

Common Medical Condition Treatment Methodologies

Contents

- Allergic Reaction 1
 - Non-Emergent 1
 - Potentially Emergent..... 1
 - Emergent 1
- Airway Emergencies 1
 - Complete Obstruction 1
 - Partial Obstruction 1
 - Apnea 2
- Breathing Emergencies 2
- Broken Toenail 2
- Cardiopulmonary Resuscitation (CPR) 2
- Circulation Emergencies 3
- Diarrhea 3
 - Non-Emergent 3
 - Potentially Emergent..... 4
- Ear Infections 4
- Foot Pad Injuries 4
- Fractures 4
- Gastric Dilation Volvulus (GDV) 5
- Hypoglycemia..... 5
- Hyperthermia 5
 - Mild 5
 - Moderate..... 5
 - Severe 6
- Hypothermia 6

Mild	6
Moderate.....	6
Severe.....	6
Major Lacerations	7
Minor Lacerations	7
Ophthalmologic Conditions	7
Non-Emergent.....	7
Potentially Emergent.....	8
Vomiting.....	8
Non-Emergent.....	8
Potentially Emergent.....	8
Seizures	8
Skin Infections.....	9
Toxic Injury.....	9
Urinary Tract Infections (UTI)	10

Allergic Reaction

Non-Emergent

The treatment option for non-emergent allergic reactions available in the cache includes:

- Dexamethasone: 0.1 milligrams/kilogram (mg/kg) Intramuscular (IM)
or
- Prednisone: 0.25–0.5 mg/kg orally (PO)

Potentially Emergent

- Diphenhydramine: 1–4 mg/kg PO TID, 1-2 mg/kg IM (**Note:** IV administration of diphenhydramine can induce profound hypotension.)
- Dexamethasone: 0.1 mg/kg IM or Prednisone 0.25–0.5 mg/kg PO
- Epinephrine: 0.3–0.5 mg 1:1,000 subcutaneous (rarely needed)

Emergent

Treatment for anaphylactic shock:

- IV or Intraosseous (IO) catheter
- IV or IO fluids: 20 mL/kg bolus, repeat as needed
- Diphenhydramine: 1–2 mg/kg IM (**Note:** IV administration of diphenhydramine can induce profound hypotension)
- Dexamethasone: 0.1 mg/kg IV
- Epinephrine: 0.3–0.5 mg 1:1,000 SQ (rarely needed)
- Monitor

Airway Emergencies

Complete Obstruction

- Perform a finger sweep. **Do not put your fingers in the canine's mouth, use a leash or gauze to pry the mouth open and hold it open.**
- Perform the Heimlich maneuver.
- Perform a needle cricothyroidotomy. Be sure any supplemental oxygen is able to exit.

Partial Obstruction

- Open the airway by extending the head and neck and extending the tongue. **Do not put your fingers in the canine's mouth, use a leash or gauze to pry the mouth open and hold it open.**
- The head and neck should be in a neutral position with the dog in lateral recumbency if a suspicion of cervical spine injury exists.
- If an obstruction is due to allergy/inflammation, administer dexamethasone 0.1 mg/kg IM or IV.

Apnea

- Intubation: Can depress the back of the tongue with a laryngoscope. Use a tongue depressor to better visualize the larynx for intubation.
- Needle cricothyroidotomy: Be sure any supplemental oxygen is able to exit.

Breathing Emergencies

The treatment consists of:

- Treat the cardiovascular collapse by providing IV fluid.
- Decrease the intrathoracic pressure through a needle thoracostomy at the intercostal space between ribs 7 and 8 or 8 and 9. This space is identified by counting cranial from the last rib (13) toward the head.
- Administer artificial respirations, using one of the following methods:
 - Mouth to nose
 - Oral tracheal intubation
 - Needle cricothyrodomy
- Respirations should be delivered at a rate of 10-12 breaths/minute. There should be a visible chest rise, unless indication for hyperventilation. Monitor end-tidal CO₂ (ETCO₂) if available, and consider supplemental oxygen if possible.

Broken Toenail

- If broken near the base, it should be removed. Apply antibiotic ointment and bandage. Otherwise, trim or splint it and bandage.
- Silver nitrate cautery can be used for nail avulsions (stings), but pressure wrap may be sufficient.
- For pain management, use nonsteroidal anti-inflammatory (**use only canine-specific**). Cache choices vary from Deramaxx, Rimadyl, and Etogesic. They are dose-specific for each brand.

Cardiopulmonary Resuscitation (CPR)

Cardiac arrest in the dog is different in many ways than cardiac arrest in the adult human. As a rule, the Medical Specialist should apply principles from pediatrics rather than adults when dealing with cardiac arrest in dogs. The most common arrest rhythm is asystole rather than ventricular fibrillation. The most common cause of arrest is respiratory arrest rather than myocardial infarction – which is rare in the dog. During resuscitation, the dog may develop ventricular fibrillation, if so, then defibrillation is appropriate.

To perform CPR on a canine, both chest compressions and airway management are addressed:

- Chest compressions are performed with the dog in lateral recumbency, with both hands at the highest curvature of the chest. The optimal compression rate is 100/min. with a depth of compression to $\frac{1}{3}$ – $\frac{1}{2}$ of the chest volume.
- Airway management is still part of canine CPR due to incidence of respiratory arrest. There are several methods to provide artificial respirations. During CPR.
 - Give breaths at 10–12 breaths/min. and at 10 mL/kg or sufficient volume to cause a rise of the chest.
 - If attempting CPR alone, consider giving 2 ventilations for every 30 chest compressions.

Circulation Emergencies

Circulation emergencies are best handled through the control of hemorrhage and continued assessment of the canine while arranging transport for definitive veterinary care. It may also be necessary to perform CPR on the dog.

Control of Hemorrhage

Severe bleeding may be controlled through the use of direct pressure and hemostatic dressings. Tourniquets are not very effective due to the canine's anatomy.

Canine Assessment

Dogs with circulatory emergencies require continued assessment of the following:

- Femoral pulse rate and quality
- Mucous membrane color
- Capillary refill time
- Mental status
- Temperature

Treat with 0.9% normal saline fluid bolus IV or IO at 20–30 mL/kg, which is repeated every 15 minutes as indicated by the response to resuscitation. If signs are improving with normal saline bolus, then decrease the volume or rate of fluid administration, thus titrating the treatment to match the physiologic response. (**Note:** Typically the total fluid volume should not exceed 90 mL/kg/hr. for the first hour.)

Diarrhea

Non-Emergent

- Soft-formed to cow-pie diarrhea in a dog who is otherwise clinically normal may just need time, a bland diet, and some probiotics.
- Consider metronidazole (Flagyl) if diarrhea persists for more than 24 hours (10 mg/kg PO IBD for 5 days).

Potentially Emergent

- If the canine is not vomiting, can try oral electrolyte solution for rehydration.
- **If there are no signs of shock**, subcutaneous fluids (15–20 mL/kg) may provide rehydration.
- Administer metronidazole (Flagyl) 10 mg/kg PO BID for 5 days.
- Anti-diarrheals are potentially hazardous and should only be used upon consultation with a veterinarian.
- **If there are signs of shock**, administer IV fluids and transport.

Ear Infections

- Clean the ear with an antiseptic and drying agent.
- Topical therapy is preferred (antifungal, antibiotic, and sometimes anti-inflammatory).
- If the infection is severe, impairing balance or causing a head tilt, veterinary care is recommended.

Foot Pad Injuries

- For foreign bodies, remove, clean, and apply antibiotic ointment and a waterproof boot.
- Because of the weight and pressure placed on the paw pad, cuts and wound edges are spread. Sutures, staples, and glue will not hold and may cause further damage:
 - **Cleanse** and apply antibiotic ointment, padding stretch gauze, vet wrap, and Elastikon to protect. Change bandage as needed; some wounds may be left open to heal during rest after 2–3 days.
 - Can use silver sulfadiazine on foot pad lacerations and burns.

Fractures

Stabilizing fractures prior to treatment includes splinting and pain management:

- The joint above and below the fracture must be stabilized, therefore, only fractures below the knee (stifle) or below the elbow should be splinted.
- Splints for fractures can be made out of roll cotton (Robert Jones) or other splint material after sufficient padded bandaging is applied. **Note:** The bandage must always extend from the toes proximally. Ideally the toes should be barely visible to monitor for swelling.
- Forced immobilization may not be tolerated. If the dog struggles, pain control is the best approach.
- Pain control will be required. Administer morphine 0.5–2 mg/kg IM, SQ. (**Note:** Morphine may cause emesis and histamine release.)

Gastric Dilation Volvulus (GDV)

Treatment for GDV:

- Administer IV normal saline 20–30 mL/kg bolus and repeat as needed (often up to 90 mL/kg).
- Provide supplemental oxygen.
- Evacuate.
- Perform gastric decompression (only if GDV is contributing to respiratory distress or shock):
 - Fluid resuscitate
 - Two options: trocarization or stomach tube:
 - Trocarization:
 - Step 1: Clip and prep an area caudal to the 13th rib dorsally on the left side.
 - Step 2: Percuss for tympany (hollow air distended viscus). If not hollow, sounding could be spleen or stomach contents. **Do not trocarize.**
 - Percutaneously place an 18-gauge catheter into the stomach, remove the stylet, and allow decompression.
 - Surgical exploration is indicated.

Hypoglycemia

- Administer 50% dextrose PO.
- If the dog is unconscious, IV administration is preferred.
- Administer dextrose 10% in Water (D10W) 0.5–1 gm/kg IV.

Hyperthermia

Mild

- Stop activity or remove from hot environment.
- Immerse in cool water or spray with cool water and fan.
- Reduce body temp to 102°F (39.2°C) within 30–60 minutes.
- Increase air movement.
- Provide shade.
- Monitor for prolonged recovery and development of diarrhea.

Moderate

- Stop activity or remove the dog from the hot environment.
- Immerse the dog in cold water or spray with cold water.

- Stop active cooling at 103°F (39.4°C).
- Increase air movement.
- Provide shade.
- Monitor for prolonged recovery and development of diarrhea. If it occurs, place an IV catheter, start cold IV fluids, and evacuate.

Severe

Treatment for heat stroke includes:

- Remove the dog from the hot environment.
- Immerse the dog in cold water or spray it with cold water.
- Stop active cooling at 103°F (39.4°C).
- Increase air movement.
- Place an IV catheter and start cold IV fluids.
- Evacuate.

Hypothermia

Mild

- Drying the fur
- Moving out of the wind
- Mild exercise if able
- Warming food (if normally given wet food, dry food may be given)
- Wrap in warm blankets

Moderate

Treatment may be achieved by:

- Drying the fur
- Moving the dog out of the wind
- Performing mild exercise if able, otherwise wrapping in blankets
- Evaluating for hypovolemia and treating if present
- Initiating external rewarming, warmed air, or circulating water blankets

Severe

This may be achieved by:

- Drying the fur
- Moving the dog out of the wind
- Performing mild exercise, if able, otherwise wrapping in blankets
- Moving with great care
- Evaluating for hypovolemia and treating if present

- Initiating central rewarming along with warmed air and circulating water blankets
- Evacuating

Major Lacerations

- Irrigate the wound.
- Shaving hair is necessary:
 - Shave around the intact dressing first.
 - Remove the dressing.
 - Fill the wound with a sterile water-soluble lubricant.
 - Shave the wound margin.
 - Irrigate out remaining hair and lubricant.
- Staples can be used for temporary wound closure.
- Cover the wound with protective dressing.
- If viscera is exposed, cover with a moist protective dressing.
- For thoracic wounds, assess breathing and evidence of pneumothorax. Consider occlusive dressing.
- Pain control may be required. Administer morphine 0.5–2 mg/kg IM, SQ. (**Note:** Morphine may cause emesis and histamine release.)

Minor Lacerations

Treatment for minor lacerations includes:

- Irrigate and explore the wound for retained foreign bodies.
- Shaving hair is necessary to fully evaluate the extent of the wound and enhance healing:
 - Shave around the intact dressing first.
 - Remove the dressing.
 - Fill the wound with sterile water-soluble lubricant.
 - Shave wound margin.
 - Irrigate out remaining hair and lubricant.
- May use local anesthesia (2% lidocaine at no more than 0.22 mL/kg). Use the amount needed to inject subdermally around the laceration if suturing or stapling. Reduce the sting by adding sodium bicarbonate at a rate of 1:9.
- Staples, sutures, or skin glue can be used for wound closure. The method of closure will depend on the depth, length, and location of the wound.

Ophthalmologic Conditions

Non-Emergent

- Check under third eyelid and irrigate eye liberally with saline.

- Stain eye with fluorescein to evaluate for corneal ulcers.
- If ulcers are present, consult with veterinary support. Do not use ophthalmic steroids.
- Monitor for pain, tearing, squinting, and/or mucopurulent discharge.
- If the eye is painful, veterinary assessment is warranted.

Potentially Emergent

- Irrigate the eye liberally with saline.
- Stain the eye with fluorescein to evaluate for corneal ulcers.
- If ulcers are present, consult with veterinary support. **Do not use ophthalmic steroids.**
- Protect from self-trauma (Elizabethan collar) and evacuate.

Vomiting

Non-Emergent

To achieve this goal the treatment should follow the progression below, waiting several hours before moving to the next step:

- Give ice chips.
- If the dog is able to keep the ice chips down, follow with ice cubes.
- If ice cubes are successful, start oral liquids.
- If liquids are managed, begin a light and bland diet.
- If vomiting persists, monitor for dehydration. Veterinary consultation is recommended.

Potentially Emergent

- **If there are no signs of shock**, subcutaneous fluids (15–20 mL/kg) may provide rehydration.
- Anti-emetics such as Cerenia (1 mg/kg SQ daily) or ondansetron (0.5 mg/kg PO or slowly IV q 12 hours) are only recommended in cases in which intestinal obstruction is not a possibility.
- If vomiting persists for more than 12 hours then diagnostic assessment by a veterinarian is warranted.
- **If there are signs of shock**, administer IV fluids and transport.

Seizures

- Administer diazepam 0.25–0.5 mg/kg or IV, up to 5 mg/kg. (**Note:** There is a higher dose for canines compared to humans. This is due to the canine's rapid hepatic metabolism.)
- Administer midazolam 0.25–0.5 mg/kg IV or IM.
- Check blood glucose if possible.
- Dogs with first time seizures should have a full veterinary evaluation.
- Status epilepticus is a life-threatening emergency.

Skin Infections

- Clip the hair and clean the skin with an antiseptic and drying agent (chlorhexidine solution or acne wipes).
- Topical antibiotic treatment is preferred for minor skin infections. Topical steroid sprays or creams may also be applied. Discuss the side effects of steroid use with the handler.
- If systemic treatment is indicated to control itching, administer Prednisone (0.5 mg/kg BID 3 days, SID 3 days, EOD 3 days). For first line treatment of infection, administer cephalexin (20 mg/kg PO BID 14 days).
- Use an Elizabethan collar to prevent self-mutilation and keep the area dry.
- Consider systemic antibiotics like cephalexin and amoxicillin/clavulanate. However, if the infection is extensive or deep, a veterinary consultation is recommended.
- *Hot spots*, which are a superficial local dermatitis, are typically extremely pruritic. Prednisone is often administered along with antibiotics, clipping the hair, and cleansing. Topical antibiotic steroid sprays or creams are also applied. Discuss the side effects of steroid use with the handler.
- Dosing:
 - Prednisone: 0.5 mg/kg BID 3 days, SID 3 days, EOD 3 days
 - Cephalexin: 20 mg/kg PO BID 14 days

Toxic Injury

- Decontamination:
 - For inhaled toxins, remove the dog from the environment and provide fresh air and oxygen.
 - For topical toxins, irrigate the eyes and decontaminate the skin with a dry brush, Dawn detergent, or neutralizing agent.
 - For ingested toxins, induce emesis unless contraindicated. Administer activated charcoal (3 kg/kg PO) unless contraindicated.
- Induced emesis:
 - Administer 3% hydrogen peroxide, 1–2 mL/kg PO early (< 6 hours) post-ingestion.
 - Administer apomorphine tablets. Place the tablet in the conjunctive of the eye as soon as the dog begins to vomit and flush the tablet out with saline.
 - Contraindications to induced emesis are bradycardia, respiratory difficulty, abnormal mental status, lack of a gag reflex, known caustic agent or sharp object, and petroleum distillates.
- Consider pharmacology or toxicant and potential antidotes. Diuresis may be indicated.
- Consult with veterinary support or animal poison control.

Urinary Tract Infections (UTI)

For treatment of UTIs, refer to the article, “Antimicrobial Use Guidelines for Treatment of Urinary Tract Disease in Dogs and Cats: Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases”

(<http://www.hindawi.com/journals/vmi/2011/263768>).

- Treatment for UTIs includes:
 - Amoxicillin/Clavamox is the empiric antibiotic of choice that is available in the cache (dose: 10–20 mg/kg PO BID for 14 days).
 - Trimethoprim sulfa (Bactrim) is another antibiotic for UTIs although it has been associated with hematologic side effects and keratoconjunctivitis sicca (dry eye) in some dogs with prolonged therapy (dose: 15 mg/kg PO BID for 7 days).
 - Cephalosporins (cephalexin) does not address gram-negative bacteria, but for gram-positive infections administer 12–25 mg/kg PO BID.
- Increase water consumption if possible.