

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

PET POISON **HELPLINE**



Top 10 Toxins Poisonous To Small Animals

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Did you know?

- The incidence rate of our top three toxicities in small animals
- In 2012 VPI Pet Insurance received

Toxicity/overdose of
OTC and prescription
meds (incl flea/tick)

of Pets =
1,168

Avg. Cost per
Pet = \$581

Methylxanthine toxicity
(chocolate, caffeine)

of Pets =
966

Avg. Cost per
Pet = \$380

Poisoning of plant
origin (nuts, grapes,
onions, tobacco,
mushrooms)

of Pets =
750

Avg. Cost per
Pet = \$507



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

Introduction



Ahna G. Brutlag, DVM,
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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



Selected Top 10 Toxins

See full section at www.petpoisonhelpline.com

- Chocolate
- SSRI antidepressants
- ADD/ADHD meds
- Sleep aids
- NSAIDS
- Insect bait stations
- Silica gel packs/Oxygen absorber sachets
- Batteries
- Household cleaners





Chocolate



Chocolate

- Contain naturally occurring methylated xanthine alkaloids (methylxanthines)
 - Theobromine
 - Caffeine
- Found in cacao beans, the seeds of the *Theobroma cacao* plant



Chocolate

- Stays in the stomach for a long time!
 - Slow absorption (up to 12 hours)
- Delayed emesis = OK
- Spontaneous vomiting often occurs with large ingestions.
- Long $T_{1/2}$: 17 hours (theobromine)
- May need to treat/observe for 72-96 hours



Chocolate

- Methylxanthines (theobromine and caffeine) = toxic component:

Product	Theobromine	Caffeine
White chocolate	0.25 mg/oz	0.85 mg/oz
Milk chocolate	44-60 mg/oz	6 mg/oz
Dark semisweet	135 mg/oz	20 mg/oz
Unsweetened baker's chocolate	390-450 mg/oz	47 mg/oz
Dry cocoa powder	400-737 mg/oz	70 mg/oz
Cocoa beans	300-1500 mg/oz	
Cocoa bean mulch	56-900 mg/oz	

Chocolate

- When do you see signs? (theobromine)
 - Mild signs (agitation, GI): 20 mg/kg
 - Moderate signs (cardiotoxicity): 40-50 mg/kg
 - Severe signs (neurotoxicity): 60 mg/kg

- Clinical signs:
 - *Chocolate vomiting*
 - *Chocolate diarrhea*
 - Polyuria
 - Agitation/hyperactivity
 - Hyperthermia
 - Cardiac arrhythmias (tachycardia, VPCs)
 - Tremors
 - Seizures



Chocolate: Treatment

- Supportive
- IV fluids + frequent walks to keep bladder empty
- Temperature monitoring
- Anti-emetics/pro-kinetics
 - Maropitant: 1 mg/kg SQ q. 24
 - Metoclopramide: 0.1-0.4 mg/kg q. 6 SC, IM or 1-2 mg/kg/day as CRI IV
 - Ondansetron/dolasetron



Chocolate: Treatment

- ECG monitoring
- If agitated, tachycardic → sedation:
 - Acepromazine: 0.05 mg/kg IV PRN
 - Torbugesic: 0.1-0.4 mg/kg IV PRN
- Beta-blocker therapy
 - Esmolol: 0.25-0.5 mg/kg IV bolus, followed by CRI of 10-200 mcg/kg/min
- Anti-convulsant therapy
 - Diazepam: 0.25-0.5 mg/kg IV PRN
 - Phenobarbital: 4-16 mg/kg IV PRN



Antidepressants and Anxiolytic Drugs



The PURSUIT OF HAPPINESS



Mandy
Morlette
mandymorlette.com
©MandyMorlette 2007

Serotonin Reuptake Inhibitors (SSRI)

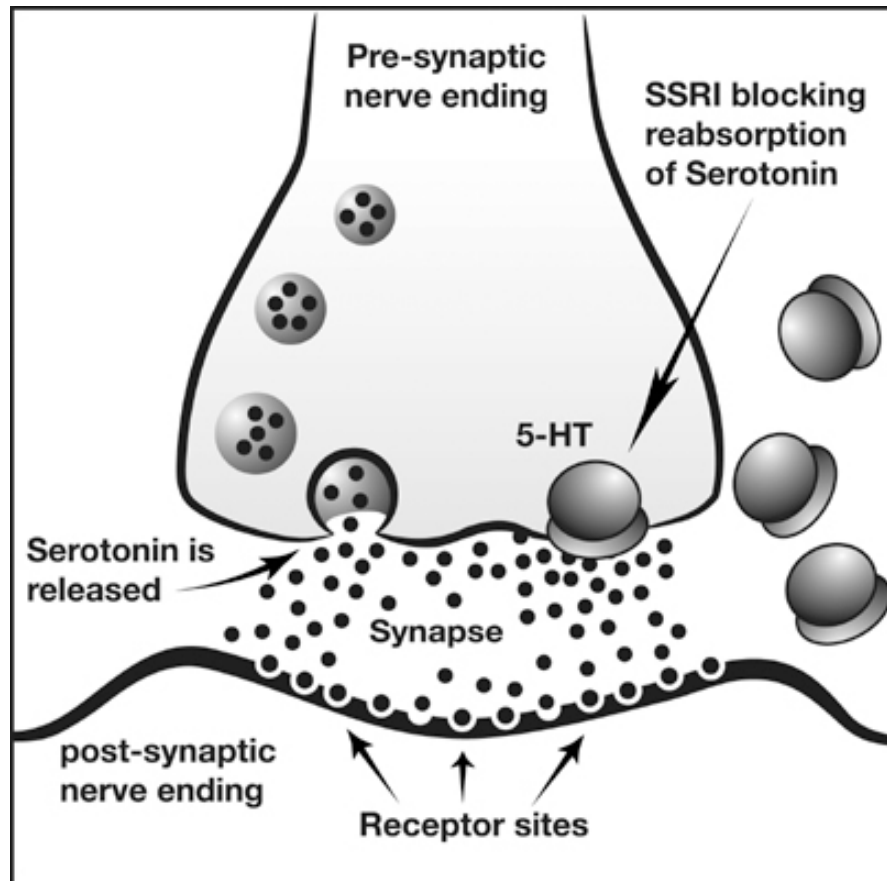
- Common Examples:

- Fluoxetine (Prozac, Reconcile)
- Paroxetine (Paxil)
- Sertraline (Zoloft)
- Trazadone (Trazolan, Desyrel)
- Venlafaxine (Effexor)
- Bupropion (Wellbutrin, Zyban): Not a true SSRI, but overdose can result in serotonin syndrome in dogs and cats.



SSRIs: Mechanism of action

- **MOA:** This group of drugs works by *inhibiting* the re-uptake of serotonin at the presynaptic membrane = **more serotonin at synapse**
 - As ↑serotonin, some animals develop serotonin syndrome



SSRIs: Toxicity



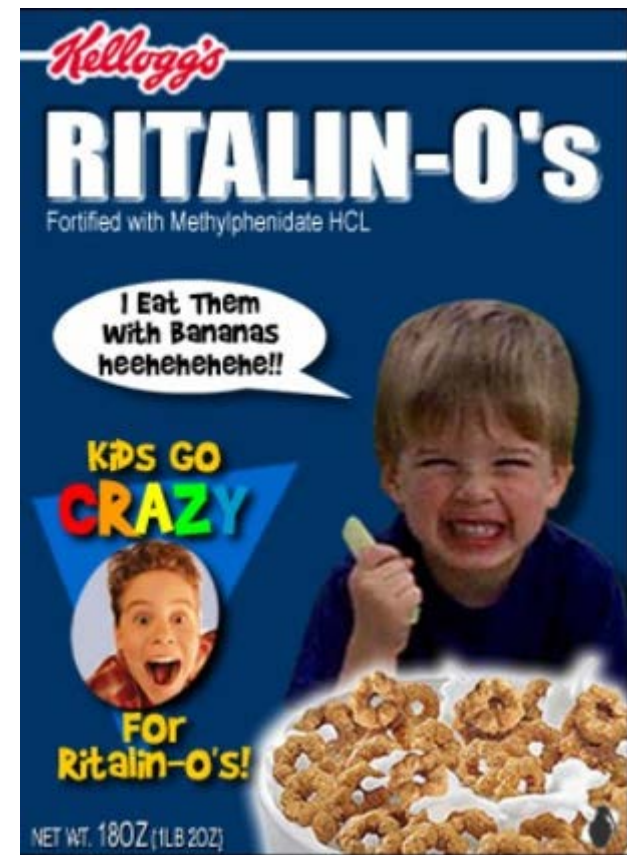
- **Range of toxicity**
 - Different for each medication
 - At 2-3X overdose, clinical signs more possible
 - As the dose of SSRI increases, the risk of serotonin syndrome increases
- **Caution!**
 - Many are rapidly absorbed and have a rapid onset of action
 - Many come in an extended release version (SR or XR)

SSRIs: Clinical signs

- Low doses: mild to moderate sedation
 - CNS: agitation, restless, vocalizing, tremors, seizures
 - GI: hypersalivation, vomiting, diarrhea
 - Cardiovascular: tachycardia, hypertensive
 - Respiratory: panting, hyperventilating
 - Other: hyperthermia
- High doses: more severe or serotonin syndrome
- Treatment: similar to ADD meds



ADD/ADHD Drugs



<http://encefalus.com/wp-content/uploads/2008/08/ritalin.jpg>



ADD/ADHD Drugs

- Common examples:
 - Dextro**amphetamine** /Amphetamine (Adderall)
 - D-**amphetamine** (Dexedrine)
 - Lisdex**amfetamine** (Vyvanse)—new!
 - Meth**amphetamine** (Dexoxyn)
 - Methylphenidate (Ritalin/Concerta)

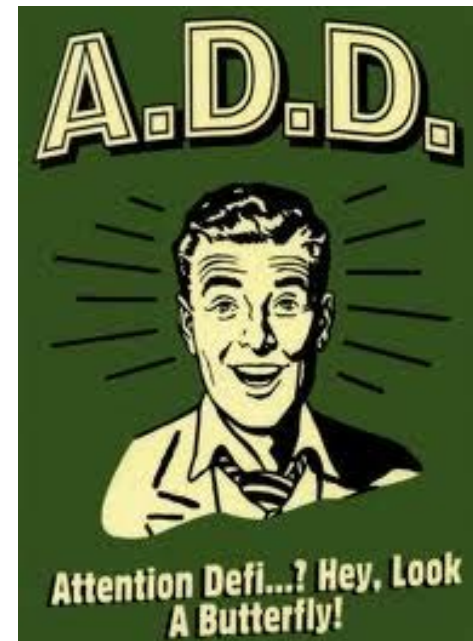


- Similar to methamphetamine
 - Crystal meth



ADD/ADHD Drugs: What are they used for?

- ADD/ADHD
- Obesity (weight loss)
- Narcolepsy
- Illegal/illicit purposes



ADD/ADHD Drugs: MOA

- Amphetamines are *sympathomimetic* compounds
- More potent and structurally related to norepinephrine
- Stimulate the release of norepinephrine
- Directly stimulate alpha and beta adrenergic receptors



ADD/ADHD Drugs: Range of toxicity

- Methylphenidate (Ritalin): 1 mg/kg can cause agitation
- Amphetamine (50% of Adderall) oral LD₅₀ (dog): 20-27 mg/kg
- Methamphetamine LD₅₀ (dog): 9-11 mg/kg
- One dog fatality from methamphetamine at 3.1 mg/kg



SSRI and amphetamines: Clinical Signs

- **CNS:**

- Mydriasis
- Agitation
- Hyperactivity/over-stimulated
- Head bobbing
- Tremors
- Seizures
- Coma
- Flicking ears/tail



SSRI and amphetamines: Clinical Signs

- **Cardiovascular:**

- Tachycardia
- Hypertension

- **Respiratory:**

- Hyperventilating

- **Hyperthermia**



So how do I treat SSRI and ADD intoxications?

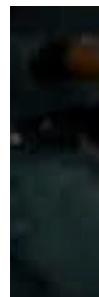
play?

PLAY!!!

IHASAHOTDOG.COM BY



play?



PLAY!!!

Decontamination

- Rapid onset of clinical signs →
 - Emesis best done in the clinic (not by owner!)
 - Emesis only if **asymptomatic**
 - Emesis only if early!
- Activated charcoal with a cathartic (once)
- If “XR” “LA” “SR” multiple doses of activated charcoal
 - No repeated doses of cathartic



Photo courtesy of Garret Pachtinger, VMD, DACVECC

Treatment

- **Monitoring:**
 - Monitor ECG and blood pressure
 - TPR

- **Clinicopathologic testing:**
 - Chemistry
 - Monitor renal function
 - Urinalysis
 - Pigmenturia



Treatment

- **IV fluid therapy:**
 - Cooling measure
 - Prevent myoglobinuric renal failure
- **Hyperthermia:**
 - IV fluids
 - Stop the agitation/tremoring
 - Cooling to 103.5°F/39.7°C and STOP



Treatment

Agitation:

- Acepromazine
 - 0.05-0.2 mg/kg IV, IM, or SQ, titrated to effect
- Chlorpromazine
 - 0.5 mg/kg IV, IM, or SQ, titrated to effect



Treatment

- **Tachycardia (HR > 170 bpm in dogs):**
 - Blood pressure measurement?
 - If hypotensive → IV fluids
 - If hypertensive/agitated →
 - Sedation (acepromazine)
 - Beta-blocker (propranolol 0.02-0.06 mg/kg IV)
- **Seizures:**
 - Phenobarbital 4-16 mg/kg IV or PO PRN, titrated to effect
 - Diazepam 0.25-0.5 mg/kg IV PRN, titrated to effect
 - Don't use with serotonin syndrome?



Treatment:

- Tremors:

- Methocarbamol 44-220 mg/kg IV or PO q. 6-8

- Serotonin syndrome:

- Cyproheptadine (serotonin antagonist)

- Dogs: 1.1 mg/kg PO or rectal q. 6-8-12 hours

- Cats: 2-4 mg *total* PO or rectal q. 6-8-12 hours



Sleep Aids



Sleep Aids



- Are often benzodiazepines or non-benzodiazepine hypnotics

- **Examples**

- Zolpidem (Ambien)
- Eszopiclone (Lunesta)



- **MOA**

- The non-benzos are similar to benzos as they potentiate GABA transmission, increase frequency of chloride channel opening → resulting in inhibition of neuronal excitation

Sleep Aids

- Range of toxicity
 - Varies widely with the drug
 - Typically have a reasonably wide margin of safety
- Time to onset: ~ 1-2 hrs
- Duration of signs: ~ 12 hrs



Sleep Aids: Clinical signs

- CNS: ataxia, depression, paresis
- But... **40-50%** of dogs → paradoxical CNS stimulation!
Hyperactivity, agitation, panting, tremors
- Other: nausea, vomiting, diarrhea, hyperthermia
- Rare to see excessive respiratory and cardiac depression



Sleep Aids: Treatments

- Decontamination:
 - Early and judicious use of emetics if no CNS effects observed.
 - Activated charcoal + cathartic (A/C/C)



Journal of Veterinary Emergency
and Critical Care



Retrospective Study

Journal of Veterinary Emergency and Critical Care 21(6) 2011, pp 658–665
doi: 10.1111/j.1476-4431.2011.00694.x

Sleep aid toxicosis in dogs: 317 cases (2004–2010)

Adam R. Lancaster, DVM; Justine A. Lee, DVM, DACVECC; Lynn R. Hovda, RPH, DVM, MS, DACVIM; Brian T. Hardy, DVM; Lee X. Miyahara, VMD; Elizabeth P. Martin, VMD and Megan F. Whelan, DVM, DACVECC

Sleep Aids: Treatments

- If paradoxical stimulation → do NOT treat with benzodiazepines!
 - Phenothiazines or barbiturates are preferred
- Antidote:
 - Flumazenil should be used in *only severe cases*- re-dose as needed
 - Re-dose as needed
 - Monitor carefully for seizures



OTC meds: NSAIDs



NSAIDS

- **Common products**

- Ibuprofen: All things Advil or Motrin
- Naproxen: All things Aleve or Anaprox
- Many things “cold and flu”



MOA of NSAIDs

- Competitive inhibitor of prostaglandin synthesis (cyclooxygenase)
→ ↓PGI₂ and PGE₂
- Affected organs:
 - GIT
 - Renal
 - Platelet
 - CNS (high dose)
- Sensitivities:
 - NSAID sensitivity
 - German shepherds
 - Cats



Ibuprofen: Toxic doses (dogs)

- **8 -16 mg/kg:** Acute and chronic → mild gastritis
 - On post-mortem, GI ulcers, erosions, and severe gastrointestinal (GIT) disease present.
- **50 -100 mg/kg:** Mild to severe GI upset
- **> 100- 250 mg/kg:** Renal compromise to renal failure
- **> 300 mg/kg:** Fatalities (treated and untreated animals)



Naproxen: Toxic doses (dogs)

- Potent NSAID
- Long $\frac{1}{2}$ life! 72 hours!
- Clinical signs: ≥ 5 mg/kg
- Study: 22 mg/kg PO X 3 days = duodenal ulcers, perforations, peritonitis



Ibuprofen and Naproxen



- **Ibuprofen range of toxicity for 20 kg dog:**
 - 5 tablets of ibuprofen (Advil, 200 mg tablet) → GI ulcers
 - 15 Advil → acute kidney failure (ARF)
- **Naproxen range of toxicity for 20 kg dog:**
 - ½ tablet of naproxen (Aleve, 200 mg tablet) → GI ulcers
 - 2 tablets of Aleve → duodenal ulcers, perforations, peritonitis



Clinical Signs with NSAIDS

- Pallor
- Prolonged CRT
- Tachycardia
- Tachypnea
- Vomiting
- Melena
 - Rectal, rectal, rectal!

NSAIDs: Treatment

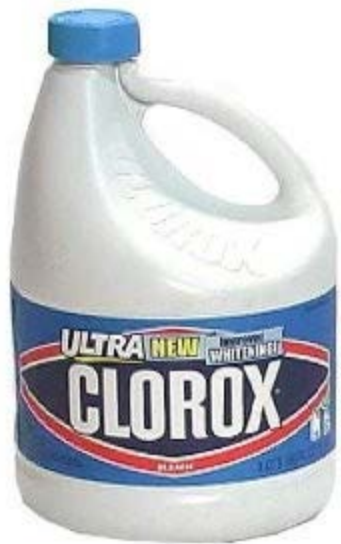
- Decontaminate (emesis, activated charcoal)
 - Time since ingestion?
 - Gel cap vs. chewable?
 - Enterohepatic recirculation?
 - Activated charcoal \pm cathartic
- Baseline blood work
 - PCV/TS, renal panel q. 24 hours X 2-3 days
 - Recheck 3-5 days thereafter
- IV fluids
 - Vasodilate renal vessels \rightarrow prevent ARF
 - 2-3.5X maintenance

NSAIDs: Treatment

- Gastric protectants x 7-10 days
 - Sucralfate
 - H₂ blocker
 - Proton-pump inhibitor
 - +/- Misoprostol

- Monitor CNS – treat seizures with diazepam



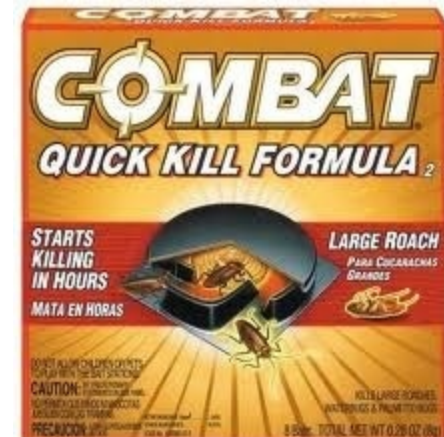


HOUSEHOLD ITEMS



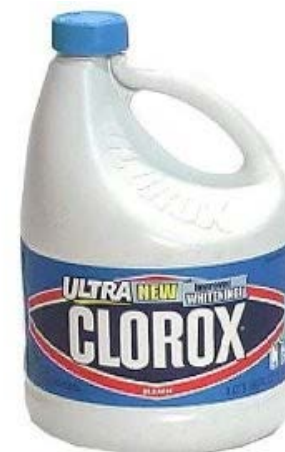
Insect bait stations

- Low concentration abamectin, fipronil, hydramethylnon
- Peanut butter/sugar base
- Rarely toxic
- Plastic **foreign body obstruction** (FBO) risk
- **Treatment:** typically not necessary



Household cleaners

- Most household cleaners are not highly toxic or corrosive—mostly GI irritants
- Worrisome products (possibly corrosive)
 - Ultra bleaches
 - Drain/oven cleaners
 - Automatic dishwasher detergent
- Laundry detergent pods?
 - Aspiration after puncturing



Household batteries—3 common types

- Dry cell
 - Grey/black powder inside
 - Look for evidence on teeth



- Button
 - Size of pencil eraser
 - Rarely a concern if ingested (too small)



Button Alkaline

Battery

- Lithium ion
 - Risk of fatality if ingested!



Lithium Batteries

- Corrosive to GI mucosa due to *electrical discharge* and contents
 - Li batteries → higher voltage, more tissue necrosis than button alkali batteries
- Onset of signs: within 1-12 h
- Diagnostics
 - Physical exam
 - Radiograph
- Treatment:
 - Remove foreign body?
 - Administer GI protectants
 - Re-radiograph



Button Alkaline

Battery



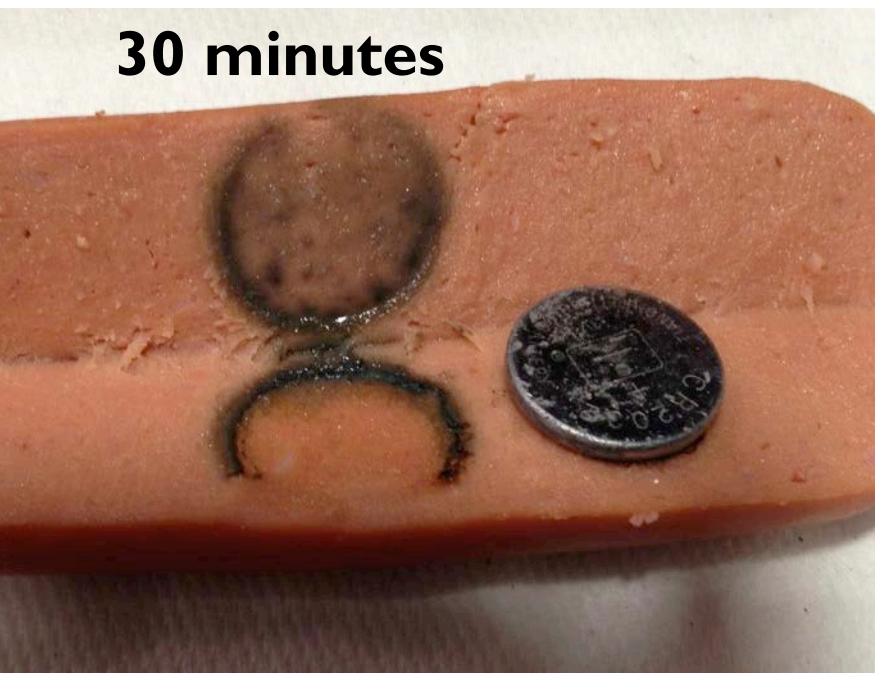


Lithium battery vs. hotdog

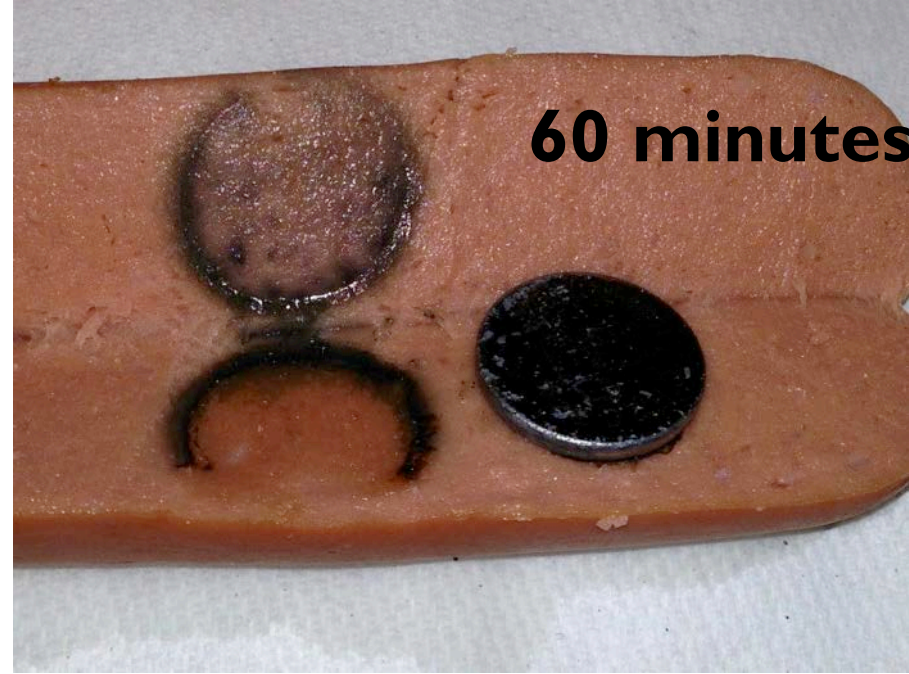
Courtesy of the Arizona Poison & Drug Information Center



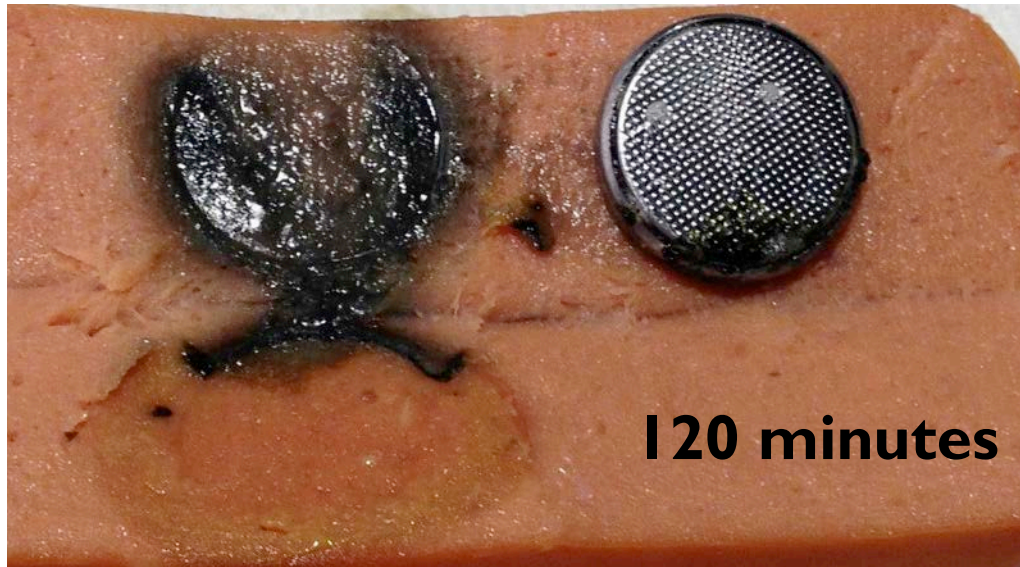
30 minutes

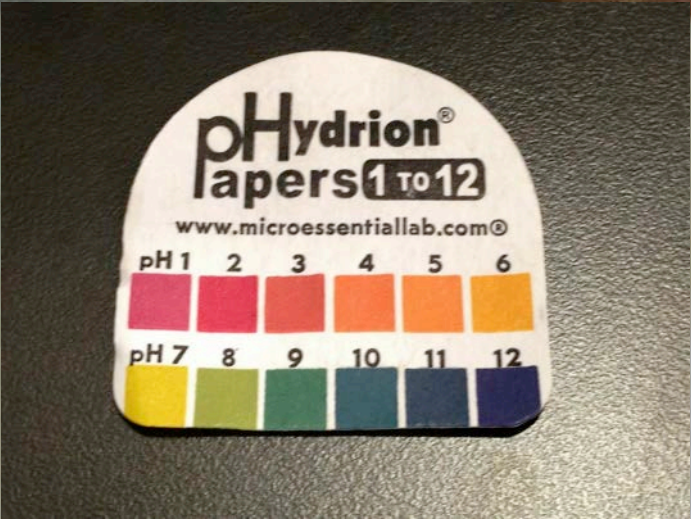
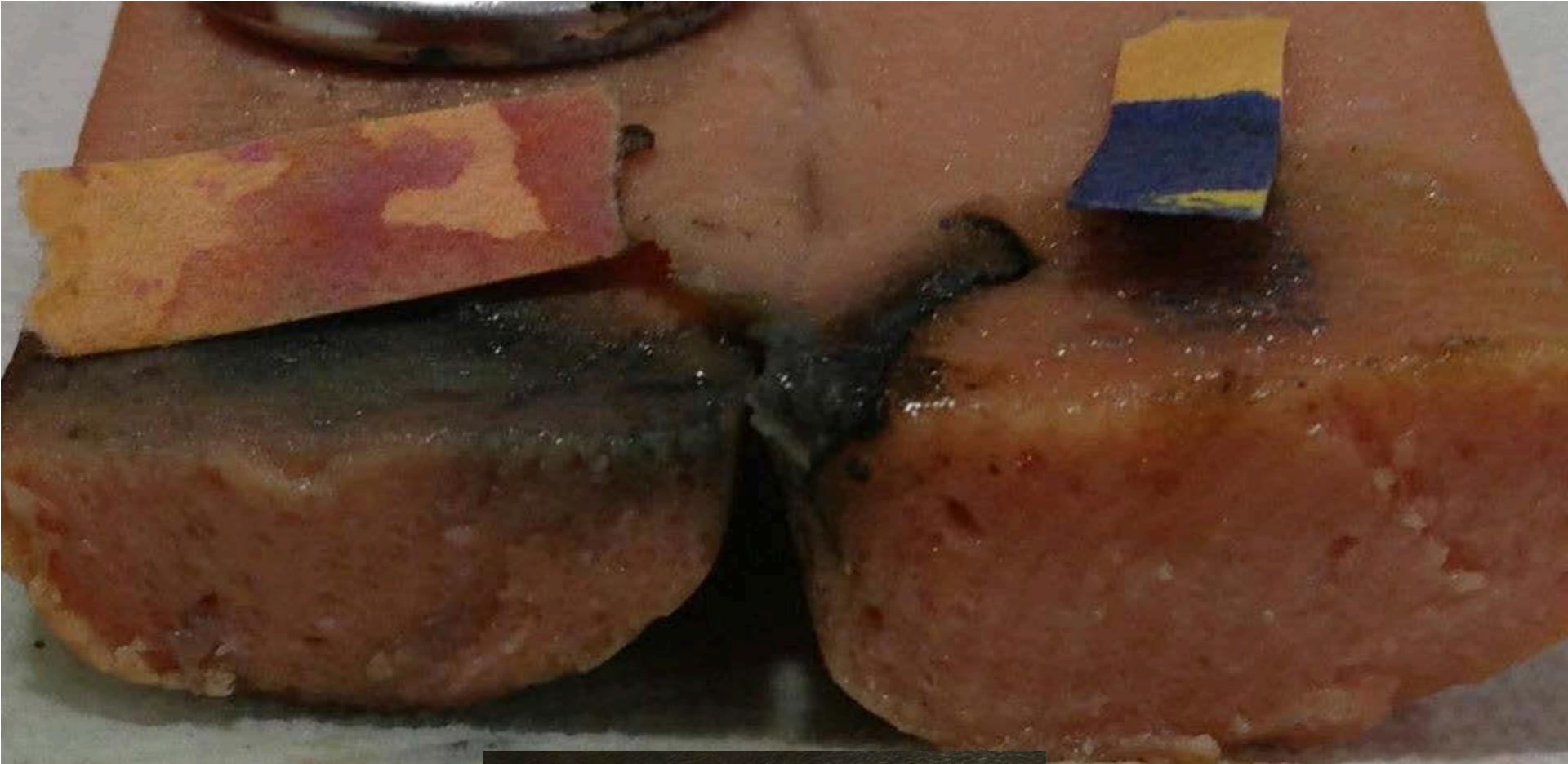


60 minutes



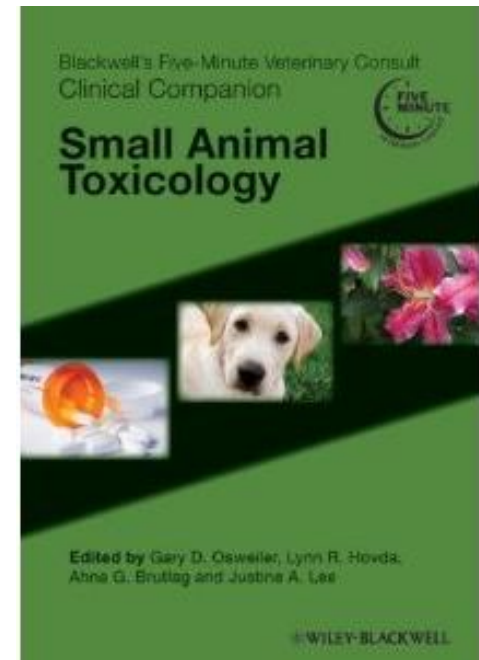
120 minutes





When in doubt, call for the bad ones:

- Something you're not familiar or comfortable with
- ADD medications
- NSAID overdoses
- SSRIs
- Lithium batteries



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

PET POISON HELPLINE



Did you get your “wheel of vomit”?

info@petpoisonhelpline.com

For veterinary clinics only – one per clinic!



WHEEL OF VOMIT

For assistance with a patient, call Pet Poison Helpline at
800-213-6680 866-VET-4VPI
(866-838-4874)

©2012 Veterinary Pet Insurance Company. Nationwide Insurance, an affiliate member of Nationwide Mutual Insurance Company. 11/07/12

Decontamination should only be performed when appropriate. When in doubt, Pet Poison Helpline should be consulted. This calculator should be used as a guideline only. Doses should be based on lean body weight. Please be aware there are ranges in dosing and additional dosing may be necessary.

Dosing for hydrogen peroxide, 3% in dogs: Give 1 ml/kg PO; if no emesis in 5-10 minutes, give 2 ml/kg PO. Do not exceed 5 ml/kg PO total. When you should not induce emesis: symptomatic patient, risk of aspiration pneumonia, certain toxicants (e.g. hydrocarbons, corrosives, etc).

Emetics that are no longer recommended: syrup of ipecac, salt, mustard.

Activated charcoal is not recommended following ingestion of specific toxicants such as corrosives, ethylene glycol, heavy metals, hydrocarbons, xylitol, paint balls, salt, etc.

Hydrogen peroxide, 3% (Dosage: 1 ml/kg PO)
Dose listed in ml (FOR DOGS ONLY)

Apomorphine (Dosage: 0.02 mg/kg IV)
Dose listed in mg (FOR DOGS ONLY)

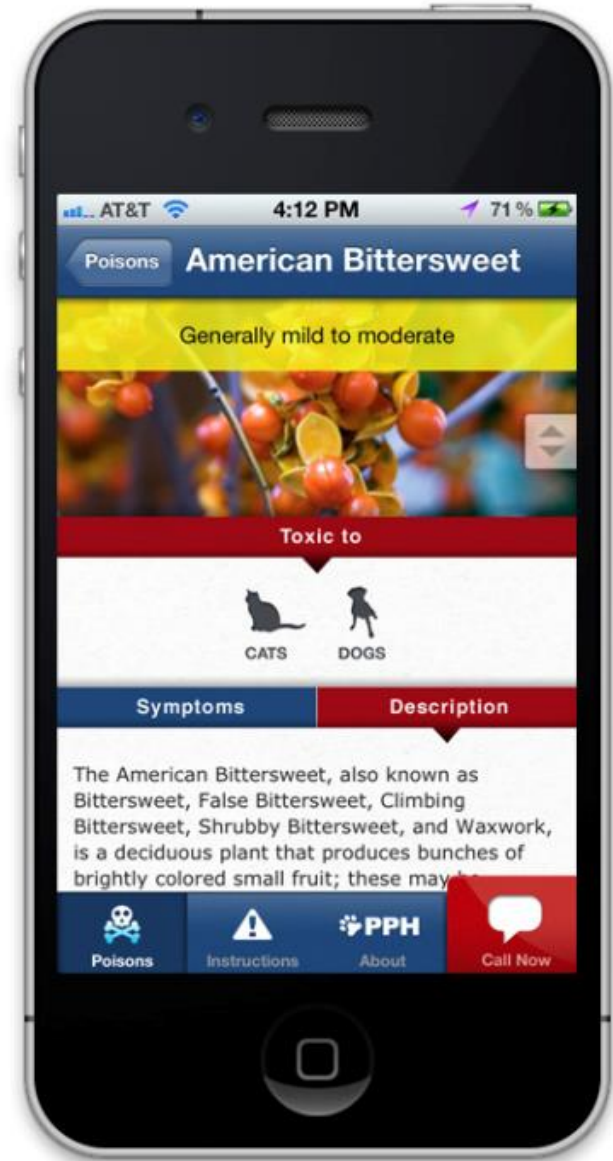
WEIGHT OF DOG
IN POUNDS

Activated charcoal dose (Dosage: 1 gram/kg PO)
Dose listed in grams (FOR DOG)

Activated charcoal (Dosage: 5 grams/kg PO)
Dose listed in grams (FOR DOG)

Our iPhone app!

- Must have for pet owners!
- Only \$1.99
- Free info!





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 1pm central time, Oct 9, 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

Acknowledgements

Dr. Lynn Hovda

&

Dr. Justine Lee

Thank you for your contributions!

Self-study

There just wasn't enough time to cover everything we'd hoped to get through. Below are a short selection of slides which we think you'll benefit from. We've included references to other webinars which will provide more detail, as well as reference to published articles.

Enjoy!

Bulb Fertilizers

- Contain
 - Nitrogen
 - Phosphate
 - Potash
- Typically wide margin of safety
- Beware massive ingestion
- See PPH Webinar, *Plants Poisonous to Small Animals*, April 2012
www.petpoisonhelpline.com, For Vets page



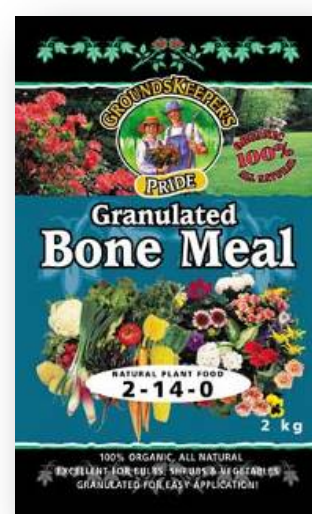
Bone meal/blood meal:

- “Organic” but still dangerous!
- Palatable!
- Mixed in with ???
 - Organophosphate granules?
 - Spring bulbs?



Bone meal/blood meal:

- **Clinical signs:**
 - Vomiting
 - Pancreatitis
 - Foreign body obstruction
- **Treatment:**
 - Radiographs to evaluate size of bezoar (bone)
 - Gastric lavage to break up
 - Anti-emetics
 - Fluid therapy
 - IV fluids
 - SQ fluids
 - Supportive care





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**



Oxygen absorbers – risk to pets?

- Potential for iron poisoning in small dogs
 - See PPH Webinar, *Baby Products Poisonous to Pets*, April 2013 for iron poisoning detail (www.petpoisonhelpline.com)

J. Med. Toxicol.
DOI 10.1007/s13181-011-0201-3

VETERINARY TOXICOLOGY

Iron Intoxication in a Dog Consequent to the Ingestion of Oxygen Absorber Sachets in Pet Treat Packaging

A. G. Brutlag • C. T. C. Flint • B. Puschner