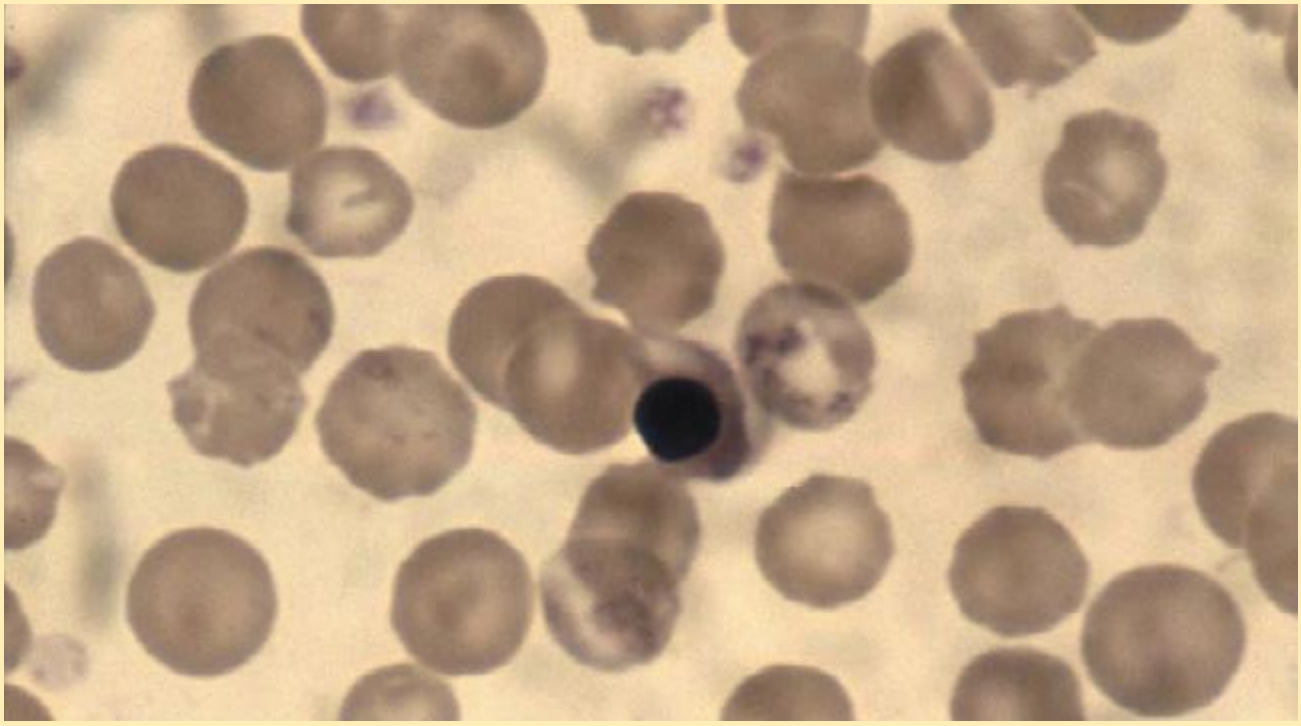
Question

A 1-year-old female spayed Corgi presents for a **seizure**. At home, she vomited what appeared to be **paint chips**. Peripheral blood cytology and a complete blood count showed 20 **nucleated** red blood cells/100 white blood cells, **basophilic stippling**, and a neutrophilic leukocytosis (see image). She received a dose of diazepam, which has controlled her seizures. What is the treatment of choice?



- Ca-EDTA
- N-acetylcysteine
- D-penacillamine
- Doxycycline

Explanation - This dog is showing signs of lead poisoning. Clinical signs are primarily gastrointestinal and neurologic. Animals are usually exposed in old buildings or areas of renovation where they have access to lead paint, old batteries, lead fishing weights, etc. Old food and water dishes can also be a source if lead paint was used. Lead blood levels can be measured; however, they do not necessarily correlate with severity of clinical signs. Toxic blood levels are greater than 0.4 ppm. Bloodwork can show an elevated number of nucleated RBCs without anemia. Basophilic stippling is a classic finding with lead toxicity but not specific. Ca-EDTA is the chelator used to treat lead poisoning. Succimer can also be given orally. D-penacillamine has also been used to chelate lead, copper, iron and mercury. It is used more commonly for copper toxicity. N-acetylcysteine is used for acetaminophen toxicity and hepatotoxicity. Basophilic stippling can sometimes be confused with erythrocytic parasites for which doxycycline may be the treatment of choice.

Question

A 4-year old male neutered Pit Bull mix comes in to your clinic because his owner thinks he might have gotten into rodenticide while she was out of the house 2 hours ago but is not sure. You send her to bring back the box of rodenticide and induce emesis by administering subconjunctival apomorphine. Within 5 minutes, the dog vomits the material shown in the image below. You rinse out the conjunctiva and administer oral activated charcoal. The owner returns with a box of rodenticide that says brodifacoum. What should you recommend?

- Treat the dog with vitamin K1 for 6 weeks
- Hospitalize the dog for 24 hours to monitor and treat potential neurologic signs
- Check serum calcium levels today and once weekly for 6 weeks
- Treat the dog with vitamin E and selenium
- No additional treatment or monitoring is needed

Explanation - The bright green vomit confirms the owner's suspicion of rodenticide ingestion because many rat poisons contain a bright green dye. Dogs that ingest these products may have bright green vomit or stool. Brodifacoum is a vitamin K antagonist commonly used in rodenticides. Ingestion of this compound causes hemorrhaging after several days due to a lack of production of new clotting factors. Treatment for this condition requires vitamin K1 administration for 4-6 weeks.

Question

Which of these would you expect to be prolonged soonest after ingestion of an anticoagulant rodenticide by a dog?

- Partial thromboplastin time (PTT)
- Activated Clotting Time (ACT)
- Thrombin time (TT)

- Prothrombin time (PT)

Explanation - The correct answer is PT. These compounds act by inhibiting vitamin K, which is required for synthesis of clotting factors II, VII, IX, and X. Factor VII has the shortest half-life of these and will be depleted first. Since PT measures the extrinsic system which contains factor VII, it becomes prolonged first.

Question

A 2-year old female spayed mixed breed dog presents in acute oliguric renal failure. The dog has a history of drinking ethylene glycol two days ago. What step should be taken next?

- Start treating the dog with 4-Methylpyrazole IV and give a guarded to poor prognosis to the owner.
- Start treating the dog with activated charcoal orally and tell the owner the dog has a guarded prognosis.
- Start treating the dog with ethanol IV and give a guarded to poor prognosis to the owner.
- Tell the owner the dog has a guarded to poor prognosis and may need hemodialysis.

Explanation - The correct answer is tell the owner the dog has a guarded to poor prognosis and may need hemodialysis. 4-MP and ethanol act by preventing alcohol dehydrogenase from converting ethylene glycol to its toxic metabolites. In animals where oliguric renal failure has already begun, most of the ethylene glycol will already have been metabolized, so there is no benefit to giving ethanol or 4-MP. Activated charcoal should only be given if the ethylene glycol was ingested within 2 hours.

Question

Which of the following is not a clinical sign you would see in a dog with chocolate toxicosis?

- Diarrhea
- Cardiac tachyarrhythmias
- Seizures
- Coagulopathy
- Hyperactivity

Explanation - The correct answer is coagulopathy. The toxic principle of chocolate is methylxanthines (specifically theobromine and caffeine). Methylxanthines can cause CNS excitation tachycardia, and vasoconstriction. Signs include vomiting, diarrhea, hyperactivity, polyuria, polydipsia, lethargy, tachycardia, cardiac arrhythmias, seizures, and death.

Question

You ask your technician to give a 1 ml/kg dose of lidocaine to a dog that is having ventricular premature complexes. You realize after it is too late that she miscalculated the dose and gave 10 times what you asked for. What is the most common early sign of lidocaine toxicity in dogs?

- Apnea
- Anaphylaxis
- Profound bradycardia
- Peripheral neuropathy
- Central nervous system depression

Explanation - In dogs, toxicity of lidocaine is manifest primarily as CNS signs. Drowsiness or agitation may progress to muscle twitching and convulsions at higher doses. This occurs before respiratory or cardiac depression. Hypotension may develop if an IV bolus is given too rapidly.

Cats are more sensitive to lidocaine toxicity and may show cardiac suppression and CNS excitation.

Question

Zinc toxicity from ingestion of pennies minted after 1983 can cause which of the following?

- Coagulopathy
- Hemolysis
- Muscle spasms
- Thrombocytopenia

Explanation - The correct answer is hemolysis. Zinc causes a Heinz body anemia and hemolysis.

Question

Which of these is an effective drug to induce emesis in the dog?

- Apomorphine
- Xylazine
- Magnesium hydroxide
- Azathioprine

Explanation - The correct answer is apomorphine. Apomorphine is an opioid dopaminergic agonist that acts on the chemoreceptor trigger zone to induce vomiting in dogs. In can be administered IM, SC, IV, or in the conjunctival sac. Xylazine is a fairly effective emetic in the cat but is not used in the dog for this purpose. Azathioprine is an immunosuppressive drug not used to induce vomiting. Magnesium hydroxide or Milk of Magnesia is a cathartic but is not used for vomiting.

Question

For which of the following toxins, when ingested by a dog, should you not induce emesis?

- Bromethalin
- Chocolate
- Gasoline
- Brodifacoum

Explanation - The correct answer is gasoline. Emesis, if you can initiate it soon after exposure to a toxin, is a very effective means of decontamination. The times that emesis is not appropriate is for caustic (acid or alkali) substances and substances that are volatile and may be inhaled, causing pulmonary toxicity or aspiration pneumonia. The other contraindication to inducing emesis is the patient that is not awake enough to ensure that they can protect their airway and prevent aspiration.

Question

A 6-year old male neutered terrier mix weighing 10kg presents to you after having ingested 3 pieces of sugar-free gum containing xylitol. What bloodwork abnormality are you expecting to find?

- Hypoglycemia
- Hypocalcemia
- Hypernatremia
- Hyperglycemia

Explanation - Xylitol is a sugar alcohol present in sugar-free gum that, when ingested, causes a rapid release of insulin in dogs. After ingestion, clinically significant hypoglycemia can develop within 30 minutes and can last for more than 12 hours. Acute hepatic necrosis and failure after higher doses of xylitol ingestion can occur as well.

Question

Which of these forms of chocolate contains the highest concentration of theobromine?

- Semi-sweet chocolate
- Milk chocolate
- White chocolate
- Unsweetened baking chocolate

Explanation - The correct answer is unsweetened baking chocolate. This contains about 7 times more theobromine than milk chocolate. White chocolate has very little methylxanthines. Semi-sweet chocolate is in between.

Question

Which of these is an appropriate treatment for a dog that has ingested diluted bleach within the past 10 minutes?

- Administer non-steroidal anti-inflammatory drugs
- Administer milk to dilute the stomach contents
- Administer activated charcoal
- Administer apomorphine
- Administer intravenous fluids

Explanation - The correct answer is to dilute the stomach contents with milk. Bleach, even when diluted can be corrosive as can many household cleaners. This can result in severe burning of the mouth, esophagus, and stomach. Lesions from acids usually appear soon after exposure, while lesions from alkalis may not appear until 8-12 hours later. Do not induce vomiting with apomorphine because further damage can occur to the esophagus. Activated charcoal does not bind to these products and shouldn't be used. IV fluids are unlikely to be of any benefit immediately following the ingestion of the bleach unless the animal already happens to be sick or dehydrated. NSAIDs may help with pain or discomfort but can also contribute to the formation of ulcers within the GI tract. The recommended course of action is to dilute with milk or water and start GI protectants for several days. If the patient becomes depressed or anorectic, evaluate it for ulcers.

Question

What is the most common drug of choice when inducing emesis in dogs that have ingested an undesired substance? How would you treat an adverse reaction to it?

- Table Salt, GI lavage
- Syrup of Ipecac, activated charcoal
- Xylazine, yohimbine
- Hydrogen peroxide, Omeprazole
- Apomorphine, Naloxone

Explanation - Apomorphine is the drug of choice to induce emesis in dogs that have eaten a toxic substance. Apomorphine is a dopamine agonist and may be reversed with naloxone.

Syrup of ipecac, hydrogen peroxide, and table salt are no longer recommended due to their risks of side effects and the variability in effectiveness.

Adverse effects are uncommon with appropriate doses of apomorphine but can include profound CNS depression or hyperexcitabilty, tachycardia or bradycardia, or respiratory depression.

Xylazine is the emetic of choice in cats, and yohimbine, tolazoline, or atipamezole can be used for reversal.

Question

Which of the following is not an appropriate recommendation for treating an animal that ingested anticoagulant rodenticide within the past 4 hours?

- Give plasma
- Administer activated charcoal
- Give Vitamin K1
- Induce emesis

Explanation - The correct answer is give plasma. It takes at least a few days for anticoagulant rodenticides to cause prolonged bleeding times and clinical hemorrhage. This could likely be prevented with early intervention with decontamination and Vitamin K1 administration. A plasma transfusion at this stage is unnecessary and should be reserved for patients that have prolonged bleeding times.

Question

Which of these compounds is an antidote for ethylene glycol toxicity?

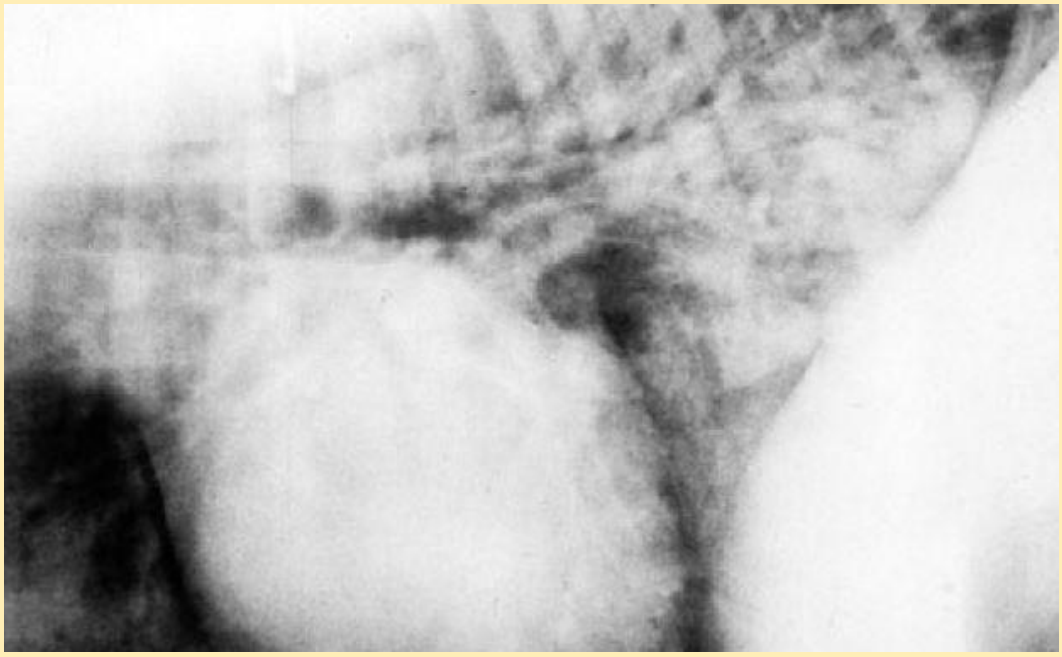
- 1,25 cholecalciferol
- 3-Methyl indole
- 4-Methylpyrazole
- 2-Pralidoxime

Explanation - The correct answer is 4-Methylpyrazole (4-MP). It is used to inhibit alcohol dehydrogenase and is considered the preferred treatment for treating ethylene glycol toxicoses in dogs. 4-MP does not cause hyperosmolality, metabolic acidosis, and CNS depression like ethanol treatment can. 4-MP is given to dogs IV over a 36-hour period. The initial dose is 20 mg/kg (slow IV over 15-30 minutes), then 15mg/kg (slow IV) at 12 and 24 hours, and then 5mg/kg is given at 36 hours. 4-MP is not effective in cats.

Question

A 4-year old male castrated Schnauzer presents after being rescued from a house fire. On presentation, the dog has a respiratory rate of 45 breaths per minute with increased inspiratory effort and moderate distress. The dog's mucous membranes are bright red. You take a lateral radiograph using minimal restraint (see photo).

What is the likely cause of the bright red color of the dog's mucous membranes?



- Thermal injury
- Ash
- Pulmonary hemorrhage
- Carbon monoxide
- Radon

Explanation - The bright red mucous membranes in a dog suspected of having smoke inhalation are concerning for **carbon monoxide toxicity**. Carbon monoxide displaces oxygen on hemoglobin molecules, forming **carboxyhemoglobin complexes**, which leads to tissue hypoxia.

The dog should be supplemented with 100% oxygen which reduces the half-life of the carboxyhemoglobin complexes from 4 hours on room air to 30 minutes.

Other treatments for smoke inhalation include humidifying the air to promote mucociliary clearance and to prevent drying injuries to the airways.

Question

You are treating an 8-year old mix breed terrier for ventricular tachycardia post splenectomy. You determine that you've given too much lidocaine to the patient. What clinical signs or laboratory findings are you most likely to see initially?

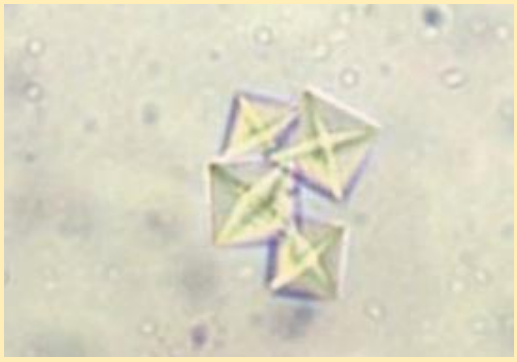
- Diarrhea
- Bradycardia and hypotension
- Muscle tremors and seizures

- Increased respiratory rate and difficulty breathing
- Methemoglobinemia

Explanation - Early clinical signs associated with lidocaine toxicity include neurological symptoms such as seizures and tremors. Nausea and vomiting may occur, but is usually transient. Cardiovascular and respiratory depression can also occur, but usually later on in the course of clinical signs.

Question

A 10-year old neutered mixed breed dog presents on emergency for 4 seizures in the past hour. On presentation he is mentally altered, ataxic, and dysphoric. The owner notes that the dog had spent the day outside with him while he worked. The dog had not vomited, had not eaten this evening, and had not had any bowel movements or urination. On physical exam the dog's heart rate is 142, respiration rate is panting, and temperature is 102 F. The heart and lungs are within normal limits. The abdomen is unremarkable, with no bladder palpated. In house CBC is unremarkable. Chemistry shows elevated BUN at 42 mg/dl, creatinine at 4 mg/dl, phosphorus 8 mg/dl, and potassium is 4 mmol/L. Abdominal ultrasound shows a very small bladder and kidneys with hyperechoic renal cortices. Urinalysis shows crystalluria (see image). Of the answer choices available, what is the treatment of choice and prognosis?



- Nephrectomy and dialysis necessary. Prognosis is fair to poor.
- Aggressive IV fluid therapy. Prognosis is guarded.
- Doxycycline, clavamox, and fluid therapy. Good prognosis.
- Aggressive fluid therapy. Excellent prognosis.

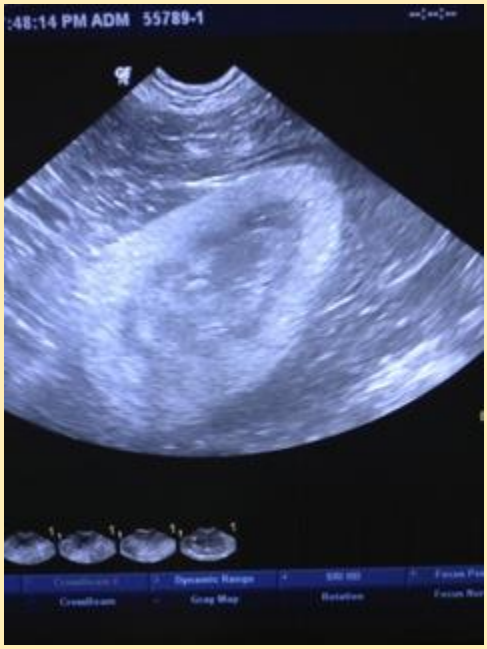
Explanation - The urine sediment shows calcium oxalate crystals which should increase your suspicion of ethylene glycol toxicity in this patient. The ultrasonographic image below depicts the severe cortical mineralization seen secondary to ethylene glycol toxicity ingestion in this patient. Ethylene Glycol toxicity has a guarded to poor prognosis in any animal that presents with acute anuric renal failure. Aggressive fluid therapy at 2-3 times maintenance, acid base control, and monitoring for urine production with indwelling catheter are needed. Dogs that do not begin to produce urine after appropriately rehydrated, typically do not survive. In dogs where urine production is reestablished continued aggressive therapy and rechecks are needed daily for 2-5 days after initial presentation, then weekly to biweekly after discharge for up to 2 months while the

kidneys recover. If available, dialysis can be an effective treatment option for many patients and some will consider this modality the treatment of choice.

Remember there are 3 phases to ethylene glycol intoxication:
1- Neurological signs within 30 minutes of ingestion: mild ataxia, depression, stupor, or knuckling. Often goes unnoticed. This stage lasts for 2-4 hours after ingestion.
2- Metabolic acidosis. Some signs of depression, tachypnea. Often goes unnoticed. This stage lasts 2-24hours.
3- Renal Failure. Can occur as early as 12 hours after ingestion (seen in cats). See depression, vomiting, and seizures.

The only stage where Fomepizole works is stage one. There is some controversy as to whether it can be beneficial to give in stage 2. This is also true for ethanol.

See Image kidneys on ultrasound after ethylene glycol intoxication.



Question

A client brings in her dog that recently ingested rodenticide. You check the box and see that the active ingredient is cholecalciferol. The dog appears clinically normal right now. What would you be concerned might happen if you do nothing at this time?

- Development of coagulopathy
- Development of organ mineralization
- Development of intestinal perforation
- Development of liver failure
- Development of neurologic signs

Explanation - The correct answer is development of tissue mineralization. Cholecalciferol (Vitamin D3) acts by becoming converted to calcitriol and increases calcium and phosphorus levels leading to mineralization of organs, especially the kidneys.

Question

Which of the following drugs and most common toxic reaction pairings is INCORRECT?

- Vincristine- paralytic ileus, axonal swelling and paranodal demyelination
- Meloxicam- acute renal failure
- Potassium bromide- pneumonitis
- Diazepam- fulminant hepatic necrosis
- Acetaminophen- paraphimosis

Explanation - Cats are unable to process acetaminophen because of deficiencies in the liver's ability to glucuronidate the drug into a form that can be excreted by the body. When the liver's enzyme pathways for glucuronidation is saturated, the drug is broken down into a toxic metabolite called NAPQI that damages hemoglobin and red blood cells and liver cells. This can lead to fatal methemoglobinemia followed by acute liver damage. Although liver failure and life threatening methemoglobinemia are the two primary processes that occur, some cats may develop renal failure from nephrotoxicity. Renal failure occurs more infrequently, however.

KBr use in cats has been linked to severe lower respiratory symptoms of pneumonitis in approximately 35% of cats.

Meloxicam, when given in multiple doses, has been linked to idiosyncratic renal failure in some cats.

Oral diazepam has also been linked to idiosyncratic fulminant hepatic necrosis in some cats.

Vincristine, is a microtubule poison. This drug can cause neuropathies such as paralytic ileus and demyelination.

Question

Which of these drugs should never be given to a cat?

- Prednisolone
- Acetaminophen
- Dexamethasone
- Diphenhydramine
- Ketoprofen

Explanation - The correct answer is acetaminophen. Because cats lack glutathione and the enzyme glucoronyl transferase, acetaminophen is metabolized differently. Cats accumulate toxins that result in **methemoglobinemia** and cell death. The blood becomes dark and the cats become dyspneic and develop facial edema. Immediate gastrointestinal decontamination is needed if the ingestion was within 2-3 hours. Treatment includes N-acetylcysteine, SAMe, vitamin C and supportive care.

Question

A 2-year old male neutered cat presents to you depressed, hypersalivating, and ataxic with muscle tremors. The owner reports that a pyrethrin-based spot-on formulation for flea control belonging to their Golden Retriever was accidentally applied on the cat earlier today. Which of the following drugs will you use to treat the cat's clinical signs?

- Methocarbamol
- Amoxicillin
- 2-PAM
- Atropine
- Acepromazine

Explanation - Pyrethrins alter the activity of the sodium ion channels of nerves, which prolongs the period of sodium conductance. This increases the length of depolarization resulting in repetitive nerve firing. Cats are particularly sensitive to pyrethrin-containing products and can develop clinical signs within hours after administration. Affected animals should be bathed to remove remaining product. Minor clinical signs such as hypersalivation and ear twitching are usually self-limiting and do not require treatment. Control of marked tremors or seizures can be achieved with methocarbamol (Robaxin).

Question

You are presented a 6-month male DSH for hypersalivation and tremoring. The owner applied an over the counter topical flea medication this morning when she found 2 fleas on him. She did not bring the box from the flea medication. How should you immediately treat the cat?

- IV dextrose to correct a likely hypoglycemia caused from the medication
- Rinse mouth out, activated charcoal
- Bath to wash off the medication, IV fluids, IV methocarbamol
- Rinse off the topical medication and recommend flea collar only for ectoparasite control in the future
- Warm water enema, IV fluids, IV diazepam

Explanation - This cat is apparently suffering from Pyrethrin toxicity. Many cats are sensitive to flea medications, especially some over the counter varieties. The medication should be quickly washed off with a bath. The mouth should also be carefully rinsed depending on the status of the cat if ingestion is suspected. This often happens with cats that groom then lick the medication from the paws. IV catheter and fluids should be started immediately. Methocarbamol, a muscle relaxant, is the first best choice to stop the tremoring. If this is unsuccessful, valium can also be used, and if active seizures are occurring should be given immediately. Phenobarbital or Propofol drip can be given if seizures are refractory.

It is not likely that this medication has caused a hypoglycemia and dextrose is not indicated. A warm water enema would not be helpful as the toxicity is not occurring due to absorption of medication from the cat's colon. Rinsing the mouth and activated charcoal may be indicated, but the initial treatments to stabilize the cat with the bath, fluids, and muscle relaxant are more critical on presentation.

Flea collars are often ineffective and many cats are sensitive to these as well. If the owner would like flea control, a veterinarian prescribed medication would be advised. Good choices for flea control include feline Frontline or Revolution.

Question

A 10-year old male castrated domestic short hair presents for lethargy. A blood smear shows Heinz bodies in the erythrocytes, and the blood is grossly brown in color. Which of the following is responsible for causing these changes in the blood of this cat?

- Chocolate toxicity
- Lily ingestion
- Acetaminophen administration
- Rodenticide toxicity
- Aspirin administration

Explanation - The correct answer is acetaminophen administration. The cat has signs of methemoglobinemia, which is caused by oxidative damage to the hemoglobin. Heinz bodies are usually present in animals with methemoglobinemia. Acetaminophen causes oxidative damage to cat blood due to the cat's inability to metabolize the drug efficiently.

Question

A 4-year old female spayed brown Tabby presents for depression, malaise, and vomiting for the past 12 hours. The cat is strictly indoors. There have been no changes in diet and the animal is not on any medications. The cat is 4% dehydrated, has edema along her face and paws, and she is depressed but responsive. Her mucous membranes are pale blue and capillary refill time is prolonged. Her heart rate is 220 beats per minute with no murmurs or arrhythmias, and her respiration rate is 72 breaths per minute. The cat is painful on abdominal palpation, but you do not palpate any abnormalities. Her temperature is 101.2F. The rest of the physical exam is unremarkable. In house blood work shows a HCT of 19%. Platelet and total protein counts are normal. ALT and ALP are both elevated. While starting treatment the cat urinates (see image). What is the treatment of choice?

- Gastric lavage and fomepizole
- Activated charcoal and SAMe
- Emesis and fluid therapy
- N-acetylcysteine and aggressive fluid therapy

Explanation - Acetaminophen toxicity is becoming more and more common in cats. Initial presenting signs can vary from asymptomatic if ingestion is recent to moribund or comatose, if greater then 12 hours. Acetaminophen undergoes glucuronidation in the liver to glutathione. This compound is toxic to the liver and red blood cells, and can cause hepatic necrosis, methemoglobinemia, methemoglobinuria (as seen in the image), anemia, hypoxemia, and death. Depending upon the stage the cat arrives in, treatment ranges from general decontamination if caught early, to hospitalization, blood transfusions, liver support, oxygen support, and N-acetylcysteine administration IV multiple times. N-acetylcysteine is a potent antioxidant believed to protect the liver from adverse effects of toxins.

Question

A client brings in her 3-year old cat who she heard scream in her basement and then found recumbent and vocalizing. Since then, the cat has become very rigid with muscle spasms. What could have happened?

- Wasp envenomation
- Copperhead snake bite
- Brown recluse spider bite
- Black widow spider bite

Explanation - The correct answer is black widow spider bite. Latrodectus mactans and L. hesperus are the scientific names for this spider. They make a toxin that binds to calcium channels, increasing membrane permeability and enhancing depolarization. Ascending motor paralysis and destruction of peripheral nerves endings occur. A single bite may be serious to adult humans and could kill a small animal. Clinical signs occur almost immediately with pain, due in part to the release of acetylcholine, which stimulates contraction of major muscle groups. There may be

ascending motor paralysis, muscle spasms, muscle rigidity, and salivation. Death from respiratory or cardiovascular failure is possible.

Question

A 12-year-old cat presents to your emergency clinic in critical condition after acute onset of icterus and lethargy over the past several days. The cat has been managed by another hospital for chronic renal insufficiency over several years. The cat's condition is deteriorating and the owners elect to euthanize the cat and request a postmortem evaluation. Results reveal that the cat had developed acute fulminant hepatic necrosis.

The owners had been treating the cat with several medications to manage complications of the cat's chronic renal insufficiency and poor appetite. Which of the following medications is implicated in causing hepatic necrosis in cats?

- Erythropoietin
- Enalapril
- Aluminum hydroxide
- Omeprazole
- Diazepam

Explanation - Diazepam is a benzodiazepine sedative that has been used effectively for appetite stimulation in cats, but administration has been associated with acute fulminant hepatic necrosis. The risk appears to be greatest if diazepam is administered repeatedly and orally. This side effect is thought to be related to metabolism of the drug in the liver to toxic metabolites. This is more severe when administered orally due to first pass metabolism. Cats that are glutathione deficient may be at increased risk.

The other drugs listed have not been associated with this type of liver failure in cats.

Omeprazole is a proton-pump inhibitor that is used to decrease gastric acid secretion. A potential side effect is an increase in liver enzymes but this is not thought to be harmful.

Aluminum hydroxide is a phosphorous binding agent used to decrease hyperphosphatemia. Potential side effects include hypophosphatemia, constipation, and aluminum toxicity (with prolonged use).

Enalapril is an angiotensin coverting enzyme (ACE) inhibitor used to manage hypertension and proteinuria. Side effects can include lethargy and inappetance or other GI signs.

Erythropoietin is a hormone that stimulates red blood cell production that is used to treat anemia. The most common side effect is anti-EPO antibodies that lead to refractory anemia.

Question

Which of these is an appropriate treatment for an animal showing signs of strychnine toxicity?

- 4-Methylpyrazole
- Vitamin K1
- Atropine
- 2-Pralidoxime
- Methocarbamol

Explanation - The correct answer is methocarbamol. Strychnine is found is some snail baits and other poisons. Strychnine competitively antagonizes the action of glycine and causes a loss of impulse control in the spinal cord and brainstem. Clinical signs can begin suddenly and progress from anxiety to tetanic convulsions spontaneously or in response to stimuli. The poison affects all striated muscles. There is no specific antidote, so treatment is symptomatic. Convulsions can be controlled with anesthetic drugs and/or methocarbamol. Stimulation should be prevented.

Question

A 4-year old male Manx cat presents to you because the owners found an empty, opened pill vial in the bathroom and the cat vomited. On physical exam, you note ptyalism and facial edema. The cat's mucous membranes are pale and slightly icteric. You perform a blood smear and detect Heinz bodies in erythrocytes. The cat's packed cell volume (PCV) is 26%. The owners provide you a list of the medications in the medicine cabinet which are acetaminophen (Tylenol), finasteride (Propecia), enalapril (Vasotec), and omeprazole (Prilosec). What treatments should you institute for this cat?

- Acetylcysteine and S-adenosylmethionine
- Prednisone and amoxicillin
- Activated charcoal and whole blood transfusion
- Emesis and methylene blue

Explanation - Acetaminophen toxicity in cats usually occurs when owners administer the drug, unaware of its significant potential toxicity in cats. In this case, the cat's clinical signs are most consistent with acetaminophen toxicity based on the Heinz body anemia that is present. Cats can die from oxidative damage and methemoglobinemia within 1-2 days of ingestion. It may also be associated with hepatotoxicity in cats, although this is seen more frequently in dogs.

Recall that cats are particularly sensitive to acetaminophen because they have decreased glucuronyl transferase activity which conjugates acetaminophen to glucuronic acid for excretion. As a result, 50-60 mg (a single tablet) may be fatal for a 4-5 kg cat.

Treatment should consist of toxin removal if possible by inducing emesis in some cases. As the cat in this case is already vomiting, this may not be necessary. Activated charcoal is controversial and should only be given if ingestion occurred within hours and should be administered very carefully in cats due to the risk of aspiration.

The specific antidote is acetylcysteine which binds to some of the reactive metabolites of

acetaminophen and increases the availability and synthesis of glutathione. Other treatments may include S-Adenosylmethionine (SAMe) which has hepatoprotective and antioxidant properties. Cimetidine can be given to inhibit the p450 oxidase in the liver and limit formation of toxic metabolites. Ascorbic acid can also be used as an adjunct treatment to bind toxic metabolites. In cats with signs of hypoxemia from severe hemolytic anemia (PCV <20%), a transfusion and further supportive care may be warranted.

Question

A 7-month old FS domestic short hair named Lilly presents after the owner found her eating a box of D-Con in the garage 20 minutes ago. She is unsure how much of the product Lilly ingested but about half of the box is gone. The box shows the active ingredient to be brodifacoum. Physical exam is within normal limits. You attempt to induce emesis using Xylazine but the cat does not vomit and just becomes sedate. Which of the following treatments are appropriate?

- Gastric lavage, activated charcoal, vitamin D daily for 14 days
- Activated charcoal, vitamin K daily for 14 days, 1 unit fresh frozen plasma
- Gastric lavage, activated charcoal, vitamin K daily for 30 days
- Gastric lavage, activated charcoal, 1 unit of fresh whole blood
- Activated charcoal, vitamin K daily for 14 days

Explanation - Because this cat has likely ingested a large amount of this toxin and presents to your clinic right away, decontamination should be performed via gastric lavage.
After lavage, activated charcoal should be administered.

This rodenticide inhibits epoxide reductase resulting in a loss of active Vitamin K. The overall effect is decreased synthesis of the Vitamin K-dependent coagulation factors: II, VII, IX, and X. Clinical signs occur after 3-5 days and hemorrhaging is the result. Therefore, since known ingestion has occurred, this cat should be started on oral Vitamin K supplementation daily for 30 days to account for the long half-life of brodifacoum in the body. A pro-thrombin time (PT) should be checked 48 hours after the last dose of Vitamin K.

Blood products are not indicated for this patient. Blood products are only necessary when there is already active bleeding occurring.
