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

PET POISON HELPLINE

Holiday Dangers

Poisonous to Pets

December 3, 2013

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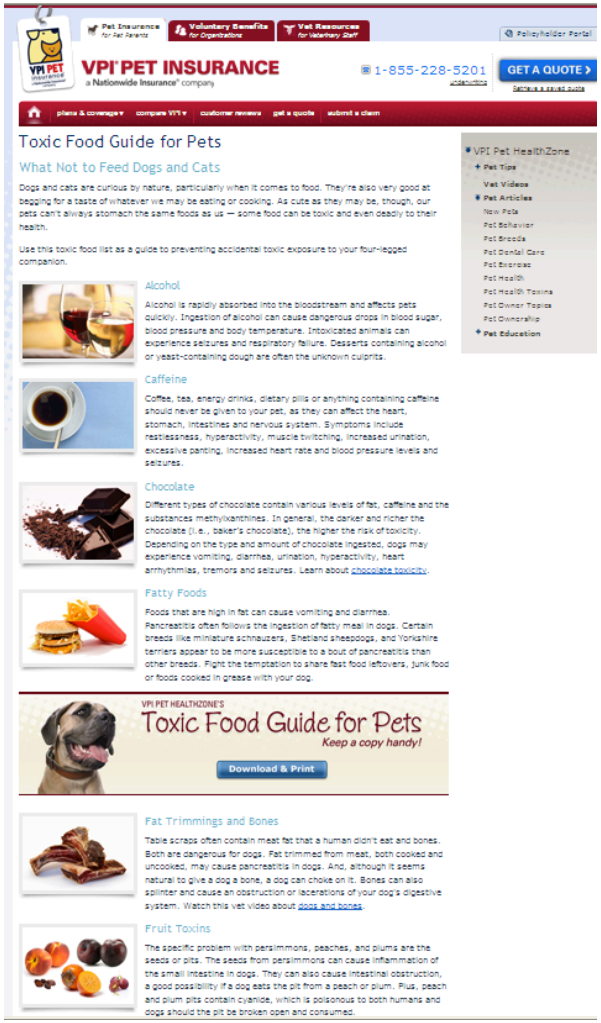
VPI® and Pet Poison Helpline® working together

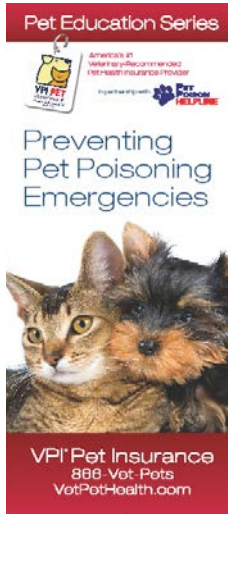
- Shared mission in highlighting the importance of preparing for accidents and poisonings in small animals
- Addressing the cost of veterinary care
  - VPI covers the $39 Pet Poison Helpline fee when a pet is brought in to your hospital for care
- Enabling best medicine
  - Pet owners with VPI Pet Insurance 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
  - 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





PET POISON HELPLINE

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

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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

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

- Cope RB, et al. Fatal yew (Taxus sp) poisoning in Willamette Valley, Oregon, horses. *Vet Hum Toxicol*. 2004 Oct;46(5):279-81.
- Wilson CR, Sauer J, Hooser SB. Taxines: a review of the mechanism and toxicity of yew (*Taxus spp.*) alkaloids. *Toxicon* 2001;39:175-185.

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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.)*

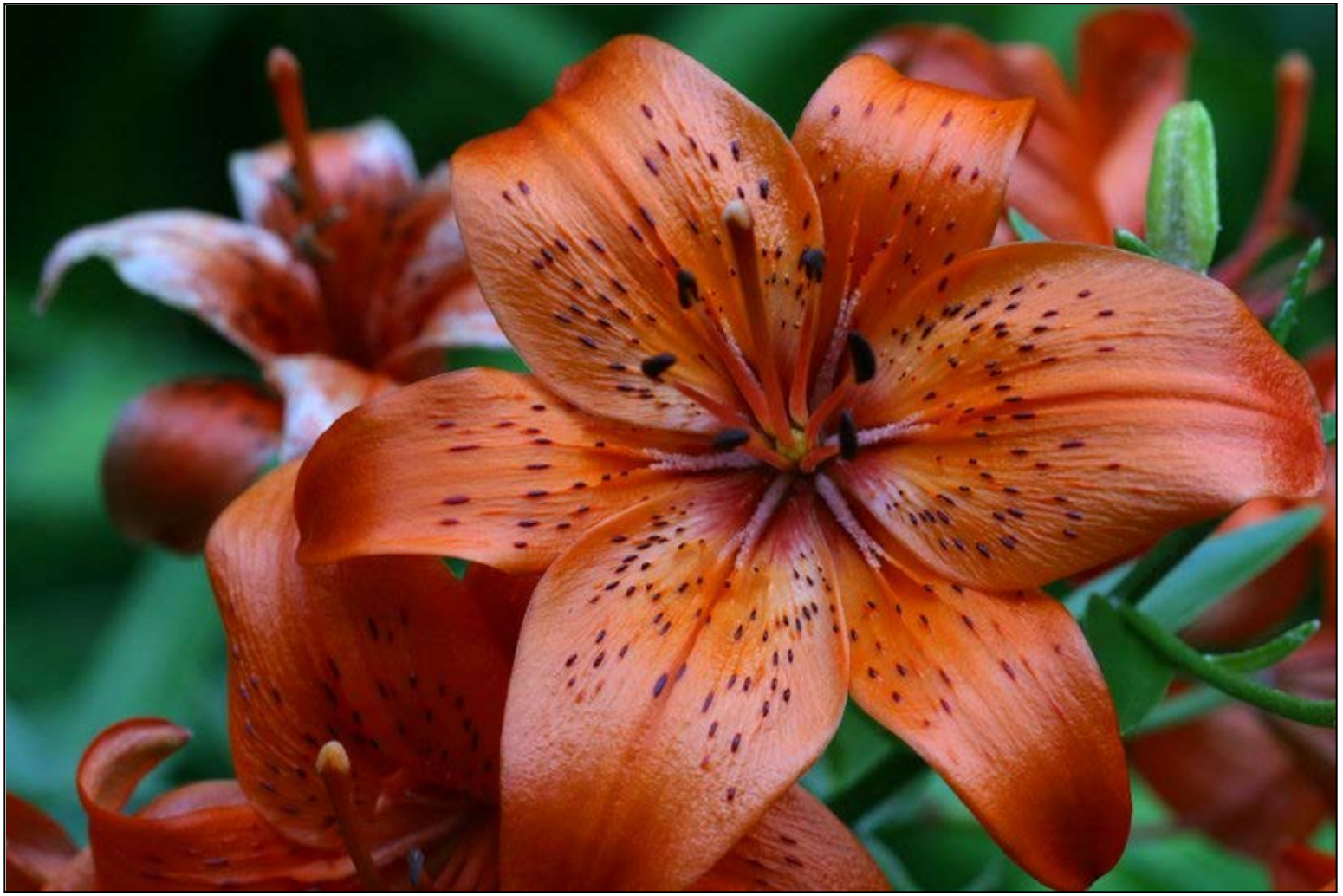
Lilium sp. Examples (true lilies)

Easter Lily
Lilium longiflorum

Tiger Lily
Lilium tigrinum

Asiatic Lily

Tiger Lily (*Lilium* sp.)



Very common in cut-flower bouquets (*Lilium* spp.)

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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
  - H_2 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.

- <u>Clinical signs:</u>
  - 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?!

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Homemade Christmas Ornaments

1 Cup Flour

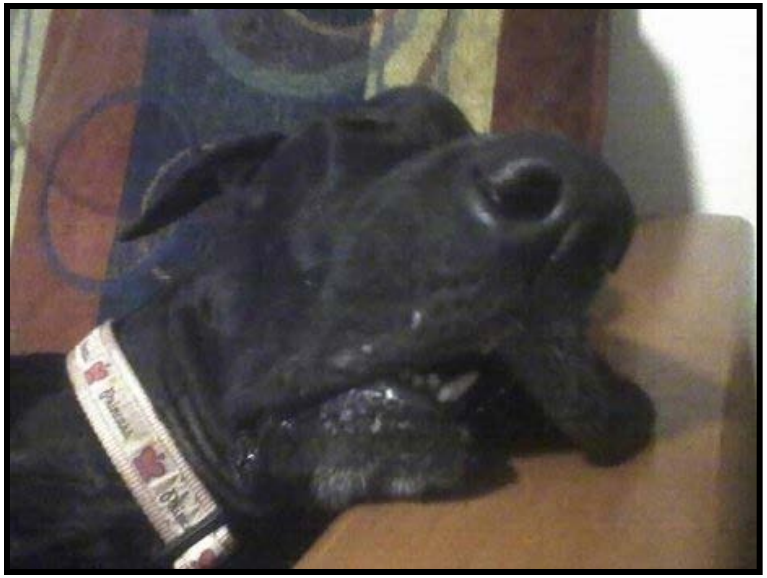
½ Cup Salt

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 x BW in kgs] x [(current Na/desired Na) – 1] = 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 141mmol/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

bukiandoscar.com

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

Homemade Play Dough/Decoration Ingredients

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

http://fun.familyeducation.com/sculpting/recipes/37040.html#ixzz2BHhQiukn

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

Direct GI irritant effects

- Followed by…
  - Ataxia
  - Tremors
  - Seizures
  - Coma

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 x BW in kgs] x [(current Na/desired Na) – 1] = L water
- Correct deficit (*use caution!*)
  - Hydrate first! Match serum Na to fluid Na concentration.
  - If acute: drop sodium level acutely!
  - Give up to ½ 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^{o}
  - 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…

Case Report

Journal of Veterinary Emergency and Critical Care 17(3) 2007, pp 294–298
doi: 10.1111/j1476-4431.2007.00230.x

Successful treatment of severe salt intoxication in a dog

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

Case Report

Journal of Veterinary Emergency and Critical Care 14(3) 2004, pp 196–202

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!

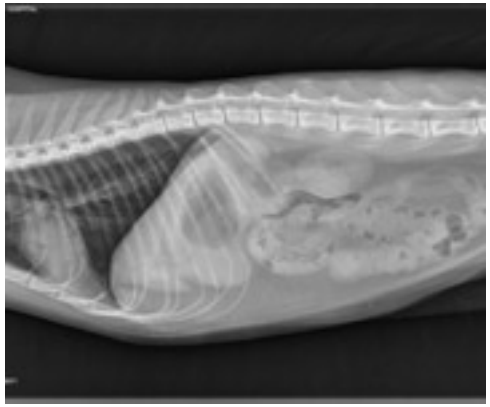
- Clinical signs from essential oils
  - Oral and GI irritation & ulceration (4-6 hrs)
  - CNS depression
  - Dyspnea/ARDs
  - Hyperthermia
  - Possible hepatotoxicity

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: Deadly or not?

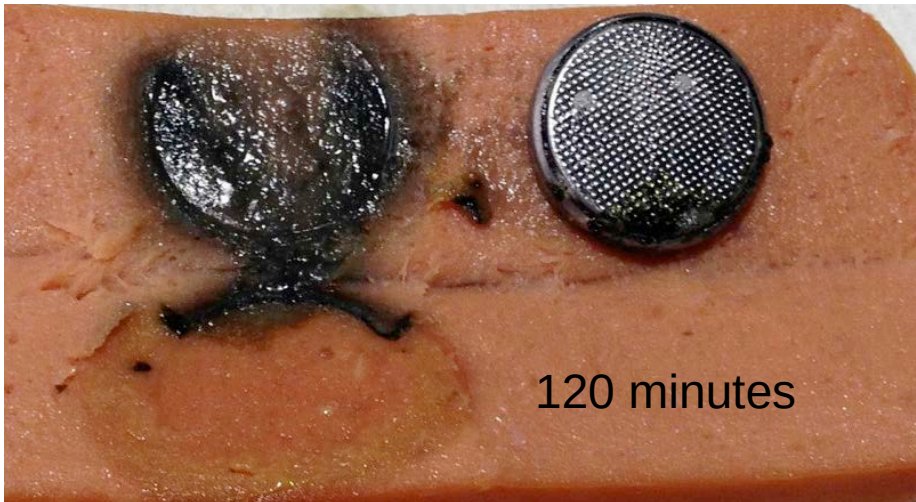
- **Silica gel packets**
  - Found in new shoe boxes, purses, pill bottles, etc.
  - Risk of obstruction if *packet* ingested
  - Non-toxic

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

http://en.wikipedia.org/wiki/File:Oxygen_Absorber.J

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

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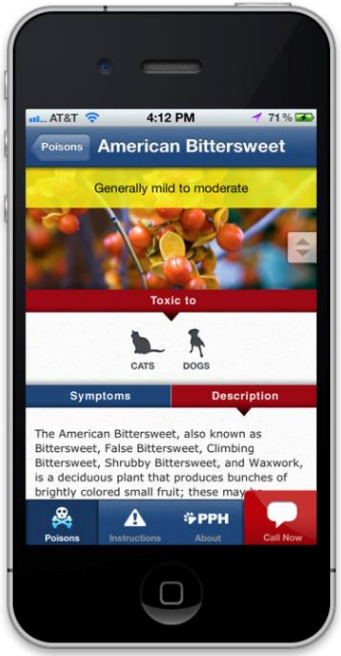

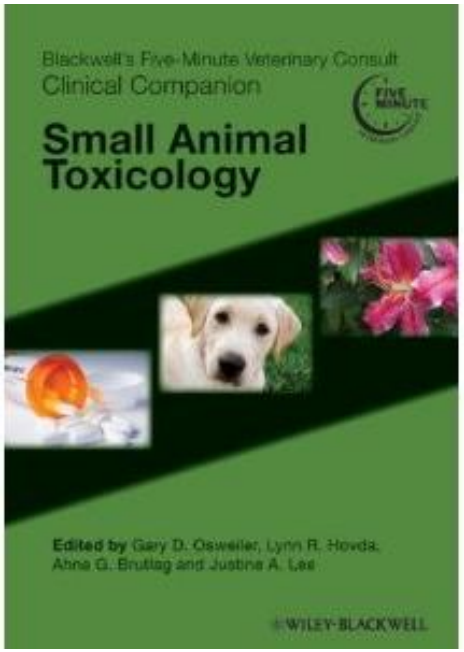

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