : Asymptomatic patient: Oral exposure or Dermal exposure to Nectar

- Asymptomatic patient: Emesis induction if ingestion is w/in 2 hours or unknown time of ingestion
- Bathe if dermal exposure to nectar
- Antiemetic post emesis
- Asymptomatic patient: Activated charcoal with sorbitol 1gm/kg po x 1
- SQ fluids
- Monitor x 10 – 12 hours in clinic for gastrointestinal/ cardiac clinical signs

Azalea / Rhododendron

Treatment : Symptomatic patient

- Antiemetic prn
- Gastric lavage if large volume of plant ingested with radiographic evidence of retention
- Activated charcoal +/-Sorbitol 1gm/kg x 1 when emesis is controlled
- IV Fluids
- Monitor HR/BP/ ECG
- Lab work: Monitor Electrolytes including K/ Ca/ Mg, PCV/ TS
- GI supportive therapy: Bland diet/ Metronidazole for diarrhea
- Atropine 0.02 – 0.04 mg/kg IV for Bradycardia: HR < 50 or severe AV block
- Anticonvulsant therapy (Benzodiazepine, Levetiracetam, Phenobarbital) prn for control of active seizures

Cyanogenic Plants

- Family *Rosaceae*
- *Prunus* sp: Common names: Almond, Apricot, Black Cherry, Cherry, Cherry Laurel, Chokecherry, Flowering Cherry, Peach, Plum
- “Stone fruits” have fleshy pulp encircling a single hardened shell (pit) containing the fruit seed



Cherry
Laurel



Black Cherry



Doughnut Peach w/Pit

Cyanogenic Plants



Elderberry



Hydrangea

- Family *Rosaceae*
Malus sp: Apple, Crabapple
- Family *Adoxaceae*
Sambucus sp: Common name:
Elderberries
- Family *Hydrangeaceae*
Hydrangea sp:
Common name: Hydrangea
- Family *Berberidaceae*
Nandina sp: Common name:
Heavenly Bamboo

Cyanogenic Plants

- Toxin: Amygdalin (*Prunus* sp), Prunasin (*Sambucus* sp, Rosaceae), Hydracyanosides (*Hydrandrea* sp) - cyanogenic glycosides
- Free cyanide is toxic to **all living tissue**; therefore, for plant survival cyanide is contained in vacuolated, glycosides found in seeds, foliage, stems and/or roots/tubers.
- MOA: Release of toxic Hydrogen Cyanide is a multi-step process involving plant enzyme Emulsin to hydrolyze the glycoside. Enzymatic degradation of cyanogenic glycosides occurs optimally at dilute GI pH and with assistance of GI microbes present in ruminant species.



Cyanogenic Plants

- MOA: CN reversibly inhibits a multi-unit structure called cytochrome c oxidase or Complex IV of the electron transport chain located in the mitochondria. One unit, Iron containing heme compound A-3, preferentially binds to CN. This blocks electron transfer necessary for the reduction of oxygen to water and generation of ATP. Chemical asphyxiation occurs as aerobic metabolism is halted.
- **Animals have the ability to metabolize cyanide via conversion by enzyme Rhodanese in the liver to non-toxic thiocyanate. Thiocyanate is excreted via kidneys. This process is overwhelmed during cyanide toxicity**
- MOA: Tissue hypoxia without hypoxemia resulting in classic cherry red mucus membranes indicating lack of oxygen extraction, lactic acid production, metabolic acidosis

Cyanogenic Plants



- Risk for Toxicity: Dog or Cat
- *Prunus* or *Malus* sp: Fruit Pit ingestion: Very Low for cyanide toxicity. Risk for FBO dependent upon size of patient and number/ size of fruit pit ingested
- **Exception: Apricot seeds, which may contain elevated amount of amygdalin, have been reported to cause cyanide toxicity in adults and children.**
 - Dalkiran T, Kandur Y, Ozaslan M, Acipayam C, Olgar S. [Role of Hemodialysis in the Management of Cyanide Intoxication From Apricot Kernels in a 3-Year-Old Child.](#) *Pediatr Emerg Care.* 2018 Nov 5.
 - Konstantatos A, Shiv Kumar M, Burrell A, et al. [An unusual presentation of chronic cyanide toxicity from self-prescribed apricot kernel extract.](#) *BMJ Case Rep.* 2017 Sep 11;2017.
 - Sauer H, Wollny C, Oster I, et al. [Severe cyanide poisoning from an alternative medicine treatment with amygdalin and apricot kernels in a 4-year-old child.](#) *Wien Med Wochenschr.* 2015 May;165(9-10):185-8.



“There is a considerable risk of serious adverse effects from cyanide poisoning after laetrile or amygdalin, especially after oral ingestion. The risk–benefit balance of laetrile or amygdalin as a treatment for cancer is therefore **unambiguously negative.**”

Milazzo S, Horneber M, Ernst E. Laetrile treatment for cancer. Cochrane Database of Systematic Reviews 2015, Issue 4. Art. No.: CD005476. DOI: 10.1002/14651858.CD005476.pub4

Cyanogenic Plants

Risk for Toxicity: Dog or Cat

- *Prunus* sp: **Fresh, wet** leaves/ stems: Moderate risk for cyanide toxicity if large volume is ingested
- *Sambucus* sp: **Fresh** berries/ foliage: Low risk for cyanide toxicity. Moderate risk for vomiting, diarrhea secondary to irritant terpenoids.
- *Sambucus* sp: **Cooked** berries/ juice/tea: No risk for toxicity
- *Hydrangea*: Flower/Foliage ingestion: Very Low risk for cyanide toxicity. Risk for vomiting and diarrhea if large volumes ingested. Potential for contact allergic dermatitis with dermal exposure



Oakleaf hydrangea



Cyanogenic Plants

Clinical signs , Likely

None

Mild to moderate GI distress (raw elderberry/hydrangea flower)

Clinical signs, Rarely

Hyperthermia

CNS: Weakness, Ataxia, Seizure, Recumbency

CV: Bright Red Mucus Membranes, Bright Cherry Color to Blood, Dysrhythmia:
Atrial Fibrillation, Cardiac Arrest

RESP: Hyperventilation, Tachypnea/Dyspnea, Pulmonary Edema, Resp. Failure

GI: Hypersalivation, Vomiting, Diarrhea, Abdominal pain

Lab Work: Metabolic Acidosis with elevated lactate

Cyanogenic Plants

- Onset to Clinical Signs: RAPID: Usually within 10 – 60 minutes following ingestion
- Duration of Clinical Signs: Until administration of antidotal therapy or death



Nandina or
Heavenly
Bamboo

Cyanogenic Plants

Pet Poison Helpline Data 2014 to present



- 570 Cyanide related exposures
- 460 exposures: Cherry pit ingestion
- 94 exposures: Other cyanogenic fruit pit/seed ingestion
- Remaining exposures: Other cyanide source
- (1) symptomatic animal case: exposure to CN gas from coyote trap

Benson, K. (2018, October). *Cyanide, Cyanogenic Plant Glycosides*. Lecture to PPH Veterinary Technicians, Bloomington, MN.

Cyanogenic Plants

Treatment: Asymptomatic Patient with stone fruit pit or seed ingestion

(not Apricot Kernels)

- Induce emesis for retrieval of stone fruit pit ONLY if patient at risk for FBO

Treatment: Asymptomatic Patient ingesting large volume Hydrangea flowers/foilage

- Induce emesis
- Antiemetic
- Supportive therapy for diarrhea (bland diet, metronidazole) prn
- Irrigate and Monitor exposure sites (nasal planum, lips, interdigital) for contact dermatitis

Cyanogenic Plants

**Treatment: Asymptomatic Patient ingesting large volume wet/
Fresh *Prunus* foliage or > 1- 2 Apricot seed/Kernels**

- Induce emesis
- Antiemetic post emesis
- Activated charcoal with sorbitol x 1 dose
- Fluid therapy
- Monitor in hospital for CV and Neurological clinical signs x 10 – 12 hours



Cyanogenic Plants

Treatment: Symptomatic Patient

- Unlikely to encounter due to rapid advancement of symptoms to death
- Establish airway, supplemental O₂, mechanical or manual ventilation
- No emesis induction or A/C/C due to risk for aspiration
- IV Fluids as cardiovascularly tolerated to maintain normotension
 - SX Patients are at risk for non-cardiogenic pulmonary edema*
- Anticonvulsants prn
- Confirmatory lab work: Metabolic acidosis, plasma lactate > 8mmol/L, serum cyanide level

Cyanogenic Plants

- Antidote: Hydroxocobalamin: FDA approved for human use 2006:
 - MOA: Cyanide binds preferentially to hydroxocobalamin forming cyanocobalamin (Vitamin B12)
 - Liver is able to safely metabolize cyanocobalamin
 - Adverse reaction: Temporary reddening of skin, plasma, and urine.
 - Dose: Dog: 70 - 140mg/kg IV over 7.5 min once
- Antidote: Cyanide Two Step Kit: Sodium Nitrite administered IV over 3 – 4 minutes followed by Sodium Thiosulfate administered IV over 30 minutes
 - MOA: Nitrite oxidized iron in hemoglobin to form methemoglobin which preferentially attracts cyanide from cytochrome c oxidase to form cyanmethemoglobin.
 - Mitochondria are freed to return to aerobic metabolism
 - Additional released cyanide is bound to donated sulfhydryl from Sodium thiosulfate to form thiocyanate, a product that is excreted by the kidneys
 - Adverse reaction: Nitrite-induced vasodilation and hypotension, methemoglobinemia with further reduction in oxygen carrying capacity

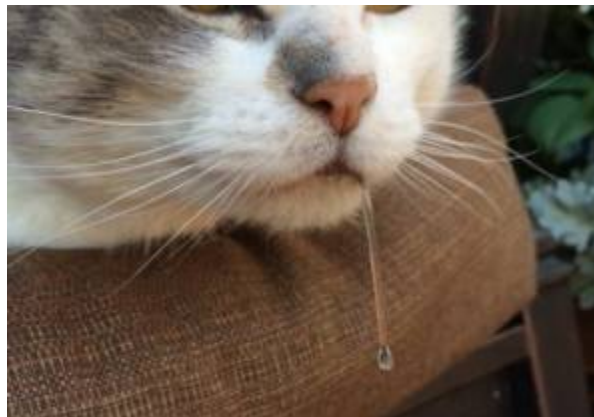
Case #1

“Tigger” 3y, M/N, DSH, 5kg.

No PMHx of dz.

UTD on vaccines, parasite preventative and viral testing. Indoor only.

Normal until (1) hour ago. Escaped into owner’s greenhouse and was discovered drooling and retching.



Physical exam: Unremarkable Temperature, RR. HR mildly elevated.
Normal thoracic auscultation. Soft abdomen to palpation.
Appropriate mental status and ambulatory. Copious hypersalivation.

Case # 1



Caladium



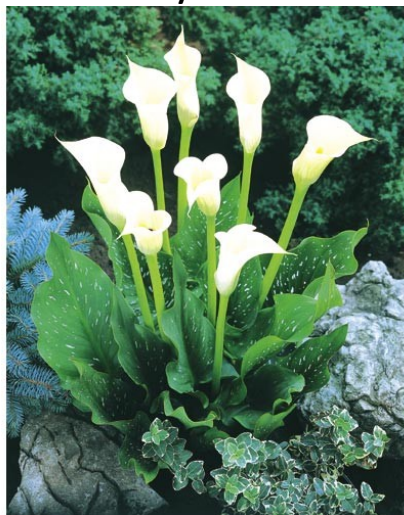
Philodendron

What common toxin do
all these plants share?



Golden pothos or Devil's Ivy

Calla lily



Schefflera (Umbrella
plant)

Anthurium



Case #1

DX: Oral exposure to Toxic Plant: Insoluble Calcium Oxalate

Low order of toxicity

Plant cell walls contain needle-like, bundled calcium oxalate crystals. When chewed the crystals are released into the pet's oral cavity causing mechanical injury to oral tissue and exposing injured cells to chemical injury by histamine, oxalic acid, and prostaglandins.

Oral exposure clinical signs: hypersalivation, acute oral pain with pawing at mouth, vocalization,
Vomiting, anorexia

Oral irrigation with water and/or milk is advised

Analgesic prn

Case # 1

DX: Oral exposure to Toxic Plant: Insoluble Calcium Oxalate

Antiemetic

Fluid therapy prn

Ocular exposure clinical signs: photophobia/ blepharospasm/ potential ulceration. Patients with ocular clinical signs should receive ocular irrigation x 5 min and ophthalmic exam with fluorescein stain.

Systemic toxicity is UNEXPECTED. RARE reported respiratory distress and death from Dumb Cane exposure.



Dieffenbachia or Dumb Cane



Case # 2



“Penelope”, 18 m, F/S,
Goldendoodle, 22kg
PMHx: Non obstructive FB and diet
indiscretion
UTD on vaccines and parasite
preventatives
Indoor/ Outdoor (dog door) 1-acre
yard with invisible fence.



Owner is on the phone stating she planted 300 daffodil bulbs this AM. Within the past hour Penelope has unearthed $\frac{1}{4}$ - $\frac{1}{2}$ of the garden bed and consumed an unknown number of daffodil bulbs. Penelope is asymptomatic. Does she require veterinary intervention for this exposure?

Case # 2



daffodil

DX: Oral exposure to Toxic Plant: Narcissus group

Daffodil, Paperwhite, Amaryllis, Jonquil and Narcissus are common members of Narcissus group

Leaves, stems, flowers, and bulbs contain phenanthridine alkaloids, in particular lycorine, a strong emetic, and clinical sign of **severe emesis** is anticipated.

Additional plant toxin includes Insoluble Calcium Oxalate found in highest concentration in bulbs

Clinical signs, Common: Severe emesis, hematemesis, hypersalivation, abdominal pain, diarrhea

Clinical signs, Rare: Respiratory distress, hypotension, ataxia, tremor, seizure



Case # 2

DX: Oral exposure to Toxic Plant: Narcissus group



Amaryllis



Narcissus

Emesis induction IF patient is not vomiting spontaneously

Antiemetic post gastric emptying

GI supportive therapies: Proton Pump Inhibitor/
Bland diet/ Metronidazole prn

Fluid therapy

Analgesic prn – Not NSAID



Nationwide®

Case # 3

“Ava Gabor” 13 y, F/S, Siamese, 4 kg
PMHx: IRIS CKD Stage 1, HTN
Med: Amlodipine 0.625mg daily
Diet: Prescriptive renal diet, UTD RV only,
Sole pet in household

**WITNESSED INGESTING WATER FROM
VASE CONTAINING LILY BOUQUET 1
HOUR PRIOR TO PRESENTATION**



CVT exam: T102.2, HR 190, RR 36, appropriate “spicy” behavior,
hypersalivation, vocalizing, pawing at her mouth

Case # 3

TOXIC : True Lilies & Day lily

NOT Renal Toxic: Imposter Lilies



Asiatic



Day



Tiger



Easter



Japanese



Oriental



Calla



Peace



Water



Peruvian

Case # 3

DX: Oral exposure to True Lilies: *Lilium sp.* or *Emmerocallis sp* (?)

Ingestion of pollen, flower, leaf, stem, vase water, or bulb is toxic to cats

Oral exposure: Progression of clinical signs: Early : Salivation and emesis within hours
12 – 24 hours post ingestion - severe polyuria. If untreated, polyuria leads to
fulminant dehydration, anuria, azotemia and ARF within 30 – 72 hours.

Bathe patient if dermal exposure to pollen

Emesis induction: For recent ingestion (less than 2 hours) of flower/ leaf/ stem ingestion

****in hospital only – Dexdomitor 3.5 mcg/kg IV or 7mcg/kg IM once**

Case # 3

DX: Oral exposure to True Lilies: *Lilium* or *Heimerocallis* sp (?)

Antiemetic/ Activated Charcoal with Sorbitol 1 gm/kg po once

Lab Work: Baseline PCV/TS/Electrolyte/Renal values/ U/A with recheck values q 24 x 48 hrs. minimum

****crystalluria does not occur in lily toxicity**

IV fluids: 2.5X mtn x 48 hours minimum

Several False/ Imposter lilies are toxic plants, but they do not lead to Acute Renal Failure

Dogs MAY develop mild GI distress from True lily ingestion but will not develop ARF



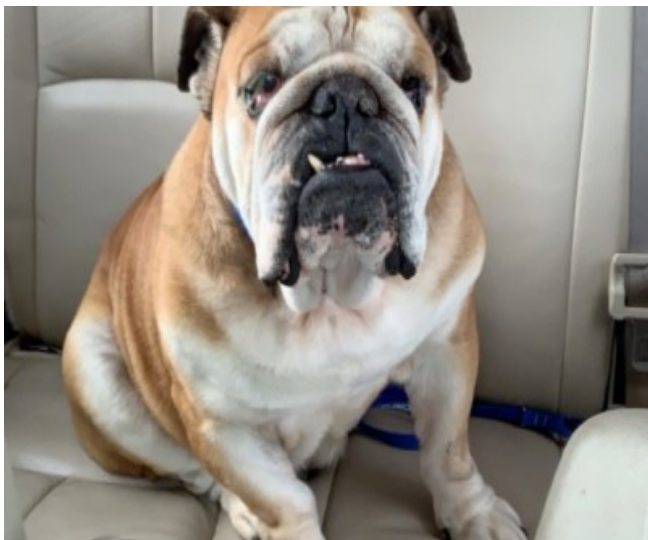
Case # 3

IMPOSTER LILY



Confirmed DX: Oral exposure to Calla lily:
Insoluble Calcium Oxalate

Case # 4



“Gronk” 8 y, M/N, English

Bulldog, 32 kg

PMHx: Bilateral hip dysplasia,

Entropion corrective Sx,

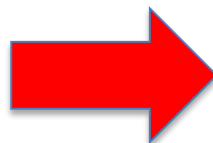
Brachycephalic syndrome, Atopy.

Meds: Apoquel, Galliprant, Joint Supplement

UTD preventative care



Owner has forwarded a cellphone photo of her neighbor’s plant. Gronk was chewing upon the greenery 30 minutes ago. He seems OK. Does she need to bring him in for care?



Case # 4

Cycad: Cardboard Palm



DX: Oral exposure to Cycad: *Zamia* sp

Cycad family include: Sago palm (*Cycas cirinalis*), Japanese cycad (*Cycas revoluta*), Coontie palm (*Zamia pumila*), Cardboard palm (*Zamia furfuracea*)

Toxins: (1) Cycasin: Metabolized in GIT to hepatotoxic, teratogenic, carcinogenic, and GI irritant compound. (2) Beta-methylamino-L-alanine and (3) unidentified high molecular wt. compound neurotoxins

Primary Targets of Toxicity for Dog: Liver, Gastrointestinal tract

ALL parts of the plant contain toxins. Seeds and roots contain highest amount of toxins.

Case # 4



Cycad: Sago palm

DX: Oral exposure to Cycad: *Zamia* sp

Cycad toxicity has been reported in multiple species including dogs, cattle, sheep, rodents, non-human primates, and humans. *Cycad ingestion is presumptively suspected toxic to cats.*

Clinical signs: DOG: Vomiting, Lethargy, Diarrhea, Melena or Hematochezia within 15 minutes to 4 hours of ingestion

Clinical signs: Elevation in liver values/ bilirubin may not occur for 48 – 72 hours post ingestion

ALL exposed patients merit aggressive inpatient decontamination

Induce emesis for recent ingestion (within 2 hours) followed by multiple dose Activated Charcoal administration

Case # 4



Cycad:
Coontie
Palm

DX: Oral exposure to Cycad: *Zamia* sp

Baseline lab work: CBC/ Chemistry/ Electrolytes – additional lab work (blood gas, coagulation testing) for symptomatic patients
Recheck full lab work daily x 72 hours minimum

Supportive therapy: Antiemetics, IV Fluids and prn PPI

Hepatoprotectants (Denamarin, N-acetyl cysteine)

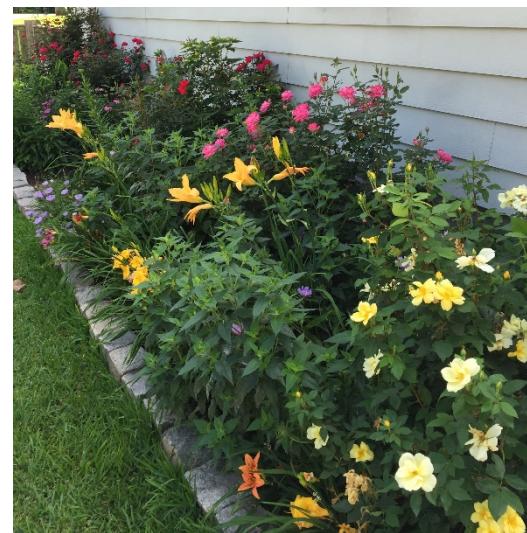
Prognosis is good for patients that maintain normal liver values up to 72 hours post ingestion

Prognosis is guarded for patients that survive acute hepatotoxicity due to potential development of chronic hepatic fibrosis/ death.





Questions?



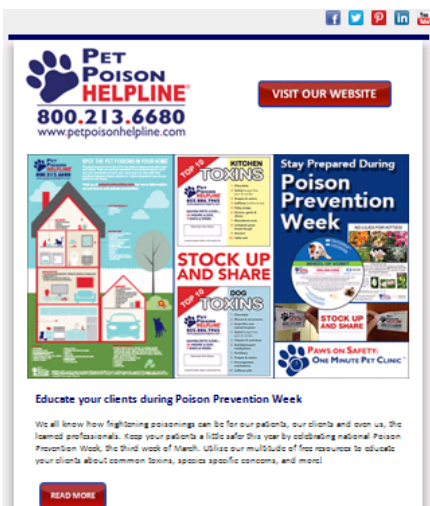
For further information on toxic plants:

From Indoors to Out: Plants Poisonous to Small Animals April 1, 2014

- Ahna Brutlag, DVM, MS, DABT, DABVT
- <https://www.petpoisonhelpline.com/webinar/indoors-plants-poisonous-pets/>
- Archived Webinar available on demand for (1) hour RACE approved CE

Thank you to Dr. Lynn Hovda for providing many of the plant photographs included in this webinar!

Sign up for...



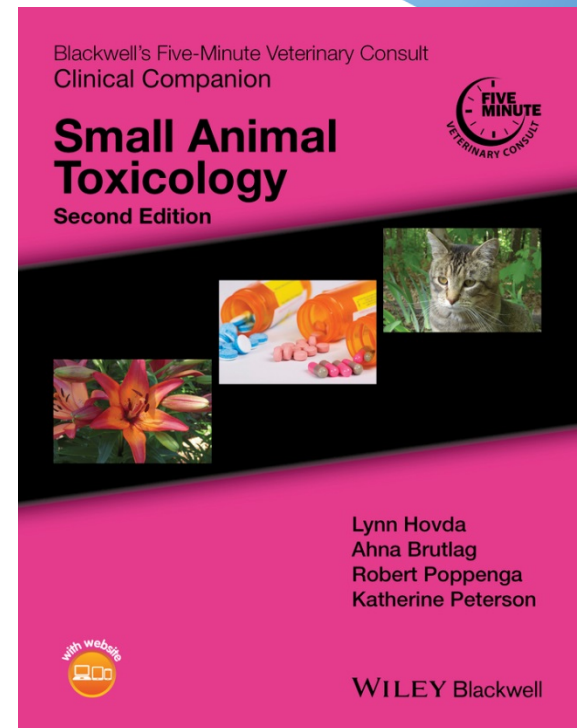
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Small Animal Toxicology

2nd Edition

Drs. Lynn Hovda, Ahna Brutlag, Robert Poppenga, Katherine Peterson

- Provides concise, bulleted information focused on the most important facts needed when treating a poisoned cat or dog
- Carefully organized for ease of use in an emergency, with important toxicants arranged alphabetically within categories
- Details clinically relevant information on the most common toxicants encountered by small animals
- Presents a wealth of color photographs to aid in plant identification
- Includes 14 new topics to this edition covering cyclosporine A, sleep aids, tacrolimus, bath salts, synthetic marijuana, poisonous lizards, imidacloprid, spring bulbs, and sodium monofluoroacetate



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<https://www.petpoisonhelpline.com/careers/>

Questions? Contact us at:
careers@safetycall.com



Upcoming Webinars

June 4th – The Fungus Among Us: Mushroom Poisoning in Cats & Dogs

September 17th - Pot & Pets: Updates on Cannabis Exposure in Dogs & Cats

November 19th - Overview of Rodenticide Classes and Therapy Needs



Thank you for attending!

CE credit FAQs

1. **When will I get my CE certificate?** Now! You can download it directly from the On24 platform.
2. **I attended the webinar but wasn't the person who logged in. Can I still get interactive CE credit?** Yes. Send your name and email address to info@petpoisonhelpline.com by **1pm central time on April 3rd, 2018** (strict deadline).
3. **Can I watch the recorded webinar online for CE credit?** Yes. You can receive non-interactive CE credit. Go to the "For Vets" page on our website, www.petpoisonhelpline.com for more info.

Comments? Questions? Email us! info@petpoisonhelpline.com