Holiday Dangers
Poisonous to Pets

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VPI® and 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
  - VPI covers the $39 Pet Poison Helpline fee when a pet is brought in to your hospital for care

- Enabling best medicine
  - Pet owners with VPI Pet Insurance spend twice as much on their pets (single events) than those without VPI Pet Insurance
VPI® and Pet Poison Helpline® working together

- Providing veterinary reviewed pet health information online
  - [www.petpoisonhelpline.com/owners](http://www.petpoisonhelpline.com/owners)
  - [www.petinsurance.com/healthzone.aspx](http://www.petinsurance.com/healthzone.aspx)

- Providing complimentary pet owner educational materials for your practice – available for ordering
  - First Aid for Your Pet brochure
  - Poisoning Emergencies brochure
  - Toxins in the Kitchen stickers
  - Toxic Human Meds stickers
  - Emergency Numbers stickers
Introduction

Ahna G. Brutlag, DVM, MS, DABT, DABVT

Associate Director

Pet Poison Helpline
Minneapolis, Minnesota
Pet Poison Helpline

• Animal poison control
  – 24/7 availability
  – $39 one-time fee/case
  – Unlimited case follow-up
  – Access to multiple specialists (DVM and others)
    • Board-certified veterinary toxicologists (DABVT, DABT, Board-eligible ABVT & ABT)
    • Emergency/Critical Care (2 DACVECCs, ECC resident)
    • Internal Medicine (DACVIM)
    • Herpetology
    • PharmDs/clinical pharmacologists
Common Holiday Toxins

• Seasonal Plants
  • Poinsettia
  • Holly
  • Mistletoe
  • Lilies
  • Yew

• Festive Foods
  • Chocolate
  • Nut mixes
  • Alcohol (drinks, desserts, etc.)

• Holiday décor & miscellaneous
  • Chafing fuel
  • Liquid potpourri
  • Tinsel
  • Smokeless logs
Common Holiday Plants
Poinsettia

- Poinsettia (*Euphorbia pulcherrima*)
  - Overrated toxicity!
  - Diterpenoid euphorbol esters and steroids with saponin-like properties (detergent-like)
  - Milky white sap = contact irritation, pruritus, hypersalivation, vomiting
  - Self-limiting exposures

*White sap on cut surface*
Mistletoe & Christmas Cactus

• Mistletoe (*Phoradendrom* spp.)
  – Overrated!
  – European more toxic than American Christmas mistletoe
  – Clinical signs: GI upset
    • Rarely, depression, hypotension, ataxia, seizures, cardiac disturbances

• Christmas cactus (*Schlumbergera truncata*)
  – Overrated!
  – Humans: urticaria, rhinoconjunctivitis
  – Pets: GI irritation, vomiting, diarrhea, depression, anorexia
Holly & Amaryllis

• English holly (*Ilex aquifolium*)
  – Overrated!
  – Mechanical injury, GI obstruction
  – Saponins, methylxanthines, cyanogens
  – Hypersalivation, GI, head shaking, lip smacking, mild to moderate GI distress

• Amaryllis (*Hippeastrum*)
  – Contain alkaloids (lycorine and tazetine)
  – Concentrated in bulb and leaves (up to 0.5%)
  – Vomiting, diarrhea (+/- blood), anorexia, hypersalivation
    • Rarely: restlessness, tremors, dyspnea, hypotension, seizures
Yew (*Taxus spp.*)

- **Japanese Yew (*Taxus cuspidate*)**
  - Very dangerous cardiotoxin! “Tree of Death”
  - Common evergreen shrub; most toxic in winter; dried plant retains toxin
  - Toxin: Taxines A & B
    - Directly block myocardial Ca and Na channels
    - Negative inotrope (weaker contraction), AV conduction delay
  - Canine minimum lethal dose = 2.3 grams leaves/kg
  - Equine and livestock risk if wreath hung in stable/discarded in pasture
  - Toxic doses:
    - 0.1% body weight in horse
    - 0.5% body weight in ruminant

Japanese Yew

All parts toxic (including seed) except flesh of the aril (fruit).
Wreath with yew and holly

http://woodsmancrafts.blogspot.com/2012_12_01_archive.html
Treatment for Yew poisoning

• Emesis and charcoal (one dose)
• Cardio care
  – Bradycardia: Atropine 0.02 – 0.04 mg/kg IV or IM
  – Continuous ECG monitoring
  – Blood pressure monitoring
  – Tachycardia with VPCs: lidocaine
  – IV crystalloids at 1.5-2X maintenance
• Supportive
  – Anti-emetics, anticonvulsants, oxygen
Toxic lilies

- True lilies
  - *Lilium* and *Hemerocallis* species
  - Easter lily, Tiger lily, Day lily, Stargazer lily, all Asiatic lilies
  - Common sound-alikes

- Cats only

- Toxic dose
  - 1-2 leaves or petals

- Toxic portion
  - All of the plant, even pollen!

Day Lily (*Hemerocallis spp.*)
Lilium sp. Examples (true lilies)

- Easter Lily
  *Lilium longiflorum*
- Tiger Lily
  *Lilium tigrinum*
- Asiatic Lily
Tiger Lily (Lilium sp.)
Very common in cut-flower bouquets

(*Lilium* spp.)
Not all lilies are true lilies!

- These plants are NOT true lilies (*Lilium* sp.)
- Do NOT cause renal failure in cats but do have other toxic principles

Calla Lily (*Zantedeschia* species)

Peace Lily (*Spathiphyllum* genus)

Lily of the Valley (*Convallaria majalis*)
Peruvian lily (*Alstroemeria* spp.)

Non-toxic!
Lily Toxicosis

• Clinical Signs (CS)
  – 0-3 hours post-ingestion
    • Vomiting, anorexia, depression
  – 12-24 hours post-ingestion
    • Beginning of renal failure
    • Crystals do NOT form
  – 1-5 days post-ingestion
    • Dehydration develops
    • Stop producing urine
    • Death due to acute renal failure

• Prognosis
  – Good if early and treated aggressively
  – Grave if no treatment
  – Poor if IVF not started within 18 hr or anuria has developed
Treatment

• Aggressive decontamination
  – Emesis induction
    • Xylazine 0.44 mg/kg IM once
  – Activated charcoal + cathartic 1X

• Fluids, fluids, fluids X 48-72 hours

• Gastrointestinal support:
  – Antiemetic
  – H₂ blocker
  – Phosphate binders
  – Nutritional support
Treatment

• Appropriate monitoring
  • Blood pressure
  • Urine output
    – Normal: 1-2 ml/kg/hour
    – Measuring ins and outs

• Monitoring baseline blood work
  – Recheck PCV/TS, renal panel q 24 X 2-3 days; repeat in 3-5 days

• Peritoneal or hemodialysis
Holiday Foods
Holiday foods

- Chocolate
  - 50% of PPH’s food calls
  - See Top 10 Toxin Webinar, Oct 2013 (RACE credit!)
- Macadamia nuts*
- Alcohol*
- Table salt*
- Grapes/raisins/currants
- Xylitol (sugar free foods)
- Caffeine (coffee, tea, energy drinks)
Macadamia nuts

- *Macadamia integrifolia* and *Macadamia tetraphylla*

- Madagascar, Australia, Hawaii, California

- Macadamia nuts contain up to 80% oil and 4% sugar.
Macadamia nuts

- **Toxic dose:** > 2 grams/kg
  - 1 nut = 2-3 grams

- The toxic mechanism is unknown but the proposed effect may involve motor neurons, neuromuscular junctions, muscle fibers or neurotransmitters.

- **Clinical signs:**
  - 3-6 hours: Lethargy, vomiting, and hyperthermia
  - 6-12 hours: Hind limb weakness, ataxia, tremors, recumbency
  - May also see signs of abdominal pain, lameness, joint stiffness, pale mucus membranes.
Macadamia nuts

• Time to onset of symptoms: <12 hours
• Duration of symptoms: Generally < 48 hours

• Treatment:
  – Supportive! No antidote.
  – Monitor temperature, hydration
  – Risk for pancreatitis
    • ↑ lipase, WBC
Alcohol (ethanol)

• Atypical sources:
  – Unbaked yeast bread dough
  – Rum or brandy soaked desserts
  – Fermenting garbage/fruits
    • Dog death from rotten apples
  – Household items
    • Hand sanitizers
    • Chafing fuel
    • Cleaners
Alcohol (ethanol)

• Rapidly absorbed!

• Clinical signs:
  – Lethargy
  – Ataxia/weakness
  – Hyper- or hypo-thermia
  – Hypoglycemia
  – Hypotension
  – Seizures (r/o hypoglycemia)
  – Respiratory failure

• Ingestion of dough: GI obstruction, bloat, GDV
  – Vomiting, diarrhea, non-productive retching, alcohol odor
Alcohol (ethanol)

• Treatment:
  – Supportive
  – Temperature and blood glucose regulation
  – IV fluids + dextrose CRI
  – Neurologic and respiratory support
  – Treatment for bloat/GDV
    • Emesis induction?
    • Cold water gastric lavage vs. surgery
Chafing fuels

• What’s in them?
  – Methanol (Sterno “Canned Heat”)
  – Ethanol
  – Diethylene glycol (DEG)
Methanol/DEG

- Methanol
  - LD50 in dogs: 5-11 mL/kg
  - Similar to ethanol intoxication in cats/dogs
  - CNS depression is primary sign
  - Methanol does not cause acute kidney failure!
  - Blindness in primates only
  - If no clinical signs in 3-4 hrs, unlikely to have been poisoned
  - No need for fomepizole (4MP)

- Diethylene glycol (DEG)
  - LD50 in dogs and cats: 3-11 mL/kg
  - Rapid onset CNS depression, +/- vomiting
  - Apparent recovery, anuric renal failure a few days later
    - No oxalate nephrosis (as with ethylene glycol)
  - Fomepizole (4MP) may be helpful
CASE REPORT
Case of the holiday Dane

• 5 mo intact male great Dane, 21 kgs (47 lbs)

• History: “Got into garbage”
  – 3 hr after, PU/PD and anorectic at home
  – No rDVM PE available

• Initial labs (8-10 h post garbage ingestion)
  – NA >180mmol/L (141-159)
  – Cl 121mmol/L (100-118)
  – K 4.6mmol/L (3.4-5.6)
  – PCV 41% (33.6-58.7)
  – TPP 6.8g/dL (5.0-8.3)
Case of the holiday Dane

What was in the garbage?!
Homemade Christmas Ornaments

1 Cup Flour
½ Cup Salt
½ Cup Water
Case of the holiday Dane

• Initial treatment @ rDVM:
  – NormR at 2.5 x maintenance 10-12 hrs, transfer to ER
  – No additional data

• Presents to ER 24 hrs post exposure with:
  • PU/PD
  • Anorexia
  • Vomiting
  • Head Pressing
  • Circling
  • Ataxia
  • Obtunded
  • Well hydrated
Sad case of the holiday Dane

• ER calls Pet Poison Helpline
• PPH treatment recommendations
  – Calculate free water deficit
    • \([0.6 \times \text{BW in kgs}] \times \left[\left(\frac{\text{current Na}}{\text{desired Na}}\right) - 1\right] = \text{L of water}\)
    • This dog = 2 L
  – Start D5W to correct deficit!
  – Bolus with NormR if dehydrated
  – Furosemide: 2.2mg/kg x 1 dose only
  – Metoclopramide/Cerenia as an antiemetic
  – Diazepam for agitation
  – Repeat electrolytes in 2-3 hours
  – No mannitol yet

• Do not correct faster Na\(^{+}\) than 0.5-1 mEq/L/hr (!?)
Sad case of the holiday Dane

- 32 hours post exposure
  - PE:
    - More obtunded
    - Circling to the left
    - Paddling
    - Tremoring
    - Pupils are not responsive with strabismus (looking in different directions)
  - Labs
    - PCV up to 56% (from 41%)
    - TP up to 7g/dL (from 6.8)
    - Na still >180 mmol/L (141-159)
    - Cl up to 141 mmol/L (from 121)
Sad case of the holiday Dane

• 32 hours post exposure
  – Treatment per PPH DACVECC
    • Stop all furosemide or mannitol!
    • Bolus a crystalloid over 20-30 minutes for a few hours at 20 ml/kg IV. Use Normosol to rehydrate.
    • Change to D5W within 2-3 hours at the latest. Increase the D5W to 7 ml/kg/hr.
    • NG tube for trickle water at 60 ml over 30-60 minutes if tolerating and repeat as possible
    • Radiographs to determine if the ornaments are still in the GIT, leaching.
Sad case of the holiday Dane

• Radiographs
  – Confirmed large amount of material present in GIT
  – Ornaments?
  – Suspect continued NaCl absorption

• Patient condition poor for surgical intervention

• Na remains >180 mmol/L
Sad case of the holiday Dane

• **New history:** Ingestion may have been **5 days ago.**

• Does this change anything?

Sad ending… 48 hours post exposure
  – Owner elects euthanasia
Sodium Intoxication

- **Common “non-food” sources:**
  - Homemade play dough
  - Baking soda (sodium bicarbonate)
  - Paintballs
  - Sea water

- **Iatrogenic intoxication**
  - Salt emetics (bad idea!)
  - Sodium phosphate enemas
  - Hypertonic saline
  - Activated charcoal

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**Homemade Play Dough/Decoration Ingredients**

- 1 cup salt
- 1 cup water
- 1/2 cup flour plus additional flour

Sodium—Toxicity

• How much sodium is in this?
  – 1 Tablespoon table salt = 17.85 grams
  – 1 cup table salt = 285.6 grams
  – Homemade play dough = 8 grams/tablespoon
  – 1 Tablespoon baking soda = ~1 gram sodium

• Toxic doses (dogs):
  – Serum Na >170 mEq/L
  – 2-3 g/kg table salt = clinical signs
  – 4 g/kg table salt = lethal
  – 1.9 g/kg homemade play dough
  – 2-4 tsp/kg baking soda
Hypernatremia — Clinical Signs

• In the first 3 hours...
  – Vomiting
  – Diarrhea
  – Anorexia

• Followed by...
  – Ataxia
  – Tremors
  – Seizures
  – Coma

Direct GI irritant effects

Due to fluid shift into CNS
  • Cell shrinkage/dehydration
  • Hyperosmolality
  • Hemorrhage
Treatment for **acute** hypernatremia

- **Decontamination?**
  - Emesis (?) or lavage
  - No charcoal!

- **Calculate water deficit**
  - \[0.6 \times \text{BW in kgs} \times [(\text{current Na/desired Na}) - 1] = \text{L water}\]

- **Correct deficit** (*use caution!*)
  - Hydrate first! Match serum Na to fluid Na concentration.
  - If acute: drop sodium level acutely!
  - Give up to \(\frac{1}{2}\) deficit over 1-2 hrs, remainder over 4-6 hrs
  - OK to correct faster Na\(^+\) than 0.5-1 mEq/L/hr (acute only)

- **When in doubt**
  - 3.7 mL/kg/hr of D5W lowers Na by 1 mEq/L/hr
Treatment for acute hypernatremia

• Other
  – Anti-emetics
  – Anticonvulsants (e.g., diazepam, phenobarbital, propofol)
  – Treat for cerebral edema

• MUST CHECK sodium levels q 2-3 hrs!

• Goal: Treat until signs resolve
Treatment for cerebral edema

• Occurs when serum Na dropped too fast

• Stop or slow D5W!

• Then...
  – Head elevation at 15-30°
  – Minimize jugular restraint
  – Mannitol 0.5-2 g/kg IV over 20-30 minutes to effect?
  – Furosemide 2.2-4.4 mg/kg IV to effect?
Good reads...

**Successful treatment of severe salt intoxication in a dog**

Céline Pouzot, DVM, Christelle Descone-Junot, DVM, Julien Loup, DVM and Isabelle Goy-Thollot, DVM

**Hypernatremia secondary to homemade play dough ingestion in dogs: a review of 14 cases from 1998 to 2001**

Julie M. Barr, BS, Safdar A. Khan, DVM, MS, PhD, DABVT, Sheila M. McCullough, DVM, MS, DACVIM and Petra A. Volmer, DVM, MS, DABVT, DABT
Holiday décor!
Liquid potpourri

• Species of concern: **Cats**

• **Products contain**
  – Cationic detergents
  – Essential oils
  – May not be listed on label!

• **Clinical signs from essential oils**
  – Oral and GI irritation & ulceration (4-6 hrs)
  – CNS depression
  – Dyspnea/ARDS
  – Hyperthermia
  – Possible hepatotoxicity
Liquid potpourri

• **Treatment:**
  – Do NOT induce emesis!
  – No activated charcoal!
  – Bathe well with degreasing soap
  – IV or SQ fluids
  – Pain control (e.g., buprenorphine)
  – Sucralfate slurry (250 mg PO TID X 5 days)
  – Chest radiographs
  – Antibiotic therapy
  – Supportive measures as needed
Tinsel/Ribbon

• Cats = linear foreign body
• Thorough oral exam + PE
• Sedate if needed!
• Don’t cut the linear foreign body!
Smokeless logs

• Made of compressed sawdust
• Low toxicity
• Higher risk of bowel obstruction
• Rare: heavy metals (colored flames!)
Silica gel packets
- Found in new shoe boxes, purses, pill bottles, etc.
- Risk of obstruction if *packet* ingested
- Non-toxic

Not the same as **oxygen absorbers**!
- Found in food packaging
- Contain iron = possible iron poisoning
  - Black or brown powder
  - Magnetic
Batteries

• They’re under every tree...

• Biggest concern is for corrosive injury

• Watch our “Top 10 Toxins” webinar from October, 2013 to learn more!
  – 1 hr of RACE approved CE
When in doubt, call for the bad ones

- Something you’re not familiar or comfortable with
- Human drugs
- Corrosive products
- Mixed drug ingestions
- Severe clinical signs
- Animals with preexisting disease
Stocking stuffers!

Our iPhone app
Details 200+ toxins
$1.99

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Request one via email
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Thank you for attending!

**CE credit FAQs**

1. **When will I get my CE certificate?** We’ll email it to you within 24 hrs.

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 1 pm central time, Dec 4, 2013 (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
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PLANTS POISONOUS TO SMALL ANIMALS
Date: April 1, 2014

RODENTICIDES... IT’S MORE THAN JUST VITAMIN K!
Date: June 10, 2014

FOODS TOXIC TO PETS
Date: October 7, 2014

TEACHING MOMENTS IN TOXICOLOGY
Date: December 2, 2014

All webinars will be given at and presented by:

Time: 12:00-1:00pm Central Time (1:00-2:00pm Eastern)

Speaker: Ahna Brutlag, DVM, MS, DABT, DABVT

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Course meets the requirements for 1 hour of continuing education credit per lecture in jurisdictions which recognize AAVSB RACE approval; however, participants should be aware that some boards have limitations on the number of hours accepted in certain categories and/or restrictions on certain methods of delivery of continuing education.
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