THE ART OF TRIAGE
FOR VETERINARY RECEPTIONISTS

VCA NWVS Emergency and Critical Care Service

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TRIAGE: THE MAIN CONCEPTS …

• Trauma is one of the leading causes of death in cats and dogs.

• A coordinated team which responds rapidly, communicates clearly, and has knowledge in the field can save lives.

“Triage” = to sort

• System which classifies patients according to urgency for emergency care.

• The goal is to rapidly identify and treat life-threatening problems.

• Patients with life-threatening problems are treated without delay; stable patients must wait to be treated.

• Triage is typically performed by a triage nurse first, then a doctor once the patient is in hospital – but the reception team also plays a key role in being the “first responders” on both the initial phone call and when the patient comes in the door. Receptionists should learn a few key physiologic terms; they should be able to recognize that clinical signs such as pale mucous membranes, dyspnea, altered mental status and uncontrolled hemorrhage should prompt rapid evaluation!

• Triage is achieved by a primary survey based on the ABC (and D,E) approach, followed by a secondary survey.

• Three main body systems are assessed during the triage: respiratory, cardiovascular and neurologic.

• A “ready area” must be prepared and set up with appropriate supplies and equipment. This is essential to allow stabilization of the critical patient. The ready area should have immediate access to all materials needed for resuscitation and primary survey. An oxygen set-up, venous access supplies, IV fluids, IV hetastarch, a well-stocked crash cart, bare-hugger and key monitoring equipment (Doppler, ECG, pulse oximeter) are essential. As the “first line” on the phone it is essential that all parts of the team - the front desk, technicians and doctors – communicate the details of a possible in-coming emergency.

• Triage is a continual process: you must continually re-evaluate your patient, regardless of whether that patient is back in the ICU or waiting in reception.

• As part of the triage team, it is essential that receptionists learn a few key medical terms and some key physical parameters to ensure that cases are triaged in an appropriate way from the initial phone call right through to the completion of medical treatment.

Tier system in Veterinary Medicine

Category 1: Obvious emergency! Examples include cardiopulmonary arrest, massive blood loss, loss of consciousness, major trauma with hypotension, GDV, heat stroke, continuous seizures

Category 2: Strong potential for emergency. Examples include acute dyspnea, acute abdominal pain, heat exhaustion, any severe pain, significant trauma
**Category 3:** Potential emergency. Examples include abdominal pain, acute back pain or posterior paresis, serious extremity injury, large lacerations, cellulitis/abscess

**Category 4:** Non-emergent. Examples include mild malaise, lumps/ bumps, medication refill, mild URI, minor lacerations

**Communication, calm demeanor, confidence and direction …**

911 call!

1. Be calm! You are the first line of contact and if you display stress or anxiety during the conversation the client will pick up on this.

2. Focus on attaining necessary information about the emergency case while being supportive and helpful to the client. Ask the client if they need directions or any transport tips (carrier, towel etc). Pets should always be transported in carriers when possible.

3. Be confident in your interaction. Many emergency situations create extreme stress in clients. Emergencies are unexpected therefore they can't be planned for. The stress created by this can cause the client to transfer this onto their pet, and this may lead them to make poor decisions when preparing to transport the pet. A knowledgeable, confident and calm voice can be a huge support to guide the clients in these situations.

4. Express empathy. Put yourself in the clients shoes and think how you would feel if you were dealing with this. This might be your 3rd UO cat of the day, but for that client they may have never seen or heard of this problem and are simply worried about their pet.

   • **COMMUNICATION IS A CORE CLINICAL SKILL**

   • **COMMUNICATION IS A SERIES OF SKILLS THAT CAN BE BOTH LEARNED AND RETAINED**

**FRANK: “EFFECTIVE COMMUNICATION”**

A patient-centered approach that promotes a collaborative partnership between the patient/client and medical team. The goal is to increase accuracy, efficiency and supportiveness. The aim of communication becomes the establishment of mutually understood common ground.

**Key FRANK skills:**

- Listen! Ensure that it is an interaction rather than a direct transmission process. View communication as an interactive process.

- Be dynamic! Not every situation is the same. What may be appropriate for one situation is not always appropriate for another.

- Just imparting information or just listening is not enough. Giving and receiving feedback about the impact of the message is essential.

- Focus on asking open-ended questions along with close-ended questions. Focus on the clients perspective. Examples of open ended questions include “How can I help you?”; “How are you doing?” and “What problems brought you to the hospital today?” Closed ended question's include “ What kind of food does does
Jasper eat?”; “Does Jasper live indoors?” Often in triage close-ended questions are important initially to gain information quickly and to start the process of transport or treatment, but a combination of both types is important in relationship-centered communication. And, open-ended questions have been shown to actually take less time and give more complete information (vs several close-ended questions) in several studies!

- Chunk and check; Medical terminology and dealing with emergency information can be overwhelming. If you have given the client directions or other information, check in with them to see if they understood it.

- Express empathy. Put yourself in the clients shoes. It is also okay to acknowledge a client if they tell you things they’ve been through in the past. For example; “I lost my other dog Betty 6 months ago and my husband is also sick” or “I am very concerned about anesthesia as I once lost a dog during surgery”

**Good “Telephone Triage” Questions:**

- What is the pet’s age, breed, sex?
- What is your main concern with ……?
- Any known trauma?
- Was your pet indoors?
- How is the animal breathing? Any respiratory difficulty? Increased resp. rate or effort?
- What color are the gums? Is there any bleeding?
- What is the level of consciousness? Is the pet responding normally to you?
- Severe vomiting, diarrhea, seizures?
- Is the animal able to walk? Any obvious wounds or fractures?
- Do you have a safe way to transport your pet?
- Do you have clear directions to the hospital?
- Is there any other information I can help you with prior to transport?

**Key Words to Recognize:**

- Difficulty breathing – open mouth breathing in a cat, excessive panting or respiratory noise in a dog
- Difficulty walking, “wobbily”, stumbling, not walking
- “Straining”, “vocalizing”
- “Excessive swallowing”
- Cold limbs
• Pale gums
• Green feces or diarrhea

Specific Syndromes:

1. Unproductive vomiting in a large breed dog … is this a GDV?
2. Depressed male cat … does he have a urinary blockage?
3. Known toxin exposure …
4. Dachshund down in the rear
5. Dog eating rat bait or antifreeze … but he seems fine?
6. Cat with open-mouth breathing … is this an asthma attack or congestive heart failure?
7. Young dog or puppy with profuse bloody diarrhea … is this HGE, parvo?

Common Pitfalls of Triage

1. Failure to recognize high-risk complaints. For example: “a large breed dog with non-productive vomiting”.
2. Failure to assess vital signs. For example: a high heart rate signals shock in a dog but cats can often be bradycardic with the same history.
3. Failure to reassess within 2 hours!!

What is normal? Canine and feline physical exam parameters.

Chart of Normal Values:

<table>
<thead>
<tr>
<th><strong>Capillary refill time</strong></th>
<th>Less than 1 second</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mucous membrane color</strong></td>
<td>Generally pink</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>100.5 to 102 degrees F</td>
</tr>
<tr>
<td><strong>Pulse rate at rest</strong></td>
<td>Dogs 80 -120 bpm</td>
</tr>
<tr>
<td></td>
<td>Cats 180-200 beats per minute</td>
</tr>
<tr>
<td><strong>Respiratory rate</strong></td>
<td>Dogs and cats 15-30 breaths per minute</td>
</tr>
<tr>
<td><strong>Hydration</strong></td>
<td>Pick up skin and release: skin should “snap back” within 1 second</td>
</tr>
</tbody>
</table>
• **Respiratory system:** A pet’s chest wall should expand in and out, easily and slowly while they are breathing. A normal respiratory rate for a dog or cat is between 15-30 breaths per minute. The abdominal wall should barely move while a pet is breathing normally. Signs of respiratory distress include an extended head or neck, loud or unusual airway sounds, elbows out to the side of the body when breathing, elevated respiratory rate (more than 60 breaths per minute when not panting), or little to no movement of chest wall when breathing.

• **Cardiovascular system:** A pet’s normal gum color should be pink and when their gums are pressed, their capillary refill time should be quick (1-2 seconds). White, lavender, grey, or blue mucous membranes are an indication that that a pet is not able to perfuse their body with blood adequately. Other indicators of a compromised cardiovascular system include poor or absent pulses and abnormal heart rates and rhythms. A femoral pulse can be felt inside the upper hind limb area (groin area) and a brachial pulse can be felt on the inside of the upper front limb. When listening to a pet’s heart with a stethoscope or feeling its pulse with your fingers, you should feel or hear a steady, regular beat. In addition to a weak or absent pulse, or a greatly decreased or elevated heart rate, an irregular heartbeat can indicate that a pet’s heart is not functioning properly.

PALPATION OF A FEMORAL PULSE:

![Femoral Pulse Location](image)

• **Temperature:** To take a rectal temperature, lubricate a digital thermometer with petroleum jelly and gently, slowly insert the thermometer in the rectum approximately 1-2 inches. Record the temperature when the thermometer beeps (within 2 minutes).

• **Nervous system:** When evaluating a pet’s nervous system, a handler should first evaluate if the pet seems alert, interactive, and “appropriate” for their surroundings. Changes in mental status include seizures, coma, tremors, mental dullness, stupor, restlessness, or hyper-excitability. If the nervous system is affected from the “neck down,” a pet may not be able to walk, they may have generalized weakness, or they may have weakness of a single limb.

• **Abdomen:** A quick evaluation of the abdomen includes a visual assessment as well as gentle palpation. The abdominal cavity extends from just behind the ribcage to before the hind limbs. Note any enlargement of this area: acute distension of this area could indicate a bloat/torsion of the stomach or abdominal bleeding. To detect discomfort, fluid accumulation or distension, the abdomen can be palpated by gently pressing your hands into the abdomen from the ribs back towards the hind limbs. Also feel the skin at this time and note any wounds or lacerations. Note any tenseness, resistance to palpation, or vocalization from the pet which can indicate pain secondary to abdominal trauma.

• **Skin/Integument:** Wounds are not always detected on the first quick visual assessment. Once the cardiovascular, respiratory, and nervous systems have been assessed, do a physical “laying-on of hands” from a pet’s nose to its toes. Feel for any fractures,
lacerations, discontinuities, “crackles” (indicates free air under the skin) as your run your hands over the pet's body.

- The skin is also a good organ system to use for assessment of your dog's hydration. Gently pick up the skin over the back and release it quickly: a well-hydrated animal should have skin that snaps back into position immediately. If the skin stays tented, even momentarily, this is an indication that your pet does not have adequate fluid in their system.

- **Eyes:** When assessing a pet's eyes, have the pet sit and look straight forward. The pupils should be equal in size and respond to light by becoming smaller. The whites of the eye (sclera) should have visible blood vessels but should not be diffusely yellow, red, or discolored. The eyes should be moist, clear, and free of debris. If a pet is squinting, excessively blinking, has unequal pupils, has blood evident around the pupil or in the sclera of the eye, or has a large amount of discharge from the eye, these are all potential emergencies and need to be addressed immediately.

**TRIAGE …**

**The primary survey: Questions to ask yourself**

**A: AIRWAY** – Is there a patent airway? Is the oral cavity/throat clear of obstructions? Is there a need for intubation? Oxygen?

**B: BREATHING** – Is the patient breathing? What is the character of the patient’s respirations? Is there need for supplemental oxygen? Can you hear breath sounds? What is the animal's posture (head and neck extended, abducted elbows)? Is subcutaneous emphysema present? What is the color of the mucous membranes?

Airway/Breathing: Patency of airway and adequacy of ventilation can be assessed by visualization, palpation and auscultation. Clinical signs that may indicate respiratory distress include absent chest wall motion, exaggerated ventilator effort, flaring of the nares, open mouth breathing, head and neck extension, and paradoxical breathing.

**C: CIRCULATION** – Is there a heart beat? What is the heart rate and rhythm? Can you feel an effective femoral or other distal arterial pulse? Is the patient in shock? Is there evidence of hemorrhage, a major arterial bleed, or a hemoabdomen? Are the mucous membranes pale?

The patient’s circulation is assessed by visualization, palpation and auscultation. Assessment of mucous membrane (MM) color is essential. White or pale MM typically indicate blood loss anemia or vasoconstriction while bright red mucous membranes are a result of vasodilation and are common with sepsis or hyperthermia. Another important assessment of circulation is direct cardiac auscultation while palpating a distal arterial pulse. A distal arterial pulse should normally feel full, regular and strong.

**D: DISABILITY/DYSFUNCTION (NEUROLOGIC)** – What is the patient’s level of consciousness? Is the animal bright, alert, responsive, obtunded or comatose? Are the pupils dilated, constricted, of equal size and responsive to light? What is their posture and response to pain? Is the animal's mentation depressed? Is there any seizure activity? Is the animal ambulatory?

**E: RAPID WHOLE BODY EXAM** – Perform a rapid whole body exam looking for wounds, lacerations, punctures, bruises, fractures, abdominal pain/distension and any other signs of debilitation.
Shock

Definition: Shock is the condition where there is a lack of adequate blood volume to perfuse the body’s tissues. As a result, there is a failure of multiple organ systems of the body.

Examples of scenarios which can result in shock:

Blunt trauma: (i.e., hit-by-car (HBC), fall from height)

Penetrating trauma: (i.e. gunshot, knife wound, stick impalement)

Poison/toxin ingestion

Hyperthermia

Hypothermia

Envenomation

Submersion (near-drowning)

Bloat (gastric dilatation-volvulus)

Massive infection

Symptoms of shock:

- Gums are a very pale pink, gray, or white.
- The heart rate is very high or very low (i.e., over 180 or less than 60). Cats in shock often have a low heart rate.
- The respiratory rate is very high (i.e., greater than 30 breaths per minute) or breathing is very slow and labored.
- The pet is having difficulty breathing (i.e., extended head and neck, open mouth breathing).
- Pulses may be very weak (“thready”) or may be absent. The pulse rate is very high (150-200 beats per minute in a dog).
- The pet is mentally “inappropriate” and showing signs of restlessness, confusion, stupor, does not recognize its handler, or is generally very weak and depressed.
- On palpation, the limbs feel cool in comparison with other parts of the pet’s body.

Clinical signs of advanced shock include unresponsiveness, white gums, dilated pupils, rectal temperature below 98 degrees F, absent pulses with a very low or very high heart rate.

First Aid for Shock:

- Work swiftly towards getting a pet in shock transported safely to a veterinary hospital ASAP.
- Perform serial assessments of the “ABCs” (Airway, Breathing, Circulation) as well as determine the pet’s level of consciousness.
• Control all evidence of external bleeding. Slightly lifting a pet’s limbs can aid gravity in getting blood flow back to the brain.
• If oxygen is available and the pet is having trouble breathing, an oxygen mask can be gently applied to the face. If the pet will not tolerate the mask, flow-by oxygen can be provided by placing the end of the oxygen tubing near the nose.
• Assess body temperature and treat appropriately. Pets that are cold can be gently wrapped in blankets. Warm water bottles wrapped in towels can be placed around them but be careful not to have direct contact between heat source and skin. Pets that are hyperthermic can have cool water and cool water bottles applied to the skin of their limbs, chest, and abdomen.
• Keep the pet calm and quiet to prevent further blood loss or injury. If possible, have someone with the pet at all times to continue to assess its medical status.

**CATS:** Remember that the clinical signs of shock may be difficult to recognize in cats! Tachycardia is not always seen in cats. Cats may be bradycardic, tachycardic or normal. Cats in traumatic shock should be cautiously fluid resuscitated until signs of shock have abated. After initial assessment, many cats in shock are hypothermic and external re-warming and the use of warm fluids is a good idea.

**The secondary survey**

Once the primary survey is complete and appropriate emergency therapy is instituted, a secondary survey is performed. This includes performing a full, detailed physical exam, achieving basic monitoring, and obtaining baseline lab values.

1. Set up monitors: Doppler BP, ECG, SPO2, etc.
2. Obtain baseline labs: Istat, CBC, Chemistry panel, lactate +/- coags. If concerned with blood loss, monitor PCV/TS (focusing on TS) – recheck multiple times in first 1-2 hours.
3. Control pain: Pain increases an animal’s stress response and will put more pressure on an already stressed cardiovascular system.
4. Close evaluation of systems:
   c) Thorax: Radiographs? TFAST? Thoracocentesis? Flail chest?
   e) Integument: Laceration, punctures, abrasions, penetration into chest/abdomen?
   f) EENT (ears, eyes, nose, throat)

“**Ready Area” check list**

**General:** Gurney, small/medium and large backboards
CPR: Crash cart with defibrillator and endotracheal tubes of various sizes, a laryngoscope and assorted syringes and blades, key emergency drugs.

Oxygen administration: Oxygen source, ambu bag or breathing circuit that allows manual ventilation, infant/pediatric and adult cone masks, +/- PEEP valves and mechanical ventilator

Fluid resuscitation: IV catheters of various sizes, syringes, replacement fluids (Normosol-R, Saline, LRS), Hetastarch, blood collection tubes

Miscellaneous: Doppler blood flow detector and BP cuffs, suction unit, warming device (water circulating heating pad or warm air flowing device), clippers, portable US unit

Wound management: Sterile towels to pack wounds, wet saline dressings/surgical scrub, other dressing materials, vetwrap, splints

Emergency surgical procedures kits: Emergency tracheostomy kit, emergency chest tube/surgical pack for CPR or chest tube placement, vascular cut-down tray, emergency thoracocentesis and abdominocentesis supplies, surgical gloves in a variety of sizes

Common Veterinary Emergencies Requiring “Immediate Triage”:

1. Hit by car – shock, severe blood loss, fractures
2. GDV
3. Blocked cats
4. Respiratory emergencies
5. Saddle thrombus (cat dragging hind legs)
6. Ocular emergencies
7. Seizures
8. Anaphylaxis (especially after a bee sting or vaccines!)
9. Toxicities – the safest thing is for every potential toxicity to be evaluated by a veterinarian
10. Snake envenomation
11. Environmental emergencies: heatstroke, hypothermia. Especially hyperthermia in brachycephalic breeds (bulldogs, boston terriers, boxers, pugs…)
12. Electrocution
13. Feline asthma attack
14. Smoke inhalation
15. Severe big dog-little dog bite wounds
CASE DISCUSSIONS:

1. GDV Doberman – “Wrangler was fine last night. This morning he won’t eat is breakfast and is retching but can’t seem to bring anything up”

2. UO Cat - “Sam seems anxious, won’t settle down and is vocalizing”

3. Anaphylaxis - “Fred just had vaccines and now he seems really lethargic”

4. Toxicity - “My dog might have eaten rat bait but he seems fine....”

5. HBC Labrador – “I saw my dog get hit by a car but now he’s walking and seems ok”

ADDENDUM - good info to know!

1. Basic Pet CPR

2. 10 Top Toxicities

3. Tips from NWVS veterinary technicians

BASIC PET CPR

CPCR: Cardiopulmonary Cerebral Resuscitation

In December 2005, new guidelines were issued by the American Heart Association for cardiopulmonary cerebral resuscitation (CPCR) in humans—based on a review of current science and with regard to worldwide evidence-based resuscitation practice. These new recommendations show a greater emphasis on avoiding excessive ventilation rates and the importance of continuous, uninterrupted chest compressions.

Airway and Breathing:

- Make certain a patient airway is established. Extend the patient’s head and neck gently and pull the tongue forward: open the mouth and check both visually and manually for any debris that might be obstructing the airway.
- Listen, look, and feel for any signs of breathing. If no movement of air is detected, place your hands around the muzzle and give two forceful breaths 1-2 seconds in duration. Evaluate for spontaneous breathing.
- If the animal is still not breathing on its own, begin breathing at a rate of 10-12 breaths per minute. A visual rise in the chest wall followed by a normal relaxation should be seen. (Note: Prior recommendations of administering a higher ventilation rate of 20-24 breaths per minute showed that excessive ventilation decreased coronary perfusion pressure and decreased the success rate of CPCR.)

Circulation and Chest Compressions:
• Using a stethoscope, listen to the chest for heart sounds and feel for a pulse. If heart sounds and pulses are absent, begin continuous external chest compressions.

• Place the dog on a firm surface so it is lying on its right side. For medium to large dogs, the chest compressor’s hands should be placed over the widest area of the chest. One hand should be placed over the other in a parallel position; even pressure to the chest wall should be applied with the palm of the hand.

• Chest compressions should be performed at 80-100 compressions a minute with compression time equaling relaxation time. After being compressed approximately 30% of the chest wall diameter, the chest wall should be allowed to completely recoil.

• Chest compressions should be continuous with no pauses during administration of ventilatory breaths.

If the patient is not responding and you are within an hour of a veterinary hospital, continue CPCR in transit. Advanced Cardiac Life Support (ACLS) involving drugs, electrical defibrillation, and placement of an advanced airway are measures that should be undertaken only by those with veterinary medical training.

If the patient responds to CPCR, transport them as soon as possible to a veterinary facility to address the underlying problem that triggered the cardiopulmonary arrest (CPA) as well as to monitor for complications from CPCR (i.e., sepsis, reperfusion injury) and for recurrence of CPA.

**CPR GUIDELINES:**

The large majority (60-70%) of arrests are ventilatory, not circulatory, in small animals. Respiratory arrests and vagally mediated arrests are much more common than cardiac arrests in our patients. Most cardiac arrests in small animals result from conditions that are not primarily cardiac in origin such as anesthesia, metabolic compromise.

1) It is **critical** to establish an airway as quickly as possible. Ventilate the patient at a rate of 10-12 breaths per minute; each ventilation should produce a visible chest rise for one full second.

2) Compress the patient’s chest at a rate of 80-100 times per minute; allow the chest to completely recoil between compressions.

   *Lack of circulation for 10 seconds results in oxygen deficiency to the brain!*

   DO NOT interrupt chest compressions for more than 10 SECONDS every 2 minutes.

3) The most important factor for an arrest patient’s survival is the time from arrest to initiation of CPR

**TOP TEN TOXIN LIST**
**Metaldehyde (Slug Bait/Snail Bait)**

Metaldehyde is a common active ingredient in slug and snail bait products. These baits are often pelleted and sweet-tasting which make them appetizing to dogs as well as slugs and snails. A very small amount of metaldehyde, less than a teaspoon per 10 pounds of body weight, can cause poisoning in dogs. Metaldehyde affects the brain and clinical signs can occur rapidly – often within one hour of ingestion. Clinical signs can include vomiting, drooling, tremors, diarrhea, high temperature, elevated heart rate, and convulsions. Symptoms can progress to blindness, liver failure, and even death. There is no specific test for metaldehyde toxicity and the diagnosis is made based on possible exposure to slug bait combined with the characteristic twitching appearance of the patient. The veterinarian’s treatment goals are to remove any remaining slug bait from the patient in addition to controlling clinical signs. The uncontrollable muscle twitches raise the body temperature which in turn damages the brain; injectable muscle relaxants and sedatives are given to try to control the twitching. The prognosis is typically good with early and aggressive treatment. After acute clinical signs have been controlled, treatment is aimed at minimizing possible liver damage. This scenario can be avoided altogether if non-toxic alternatives to metaldehyde are used. Some alternatives include beer or yeast placed in slug traps, copper bars or crushed eggshells placed around plants, and iron phosphate pellets found under commercial name such as “Worry-Free,” “Sluggo,” and “Escargot.”

**Ethylene Glycol / Antifreeze**

Ethylene Glycol poisoning is the second most common cause of fatal poisoning in animals according to the American Association of Poison Control Centers. Although there is a very high potential for lethal results, patients lives can be saved by early recognition of exposure and quick administration of an antidote. Ethylene Glycol is a colorless, odorless, sweet tasting liquid used primarily as an antifreeze and windshield de-icing agent. Antifreeze in small doses can cause severe damage: approximately 3 tablespoons can be lethal to a 10 kg dog. The most profound consequence of ethylene glycol poisoning is acute kidney failure. Antifreeze poisoning can cause acid-base imbalances, central nervous system dysfunction and gastrointestinal irritation which result in vomiting, nausea, and weakness. Pets who drink antifreeze can appear intoxicated. A diagnosis can be made by analyzing a blood sample either using an in-veterinary clinic kit or by sending out testing to a local human hospital. Ethylene glycol is rapidly metabolized and is not detectable in serum or urine 48 to 72 hours after ingestion. In order for treatment to be effective, antidotes must be administered before toxic by-products of antifreeze are produced by the liver (usually within 8 hours of antifreeze ingestion). In addition to receiving an antidote, animals who have ingested ethylene glycol benefit from supportive care including IV fluids and medication to protect the gastrointestinal tract and the kidneys. Once the kidneys are affected or the patient produces little or no urine, the prognosis for recovery from ethylene glycol toxicity becomes poor. In these patients, some forms of dialysis (long term and expensive therapy) can sometimes offer a chance for recovery.
**Pyrethrins/Insecticides**

Pyrethrins are the most common chemical insecticide used to kill fleas. The most common source of pyrethrin toxicity is through spot-on products, although a variety of sprays, shampoos, dips and mousses are available. Many pyrethrin products are readily available through grocery, discount or pet stores. The toxic doses for pyrethrin and pyrethroid compounds are essentially unknown in dogs and cats. The consumer misuse of flea products placed on cats that are labeled “for use on dogs-only” accounts for a large portion of the cases which present with tremors, twitching and drooling. Owners of pets who are showing these symptoms after a flea product has been applied should bathe the patient with dish soap (i.e., Dawn) to remove the product from the skin. The patient should then be wrapped in a warm towel or blanket and brought to a veterinary hospital for further treatment. Typical treatment includes IV fluids, muscle relaxants, sedation, and supportive care. Very severe cases are often monitored for 24 hours and may require moderate to advance levels of nursing care and medical intervention to control seizures. Owners should always bring the flea product packaging to the veterinary office with the pet when they suspect pyrethrin toxicity.

**Anticoagulant Rodenticides**

Historically, the most popular chemicals used to control rodent populations have been “anticoagulants”. These toxins cause the body to lose its ability to clot normally, and in three to five days, a rodent will die of internal bleeding. Typical active ingredients in anticoagulant rodenticides include brodifacoum, bromadiolone, chlorophacinone, coumafuryl, difethialone, pindone and warfarin. Clinical signs of anticoagulant rodenticide toxicity include loss of color in the mouth and gums, weakness, and bleeding from the mouth, nose, urogenital or intestinal tract; these symptoms often show up several days after a pet has ingested the poison. Owners should transport pets with suspected or known rodenticide ingestion to a veterinary hospital for treatment and bring any remaining packaging with them. If the rodenticide was ingested within a two to three hour time frame from presentation, vomiting is often induced. Activated charcoal is administered to absorb any remaining toxin in the gastrointestinal tract. The patient is started on vitamin K1 supplementation immediately and will be continued on this medication for an average of 3-4 weeks. This is necessary to replace the vitamin K1 that the pet’s body is unable to make due to interference by the rodenticide. Clotting tests should be rechecked two days after vitamin K therapy has been discontinued to make sure that all the effects of the rodenticide have been eliminated from the pet’s system. Left untreated, pets with anticoagulant rodenticide ingestion will hemorrhage from virtually any site. Patients where treatment has been delayed may require hospitalization with IV fluid support and may also require blood transfusion.

**Antidepressants/Serotonin Syndrome**

With an increasing number of people being prescribed antidepressants (especially in our rainy Pacific Northwest!), an increasing number of pets are accidentally ingesting this medication.
“Serotonin Syndrome” is a disorder that can be caused by the ingestion of these drugs or combinations of drugs which increase serotonin availability. Just a few of the drugs which fall into these categories are the tricyclic antidepressants such as amitryptiline and clomipramine as well as amphetamines, cocaine, buspirone, fentanyl, meperidine, and dextromethorphan. Serotonin Syndrome can develop after therapeutic use, overdose, or when two or more drugs which increase serotonin availability by different mechanisms are used simultaneously. The clinical signs that result from over-stimulation of serotonin receptors include mental status changes (i.e., confusion, incoordination) in addition to vomiting, difficulty breathing, drooling, seizures, arrhythmias, and tremors. Clinical signs can appear within minutes of ingestion and can progress to coma and death within a few hours. No specific test can confirm Serotonin Syndrome and there is no specific antidote. Standard recommendations for supportive treatment include: basic decontamination of the gastrointestinal tract by inducing vomiting and administering activated charcoal; administering fluids to support blood pressure and blood flow to the kidneys; and administering barbiturates or valium for symptomatic care of seizures. Cyproheptadine, an antihistamine which possesses nonspecific serotonin antagonistic properties, has been used with success in human patients. The prognosis for recovery from Serotonin Syndrome depends on the overall health of the pet and the amount of medication ingested; animals typically respond with early and aggressive therapy.

**Raisins / Grapes**

Raisins, fresh grapes and grape pressings left over from wine-making have been shown as the cause in canine kidney failure in reports made to the National Animal Poison Control Center (NAPCC) over the past decade. Problems have occurred from dogs ingesting from 0.1 ounce per kilogram of body weight to 8 ounces per kilogram, showing a potential for a dog getting big trouble from eating very little. Both the toxic mechanism and the toxic dose are unknown. Some dogs may be unaffected after exposure, some dogs may be affected by a few grapes other dogs may eat large quantities with no signs. Within the first 6 hours of ingestion, clinical signs relating to gastrointestinal upset occur such as vomiting, diarrhea, and abdominal pain. The diagnosis is made through history of exposure, clinical signs and bloodwork. There is no specific test available for grape toxicity. Within one to three days of eating the grape products, over half of the prior case reports showed evidence of kidney failure. There is no specific antidote for grape or raisin toxicity and symptomatic and supportive care is recommended. Treatment involves eliminating from the dog’s body any remaining grape product followed by 2 to 3 days of intensive care with IV fluids. Medications to protect the pet’s gastrointestinal tract and kidneys are also recommended. If early and aggressive treatment is given, pets will often make a full recovery.

**Xylitol**

Xylitol is a sugar substitute closely related to sorbitol and mannitol. Xylitol is incorporated into candies, baked goods, puddings, oral and nasal rinses, toothpastes, and most prominently, sugar-free gum. Xylitol’s only known toxic effect on human consumption is that of a laxative when ingested in high doses; dogs ingesting a large amount can show low blood sugar, clotting disorders, and liver failure. A large release of insulin is the established cause of the
hypoglycemia; the exact mechanism for xylitol’s induction of liver damage is unknown. Hypoglycemia has been seen to occur at doses around 0.2 grams per kg and hepatic necrosis at 1.6 grams per kg. Difficulty arises trying to determine the exact amount of xylitol in a product as many companies, most notably chewing gum manufacturers, do not divulge the amount of their ingredients in their secret recipes. Due to the varied and unknown amounts of xylitol in chewing gums, two to three sticks consumed by a 10 kg dog can be considered a toxic ingestion. As for other products where the amount of xylitol is listed on the label, any ingestion greater than 0.1 gram/kg should be seen and treated. There is no antidote for xylitol toxicosis. Treatment for xylitol ingestion includes eliminating the remaining source of xylitol from an animal’s system, placing and animal on IV fluids with dextrose and frequently monitoring blood glucose levels, clotting tests and liver function tests. Medications which protect the gastrointestinal tract and support liver function are also indicated. If liver values are normal or near normal at 72 hours post –treatment, then prognosis is fair to good for a full recovery.

**Acetaminophen / Ibuprofen**

Aspirin, acetaminophen, ibuprofen are great pain relievers for people, but can cause serious health problems if given to cats and dogs. Stomach ulcers, liver and kidney failure, and even death can occur if you give these medications—even in very small amounts—to your pets (especially cats). NSAIDS such as ibuprofen and naproxen are very good for decreasing inflammation and very bad for the stomach lining and renal blood flow. Acetaminophen can cause damage to the liver and red blood cells from one single overdose or from repeated doses. Cats are especially sensitive to acetaminophen as their livers are lacking in an enzyme that helps to metabolize this drug. Symptoms of NSAID and acetaminophen toxicosis include vomiting, depression, diarrhea, incoordination, bloody stool, panting, increased thirst and urination, facial or paw swelling (acetaminophen), blue or brown gums, elevated heart rate, seizures, low blood pressure and even death. Diagnosis is made based on exposure history combined with presence of associated clinical signs. While there are medications that help the liver metabolize acetaminophen, there are no specific antidotes for either acetaminophen or ibuprofen toxicosis. Symptomatic and supportive treatment for both toxicities includes gastrointestinal decontamination by inducing vomiting and administering activated charcoal. IV fluids are administered to control blood pressure, increase elimination of the toxin and to maintain kidney function. When acetaminophen toxicity is diagnosed, medications are given which help replenish liver enzymes, prevent and treat liver damage and decrease the damage to red blood cells. With NSAID toxicity, medications are administered to protect the gastrointestinal tract and to prevent and treat ulcers. If significant bleeding has occurred due to large amount of NSAID ingestion, blood transfusions may be indicated. As with many other toxicities, early and aggressive treatment usually results in a full recovery for pets that have ingested OTC human pain relievers.

(*Unless directly advised by your veterinarian, NEVER give any over-the-counter or herbal medications marketed for human consumption to your pet. Knowing this one fact alone will substantially improve your animal’s chances of long and healthy life!)

**Plants**
Many household and garden plants are toxic to pets so it is a good idea to familiarize yourself with the plants that grow in your yard as well as those that are in the bouquet delivered to your door.

Lilies, Tulips, Daffodils, Castor Bean, Yew Tree, Monkshood, Delphinium, Rhododendron/Azalea, Oleander, Cyclamen, Ivy, Bleeding Heart, Autumn Crocus, Daphne, Foxglove, Hellebore, Allium, Holly, Lily of the Valley, Angel’s Trumpet, Hydrangea, Tobacco, Rhubarb, and the list goes on . . .

To find out whether or not a plant is toxic to companion animals, there are several good veterinary toxicology textbooks available. Another alternative is to refer to www.aspca.org (National Animal Poison Control Website); on this site is a list of toxic/non-toxic plants for small animals.

For the vast majority of plant intoxications, there are no specific antidotes and the adage “treat the patient and not the poison” is closely followed. General GI decontamination procedures including induction of vomiting and administration of activated charcoal should be started (when indicated). This initial step should be followed by providing supportive and symptomatic care (i.e., IV fluids, GI protectants, corticosteroids, analgesics, anti-arrhythmics, seizure control medication, antihistamines) as needed on a case-by-case basis.

To highlight one specific example, members of the lily family including Easter Lilies, day lilies, tiger lilies, and oriental and Asiatic lilies can cause kidney failure in cats. Eating as little as one leaf can be fatal to a cat, and all parts of the lily plant are toxic. In the first few hours after ingestion, vomiting and depression are seen followed shortly by shutdown of the kidneys. Quick initiation of treatment followed by at least two days of intensive care can often help the damaged kidney cells to regenerate. However, waiting to see a veterinarian and delaying care for more than 12 to 18 hours can result in permanent kidney damage and death of an animal.

**Chocolate and Caffeine**

Chocolate, caffeine stimulant tablets, headache medications, coffee and coffee beans, herbal medications containing guarana, cocoa powder, and cocoa bean mulch all contain stimulants called theobromine and caffeine. Depending on the amount an animal ingests, these chemicals affect the central nervous system, the heart, the kidneys, the musculoskeletal system and the gastrointestinal tract. Dogs do not metabolize and excrete theobromine as well as humans. Typical signs seen with chocolate or caffeine ingestion include restlessness, hyperactivity, vomiting and diarrhea, panting, excessive thirst and urination, tremors, seizures, an abnormal heart rhythm and even death. The diagnosis of chocolate or caffeine toxicity is most often made by the combination of compatible history and clinical signs. Supporting evidence can come from stomach contents (i.e., presence of chocolate in vomitus). There is no specific antidote for chocolate or caffeine toxicosis and treatment is symptomatic. It is important to prevent further absorption by inducing vomiting. IV fluids are administered to speed up elimination of toxic compounds and to treat dehydration from vomiting and diarrhea. Because the half-life of theobromine is long (17.5 hours in a dog!) and because chocolate tends to stay in a solid or semiplastic state in the stomach, repeated doses of activated charcoal should be administered.
Medications to treat seizures, tremors, irregular heart rates and rhythms are administered based on clinical signs. It can take up to 4 days for theobromine to clear a pet’s body.

(*The darker the chocolate, the higher the content of theobromine and thus the greater potential for serious problems in our pets. For example, it takes only two ounces of baking chocolate to cause a life-threatening problem in a 10 pound dog.)

Below is a chocolate toxicity table to use for reference; another option is to type into your computer’s search engine: “Chocolate Toxicity Calculator.” Several different sites will calculate the potential toxicity of your individual scenario after you enter your canine’s body weight in addition to the type of chocolate and amount of chocolate ingested.

<table>
<thead>
<tr>
<th>Number of OUNCES of CHOCOLATE a Pet Would Need to Ingest for TOXICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight of Pet in Pounds</strong></td>
</tr>
<tr>
<td>Milk Chocolate (ounces)</td>
</tr>
<tr>
<td>Dark Chocolate (ounces)</td>
</tr>
<tr>
<td>Baking Chocolate (ounces)</td>
</tr>
</tbody>
</table>

**Tricks and tips for clients from the veterinary technicians at VCA NWVS**

Beth Woodson, LVT (VTS E/CC)

- Cut a nail too short? To stop it from bleeding try cornstarch applied to the area and apply direct pressure for about five minutes.
- Avoid over the counter flea and tick products, especially for cats! Not only are they less effective than Advantage or Frontline they are dangerous and can cause adverse reactions such as tremors and seizures!
- Over the counter human medications are rarely safe for pets! Avoid administering any medications such as ibuprofen, acetaminophen or even aspirin to your pet! If you believe your pet is painful seek advice from your veterinarian or an emergency clinic before trying to treat it yourself!
- Need advice? Many people turn to the internet for advice on recognizing and treating various conditions for their pets. These sources are often unregulated and often not accurate. Try [www.petplace.com](http://www.petplace.com) for general information. It is maintained by veterinarians and has a wide range of reputable advice. For information on potential toxins or household hazards try National Animal Poison Control Center at 1-888-426-4435 or their website [www.aspca.org/pet-care/poison-control](http://www.aspca.org/pet-care/poison-control)
• Going out of town? Make sure your pet sitter or kennel has written permission to transport your pet to a veterinarian for treatment if necessary as well as information to contact you directly with questions. Leave a folder for the caretaker with your regular vet’s name and number as well as any information about your pet’s health history.

• Dog parks can be a blast but if you own a small or toy breed dog consider parks that offer separate play areas for these little guys. Even friendly play with a larger dog can result in serious injury to smaller breeds. For more information try www.portlandpooch.com; They have over 50 dog parks listed for the Portland/Vancouver area including park pictures, descriptions, water availability, small dog sections and fencing information.

• On hot summer days try offering ice cubes as a treat for your dog. Plastic children’s wading pools are another fun way for your dog to stay cool. Walk your dog early in the morning or later in the evening when temperatures drop to avoid overheating.

• Never offer high fat table scraps or bones to your pet or leave food waste in a pet accessible area. If you want to give your pet a special treat try small pieces of carrot or a small amount of canned unspiced pumpkin. Both are low fat and healthy treats.

• To clean your pet’s ears try a mixture of 50% white vinegar and 50% water. Clean the visible area (with a small amount of this solution) only with a cotton ball or makeup removal pad making sure not to enter the ear canal.

• Monitor your pet closely when offering new chew toys, rawhides or chew hooves. They may swallow large pieces that can become choking hazards or intestinal foreign bodies.

• If your pet suffers a laceration do not use tape, glue or any adhesive substance on the wound. Cover the wound with gauze or a light, non adhesive bandage and take him to your veterinarian.

• While recovering from any surgical procedure, make sure your pet wears an Elizabethan collar (cone collar) to prevent him or her from removing the sutures or opening the incision. Ask your vet for one before leaving the clinic or buy one at a pet store to have on hand.

• Spaying or neutering your pet can be costly. For spay/neuter coupons that cost as little as $30 to $70 go the Oregon Humane Society website www.oregonhumane.org and print a coupon for a veterinary facility in your area that honors them.

• Looking into alternate diet options for your pet? Try the AAFCO website (American Feed Control Officials) for certified pet food options. Not only does this organization review diet safety but they also approve foods for minimum maintenance and growth that meet veterinary nutritional standards. Many commercial pet foods are sold without meeting these standards, potentially endangering your pet.

• Looking for a new pet for your kids to play with? Consider a medium to large breed puppy or adult that already has some “kid time” under his or her belt. Supervise your child with the new pet closely and make sure he or she practices gentle handling of the new pet. Very small or very young animals are often too fragile for young children.

The technicians at VCA NWVS are happy to answer additional questions 24 hours a day, 365 days a year. Let us know if we can help! Phone 503 656 3999

REFERENCES:

2. Silverstein D, Hopper K. Small Animal Critical Care Medicine: 2009. Chapters 2, 6, 10
7. VCA NWVS Pet First Aid Book. Please call 503 656 3999 if you would like further copies of this first aid book for your clients.