

TOP 5 INGESTIONS THAT REQUIRE INDUCTION OF EMESIS

Marie K. Holowaychuk, DVM, DACVECC
Critical Care Vet Consulting



Induction of emesis can be particularly important following the ingestion of certain toxins, especially those with a high risk for causing morbidity and mortality.



Induction of emesis is most efficacious within the first 1 to 2 hours of toxin ingestion.

Induction of emesis to achieve gastric decontamination has long been accepted as a mainstay of therapy for certain toxin ingestions in dogs and cats. Although this practice has little scientific evidence to support routine use, induction of emesis serves to remove as much of the ingested toxin as possible from the stomach before it can be absorbed or pass into the intestinal tract.¹ Induction of emesis is most efficacious within the first 1 to 2 hours of toxin ingestion; however, in cases of large ingestions, food ingestions (eg, chocolate, grapes, raisins), or concurrent ingestion of foreign material (eg, food wrappers), induction of emesis can still be efficacious 6 to 12 hours after the ingestion, especially if there is radiographic evidence of ingesta within the stomach.

1 Anticoagulant Rodenticides
Approximately 5 to 7 days after ingestion of anticoagulant rodenticides, a severe coagulopathy can develop via antagonism of vitamin K epoxide reductase, an enzyme required to activate clotting factors in the liver.

Animals are at risk for body cavity hemorrhage (hemoabdomen, hemothorax), hematomas, or bleeding into joints. Bleeding can be life-threatening, and affected animals require emergency treatment including oxygen therapy, vitamin K supplementation, and blood-product transfusions to replace clotting factors or red blood cells. Animals with a prolonged prothrombin time should receive vitamin K supplementation for 4 to 6 weeks—until prothrombin time measured 48 hours after discontinuation of vitamin K supplementation is normal.

To avoid development of life-threatening hemorrhage, induction of emesis within 6 hours of the anticoagulant rodenticide ingestion is recommended. This can be followed by oral administration of activated charcoal to

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1. Anticoagulant rodenticides
2. Chocolate
3. Grapes and raisins
4. Over-the-counter human pain relievers
5. Xylitol

reduce absorption and enhance removal of any remaining rodenticide. It is also advised that measurement of clotting times (eg, prothrombin time) be done within 48 to 72 hours of ingestion.²

In 1 study, only 8% of dogs managed with GI decontamination after anticoagulant rodenticide ingestion developed prolonged clotting times and none of those dogs required transfusions or had significant bleeding.² It is important to avoid the assumption that all rodenticides ingested by dogs are anticoagulants. The incidence of other rodenticide ingestions such as bromethalin, which causes severe neurologic signs, has increased dramatically in recent years.³

2 Chocolate
The toxic components of chocolate are methylxanthines (eg, theobromine, caffeine), which vary in concentration depending on the type of chocolate ingested (see **Relative Toxicity of Chocolate**). Theobromine is considered toxic when ingested in quantities >20 mg/kg and can cause such signs as vomiting, diarrhea, diuresis, hyperactivity, restlessness, incoordination, tachycardia, and arrhythmias. Severe signs occur at 45 to 50 mg/kg, and seizures occur at >60 mg/kg.⁴ Online calculators are available to assist veterinarians in determining whether the type and amount of chocolate ingested is considered toxic.⁵ If so, decontamination via

emesis induction followed by administration of activated charcoal is recommended. Because theobromine undergoes enterohepatic recirculation, repeated doses (every 4 to 6 hours, then every 8 to 12 hours) of activated charcoal (without a cathartic) can be given to decrease the half-life of theobromine.

Emesis can be effective more than 6 hours after the chocolate is ingested because chocolate can remain in the stomach long after ingestion, especially if ingested with plastic or foil wrappers.

3 Grapes and Raisins

Grapes and raisins are associated with the development of acute kidney injury when ingested by dogs. A dose-dependent relationship is not clear, which means that any ingested quantity could lead to the development of kidney injury if not treated.⁶ Likewise, the toxic principle of grapes or raisins is unknown, and there are no identified associations between the resulting kidney injury and grape or raisin type and species, pesticide use, and type of farming (eg, organic). Signs of acute kidney injury usually develop within 24 hours of ingestion and can be prevented with early induction of emesis followed by administration of activated charcoal and IV fluids.⁷

4 Over-the-Counter Human Pain Relievers

Human medications purchased over the counter are consistently the most common toxin ingestion reported to animal poison control centers, accounting for 25% of all intoxicants.⁸ Acetaminophen is the most commonly reported, followed by ibuprofen.⁸ Both of these medications are readily found in most households and can cause serious clinical signs if ingested and not promptly treated. Ingestion of acetaminophen can cause methemoglobinemia at doses as low as

RELATIVE TOXICITY OF CHOCOLATE IN THEOBROMINE LEVELS (MG/OZ)*



*From least to most toxic, based on theobromine concentration. With data from vet.purdue.edu/vth/sacp/documents/ChocolateToxicityinDogs_000.pdf.

10 to 50 mg/kg in cats or acute liver failure at doses >200 to 500 mg/kg in dogs, whereas ingestion of ibuprofen can cause severe GI signs or ulceration, acute kidney or liver injury, and neurologic signs in a dose-dependent manner starting at 100 to 125 mg/kg. Should a toxic dose of acetaminophen or ibuprofen be ingested by a cat or dog, emesis induction should occur as soon as possible as long as no contraindications (eg, altered mental status, already vomiting) exist. Early induction of emesis (ie, within minutes of ingestion) is especially important in cases of ingestion of fast-acting medications such as gelscaps that are rapidly absorbed from the stomach.

After emesis induction, repeated doses of oral activated charcoal should be administered over the first 24 to 48 hours (as is done for chocolate ingestions) to ensure the adsorption of any remaining medication; hospitalization and supportive care should be provided depending on clinical signs and laboratory abnormalities.

Hospitalization and supportive care should be provided depending on signs and laboratory abnormalities.



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▲ Xylitol is available in bulk in some stores and can pose a serious hazard to dogs if ingested.

5 Xylitol The popular sweetener xylitol is considered a sugar substitute and is commonly used in gum, candy, vitamins, dental products, and low glycemic-index baked goods (**Figure 1**). When ingested by dogs in relatively small amounts (50 to 100 mg/kg), it causes excessive insulin secretion leading to severe hypoglycemia, weakness, lethargy, and seizures within 30 minutes to 12 hours of ingestion. If ingested in large quantities (500 mg/kg), such as that contained in products baked with xylitol, it can cause severe acute liver failure and coagulopathies within 24 hours of ingestion.⁹

The prognosis for successful recovery in dogs is good if treated promptly and if limited to uncomplicated hypoglycemia, but prognosis becomes guarded in dogs that develop liver failure.¹⁰ As such, GI decontamination with prompt emesis induction is important as soon as possible after ingestion of xylitol-containing products.

Activated charcoal is not successful in binding xylitol because of its small molecular size.

Conclusion

Prompt induction of emesis is essential after certain ingestions to reduce the exposure to the toxin and decrease the risk for developing life-threatening clinical signs. ■

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