


PET POISON HELPLINE®


Decontamination: So Much More Than Vomiting!

Tabatha Regehr, DVM
Consulting Veterinarian, Clinical Toxicology
Pet Poison Helpline

April 6th, 2021



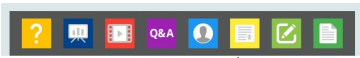
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The green “resource” widget contains downloadable presentation slides, instructions on how to download your CE certificate, a link to take our survey, and links to further information about Pet Poison Helpline.



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What is Pet Poison Helpline?

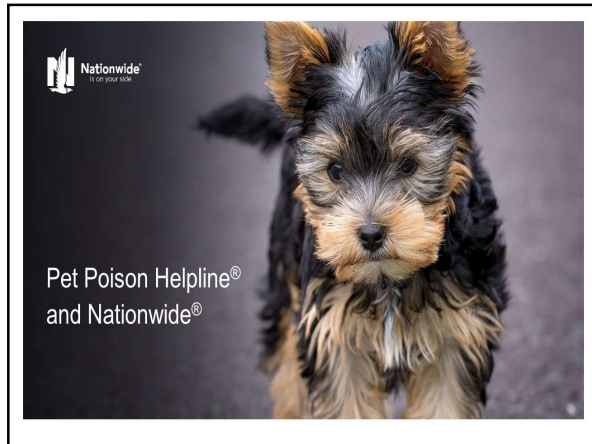


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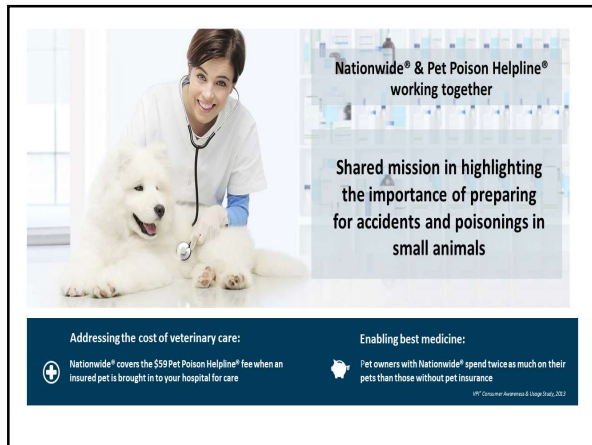

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- **24/7 animal poison control center**
- **Veterinary & human expertise**
 - 20+ DVMs, 75+ CVTs
 - DABVT, DABT
 - DACVECC
 - DACVIM
 - 10 PharmDs
 - 2 MDs
- **Case fee of \$65 includes:**
 - Unlimited consultation
 - Fax or email of case report
- **Educational Center**
 - Free webinars (archived)
 - Wheel of Vomit
 - Textbook
 - Newsletters for vet professionals
 - Free resources for clinics
 - Videos
 - Electronic material
 - Clings
 - Social media graphics

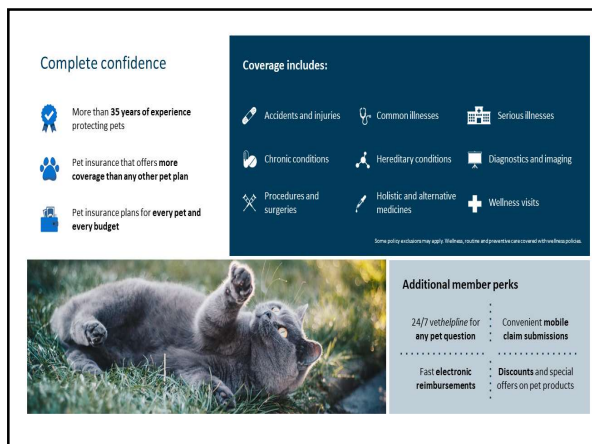
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Pet insurance plan options for coverage

	whole pet [®] with wellness	whole pet [®]	major medical	pet wellness
Accidents, such as poisonings and snake bites	✓	✓	✓	
Injuries, such as ACL, bite wounds, and broken bones	✓	✓	✓	
Illnesses, such as ear infections, vomiting, diabetes and cancer	✓	✓	✓	
Exams, including treatment and prescribed medications	✓	✓	✓	
Hospitalization, including x-rays, blood work, and surgeries	✓	✓	✓	
Hereditary and congenital conditions	✓	✓	Limited	
Wellness exams, including vaccinations, flea control and more	✓			✓
Reimbursement type	90%	90%	Benefit schedule	Benefit schedule

 All plans include a one-time annual deductible
 Annual deductible must be met before reimbursement
 90% reimburses all eligible services on invoice
 Benefit schedule reimburses based on a published list

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Decontamination: So Much More Than Vomiting!

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Today's Goals

Review	Review the different methods of decontamination
Discuss	Discuss the pros and cons of each method of decontamination
Discuss	Discuss how to choose the ideal decontamination method


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Decontamination methods: Types

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Decontamination methods - ocular

Indications

- Irritants or corrosives
- Foreign material
- Owner should start at home if possible

Flush preferences

- Eye wash
- Tap water
- LRS or saline
- ⊘ No red eye reducer/eye drops

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Decontamination methods: Ocular

Irritant

- Owner may be able to perform
- Irrigate for 10-15 minutes
- Monitor for signs of irritation
 - Pawing or rubbing at the eye
 - Redness
 - Lacrimation
 - Squinting
 - Swelling
- Symptomatic pets should be evaluated by DVM

Corrosive

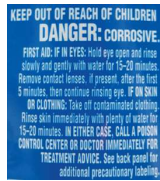
- Owner should attempt to irrigate at home for 15-20 minutes
- Veterinarian should irrigate the eye for 15-20 minutes with eye wash
- Fluorescein stain
- Topical antibiotic ointment or drops
- Elizabethan collar (E-collar) to preventing self-trauma
- Monitor for signs or worsening

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Product labels – Signal Words

Caution

Risk of significant illness/injury is low
Mild redness/irritation
Many Ready To Use products



Danger

Risk of significant illness/injury is high
Common with corrosive products
Alkaline pH >11.5
Acid pH <2-3
Many concentrated products

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Decontamination Methods – Dermal

Indications

- Corrosives or Irritants
- Systemically absorbed toxins
 - Tea tree oil (concentrated)
 - Topical analgesics, hormones, chemotherapeutics (5 FU)
 - Psoriasis creams (calcipotriene)
- Glues or Adhesives
- Paresthesia
- Blue-Green algae
- To prevent self grooming



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Decontamination methods - dermal

Therapies

- Irritants and Corrosives
 - As discussed for ocular exposures
- Systemically absorbed toxins
 - Bath 2-3 times with degreasing dish soap
 - +/- activated charcoal
 - +/- blood work
 - Analgesia
- Paresthesia
 - Bathe 2-3 times with degreasing dish soap
 - Cool compress, Vitamin E oil (efficacy)
- Glues/adhesives
 - Loosen with vegetable oil
 - Clip hair



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Decontamination Methods -Inhalants

Indications

- Concentrates or corrosives
 - Bleach & Ammonia mixtures
- Smoke inhalation
- Gasses
 - Chlorine
 - Carbon Monoxide
 - decreased O2 carrying capacity
 - Hydrogen Cyanide
 - cyanide toxicity



Photo credit - Microsoft stock image library

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Decontamination methods – Inhalation

Therapies

- Remove animal from source
- Fresh air (outdoors)
- Oxygen
- Positive pressure ventilation
- Pt with underlying respiratory disease

Birds

- Very sensitive
- Fragrance, respiratory irritants
- Teflon/Polytetrafluoroethylene (PTFE)
 - 536°F



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Decontamination methods – GI

Vomiting/Emesis

Activated Charcoal

Cathartics

Gastric lavage

Whole bowel irrigation (WBI)

Endoscopy/Surgery



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Decontamination methods – Emesis

Gastric Content Recovery

- 49% (range 9-75%) w/emesis < 30 min. after ingestion
- 17-62% 1 hr after ingestion
- Emesis most common w/in 2 hrs after ingestion

Indications

- Asymptomatic
- Foods
- Medications
- Large ingestions
- Rodenticides
- Small, dull foreign objects
- No breed or health risk



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Decontamination methods: Emesis

Vomiting beyond 2 hrs post exposure

- Grapes, raisins, chocolate, gum
- Large plant ingestion
- Massive ingestions
- Drugs that decrease gastric emptying
 - Opioids
 - Salicylates
 - Anticholinergics
 - Tricyclic antidepressants



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Decontamination methods: Emesis

Contraindications

- Symptomatic patients
- Already vomited to bile/empty
- History or risks of aspiration pneumonia
 - Laryngeal paralysis, megaesophagus
- Sharp/dangerous objects
- Corrosive agent
 - Punctured dry cell batteries
 - Alkaline substances pH>11
 - Acidic substances pH<3
- Hydrocarbons
 - Fuels: Gasoline, Kerosene
 - Motor oil



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Decontamination methods: Emesis in Dogs

Apomorphine

Dopaminergic drug
stimulates dopamine-2 receptors in CRTZ
0.03 mg/kg IV/0.04 mg/kg IM
Crush tablet for conjunctival administration
½ tablet for small dog, 1 tablet for large dog
Reversal: Naloxone for sedation, Anti-emetic for nausea



Hydrogen peroxide

3%, fresh, bubbly, non-expired
Gastric irritant
1-2 mL/kg, max 50mLs TOTAL (may exceed in larger dogs to 60-75mLs, case dependent)
(1 tsp/10 lbs, 1tbs/30 lbs)



Ropinirole (Clevor®)

D₂ receptor agonist in CRTZ
Reversal: Metoclopramide
Dogs only: 1-8 drops based on dosing chart
Not recommended for pregnant or lactating dogs. Should not be administered by pregnant or lactating women.



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Decontamination methods: Emesis in dogs – H2O2

7 Healthy dogs

- 1 control dog (apomorphine)
- 6 dogs received H2O2

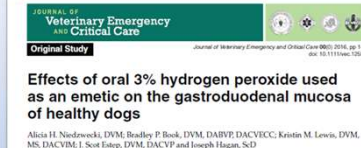
Visual assessment and bx

- 0, 4, & 24 hours
- 1- and 2-weeks post

Results

- 4 hrs – Visual gastric mucosal lesions
- Histo - hemorrhage
- 24 hrs – Worsening of gastric lesion, mild to moderate duodenal lesions evident
- Histo - cellular necrosis, mucosal edema
- 1 week – Visual inflammation
- 2 weeks – Most visible and histopathologic lesions resolved

Niedzwecki A, et al



Effects of oral 3% hydrogen peroxide used as an emetic on the gastroduodenal mucosa of healthy dogs

Alicia H. Niedzwecki, DVM, Bradley P. Bask, DVM, DABVP, DACVPC, Kristen M. Lewis, DVM, MS, DACVIM, J. Scott Eisele, DVM, DACVP and Joseph Hagan, ScD

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Decontamination methods: Emesis in dogs - Clevor




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Decontamination methods: Emesis in dogs - Clevor

Ropinirole (Clevor) - Approved Jun 2020

- Historically used in people for treatment of Restless Leg Syndrome & Parkinson's
- 95% of healthy dogs will vomit in 10-30 min
- Sold as 30 mg/ml solution in single dose container
 - Slight yellow color. Protect from light and discard any liquid after 30 min.
- 11-15 drops per vial

Administration

- If giving 2-4 drops, divide dose between both eyes.
- If giving 6-8 drops, divide administration by 1-2 min apart (give 2 drops OU, wait 1-2 min and give remaining dose)
- If no vomiting after 20 min, repeat same dose

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Decontamination methods: Emesis in dogs - Clevor

Safety and Side effects

- Not tested in dogs < 1.8kg (4 lbs), dogs < 4.5 months old, or in geriatric dogs.
- Ocular irritation, tachycardia, tachypnea, lethargy, ataxia, diarrhea, tremors
 - No new signs developed at doses up to 5x the labeled recommendation
- Caution
 - Patients with underlying heart disease
 - Patients with underlying liver disease
 - Use caution in dogs with ocular disease
 - Not recommended for pregnant or lactating dogs
 - Should not be administered by pregnant or lactating women

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Clevor Dosing Chart

Body weight (kg)	Body surface area	Number of drops	Ropinirole mcg
1.8-5	0.15-0.3	1	810
5.1-10	0.3-0.47	2	1620
10.1-20	0.48-0.75	3	2430
20.1-35	0.75-1.09	4	3240
35.1-60	1.1-1.57	6	4860
60.1-100	1.57-2.21	8	6480

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Decontamination methods: Emesis in Cats

Xylazine
 α -2 adrenergic agonist
 0.44 mg/kg IM, Efficacy may be as low as 43%
 Antidote: Yohimbine 0.25-0.5mg/kg IM
 Risks: Excessive sedation, cardiovascular collapse



Dexmedetomidine
 α -2 adrenergic agonist
 5-10 mcg/kg IM, Efficacy – up to 58-81%
 Antidote: Atipamezole given at equal volume IM
 Risks: Excessive sedation, cardiovascular collapse



Hydromorphone
 0.1 mg/kg SC
 Emesis approx. 75% effective
 More cardiac sparing and less sedating than dexmedetomidine
 Antidote: 0.04 mg/kg Naloxone for sedation, Anti-emetic for nausea
 Risks: Hyperthermia (opioids)






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Dexmedetomidine vs. xylazine in cats

Thawley and Drobitz	Willey et al
43 cats in study - H2O2: - No emesis in 3 of 3 cats 0%. (1tsp/5-10lbs body weight) - Xylazine: - Emesis occurred in 11 out of 25 cats 44%. (Median dose 0.44 mg/kg) - Median time to emesis 10 minutes - Dexmedetomidine: - Emesis occurred in 13 out of 16 cats 81% (median dose 7 mcg/kg IM) - Median time to emesis 5 minutes	47 cats in study - Xylazine: - Emesis occurred in 9 out of 21 cats 43% (0.36-64mg/kg IM) - Dexmedetomidine: - Emesis occurred in 15 out of 26 cats 58% (6-18 mcg/kg IM) Main side effect for all was sedation

Willey JL, et al. Evaluation and comparison of xylazine hydrochloride and dexmedetomidine hydrochloride for the induction of emesis in cat: 47 cases (2007-2013). JAVMA 2016; 248(8): 923-927

Thawley VL, Drobitz KJ. Assessment of dexmedetomidine and other agents for emesis induction in cats: 43 cases (2009-2014). JAVMA 2015; 247 (22):1415-1418




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Emesis in Cats: Methods not recommended

Hydrogen peroxide

- Not very effective
- Hemorrhagic gastritis
- Fatalities have occurred



Apomorphine

- Not effective
- Possible over-stimulation of CNS
- CRTZ stimulated by α -2 agonists in cats vs. dopaminergic receptors






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Decontamination methods to avoid

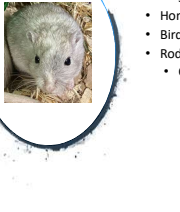
- Salt: Hyponatremia
- Syrup of ipecac: Cardiac effects and prolonged vomiting
- Digital stimulation: Physical injury
- Liquid dish soap: Ineffective, aspiration risk
- Mustard
- Spinning in a chair



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Decontamination methods: Emesis





Species to avoid vomiting attempts

- Rabbits
- Ruminants
 - Sheep, cattle, llamas, goats
- Horses
- Birds
- Rodents
 - Chinchillas, rats, gerbils

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Decontamination methods: Activated Charcoal

- Carbon residue derived from vegetable material (wood pulp)
- Produced by exposing biomaterial to an oxidizing gas at high temps (900°C)
- Forms network of fine pores within the charcoal
- Covers larger surface area compared to weight






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Decontamination methods: Activated charcoal

Pros	Cons
• Readily available • Relatively inexpensive • Suspected to bind most toxicants • May ↓ absorption by 25-30% w/delayed administration • Can administer with food	• Window for administration • Hypernatremia • Difficult to administer • Messy • Vomiting after administration • Diarrhea/changes to stool • Binds to therapeutic medications • Unknown benefit

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 **Decontamination methods – Activated Charcoal**

• Patient contraindications • +/- symptomatic patients • Dehydration • Hypernatremia • Hypovolemia • Decreased GI motility/ileus • Recent abdominal sx • Protracted vomiting • Obstruction potential	• Not expected to bind with.. • Xylitol (sugar alcohols) • Caphor • Metaldehyde • Petroleum distillates/hydrocarbons • Heavy Metals • Corrosive chemicals • Ammonia • Borates • Bromides • Fluoride
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Decontamination methods: Activated charcoal

Dosing:
 Standard dose 1-2g/kg PO
 1-5g/kg (Plumb's)
 5-10 ml/# ToxicBan

Multi-dose
 Repeat in 6-8 hours if ER formula medication
 Repeat q 6-8 hours for 24 hours if enterohepatic recirculation occurs
 *Manufacturer suggests ½ the dosage, but gives no recommended dosing schedule
 PPH recommends full dosing at 1-2 g/kg every 6-8 hrs for 24 hrs, monitoring sodium between doses.



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Decontamination methods: Activated charcoal

UAA gel

Contains mixture of activated charcoal and clay

1/3 of administered amount is charcoal

No studies from manufacturer regarding efficacy of labeled dose

PPH recommends 3x the labeled dose for effectiveness (4-8 ml/#)

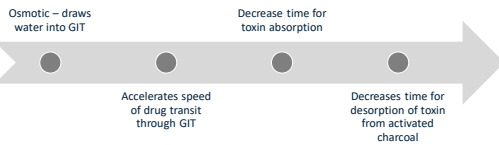


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Decontamination methods: Cathartics



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Decontamination Methods: Cathartics

• Sorbitol

- Potent cathartic
- Often in activated charcoal products
- 70% solution, 1-3 ml/kg PO

• Dose based on amount of charcoal if using a combination product.

Toxiban blue – No sorbitol
Toxiban red – Sorbitol



• Magnesium hydroxide

- Milk of magnesia 5-10 ml po q 8 hrs x 24 hrs
- Indicated for mild iron toxicity
- Contraindications
 - Cats – use caution
 - Bromethalin



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Decontamination methods: Gastric lavage

Indications - Species that do not vomit - Unsuccessful emesis attempt - Large volume of stomach content - Symptomatic patients with a large ingestion - Varies based on toxin - Potentially life-threatening toxin	Contraindications  - Hydrocarbon ingestions - Corrosives - Recent surgery - Unstable patients - Patients at higher risk for bleeding or injury - Inappropriate timeframe - Liquid toxins- limited benefit
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Decontamination methods: Gastric lavage








Photos courtesy of Dr. K. Peterson, PPH

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Decontamination methods: Whole bowel irrigation

- Indications
- Iron
- Enteric coated drugs
- Sustained or ER formulations
- Packets of drugs
- Uncommonly performed
- Polyethylene glycol
- NE or NG tube administration
- 25-40 ml/kg PO → followed by continuous oral infusion of 0.5 ml/kg/hr → radiographic clearance or clear effluent



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Decontamination methods – Endoscopy

- Indications
 - Pennies/Galvanized metals (zinc)
 - Non-leaking batteries
 - Button batteries
 - Patches
 - Fentanyl, lidocaine
 - Bottles/plastic
 - Other metals
 - Evaluate for injury to esophagus/stomach



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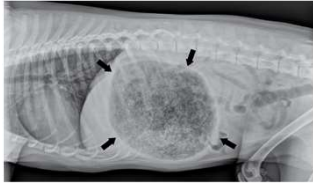
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Decontamination methods: Surgical removal

Surgical removal

- Gorilla glue* (Diisocyanates)
- Sharp objects
- Large foreign bodies
- Medication bezoars (rare)
- Leaking batteries
- Large # of objects
- +/- Bread dough



9 mo. Fl. Pit Bull Terrier.
12 hrs after ingesting 1.5 oz Gorilla Glue.
Photo credit: Dr. C. Angie

Limitations of endoscopic and surgical retrieval

- May be delayed pending stability of patient
- General anesthesia
- Cost
- Accessibility of equipment/staff
- Operator skill-Endoscopy

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Decontamination methods - Summary

When selecting the most appropriate method(s) of decontamination for your patient, remember to consider:

- Exposure type
- Time frame since exposure
- Signalment of patient
- Pros/Cons to decontaminate

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- 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
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Small Animal Toxicology
Second Edition
Lynn Hovda, Ahna Brutlag, Robert Poppenga, Katherine Peterson
WILEY Blackwell

Paperback | May 2016 | 960 pages | 978-1-119-03654-8 | \$109.99 · CAN \$120.99
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2021 Webinars Announced



- **May 13th**
 - The Caring Veterinary Medical Professional: Understanding the Grief Process
- **July 13th**
 - Hot Topic: To Be Announced
- **August 19th**
 - Couple-Care: Relationship First Aid for Veterinary Medical Professionals
- **October 5th**
 - Heavy Metal Toxins: Where They are Lurking May Surprise You
- **November 9th**
 - Seize the Day: Toxin Differentials in the Acutely Neurological Patient
- **November 11th**
 - Retrain Your Brain! Fun Techniques You're Going to Do Starting Now!

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Thank you for attending!



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



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