

K9 Medical Treatment Guidelines

Assessment Guidelines:

- 1) The K9 handler should possess the information including vital signs specific to their K9 partner.
- 2) Vital signs in the K9 are specific to breed and the specific K9.
- 3) Vital Sign Limits:
 - a. Pulse: Checked at the femoral artery, inside thigh in inguinal crease
 - i. Normal
 1. Rate at rest: 60-80bpm,
 2. Rate post exertion: no more than 130 bpm
 - ii. Abnormal
 1. <8 rpm or >40 rpm
 2. Short Shallow respiration
 3. Snorting, grunting, wheezing, stridor
 - b. Respirations
 - i. Normal
 1. Rate: 10-40rpm
 2. Tidal Volume (Vt): awake: 20ml/kg, asleep: 10-15ml/kg
 - ii. Abnormal
 1. <8 rpm or >40 rpm
 2. Short Shallow respiration
 3. Snorting, grunting, wheezing, stridor
 - c. Mucosal Membrane: checked at gums above tooth line.
 - i. Normal
 1. Moist
 2. Color consistent with norms for the patient
 - a. Pink is most common but may be pigmented based on breed of K9. These variations may make Mucosal Membranes difficult to assess.
 - ii. Abnormal
 1. Tacky / Dry
 2. Color
 - a. Brick Red
 - i. Infection, Co2 Poisoning, shock, sepsis, hyperthermia
 - b. Blue
 - i. Cyanosis
 - c. White
 - i. Shock
 - d. Yellow: Jaundice

- i. Hemolytic anemia
 - ii. liver disease/gallbladder disease
 - e. Grey
 - i. Shock,
 - ii. perfusion issues; ie gastric torsion and cardiac disease
- d. Capillary Refill
 - i. Normal
 - 1. < 2 seconds
 - ii. Abnormal
 - 1. > 2 seconds
- e. Temperature: Rectal
 - i. At rest: 100-102.5 F
 - ii. Post activity: 103-105 F
 - 1. Should return to normal after 10-20mins
- f. Eyes
 - i. Normal
 - 1. PERRL
 - 2. Color based off of patient's normal
 - ii. Abnormal
 - 1. Nystagmus: shacking of eyes side to side, up and down or rotary
 - a. Neurological issue / toxins
 - 2. Non-reactive
 - a. Neurological issue / toxins / head trauma
 - 3. Slow Papillary response
 - a. Neurological issue / toxins / head trauma
 - 4. Dilated or Pinpoint
 - a. toxins / head trauma
- g. Urine
 - i. Color
 - 1. Normal
 - a. Based on patient's normal
 - b. Clear in color or light yellow
 - c. No odor
 - 2. Abnormal
 - a. Dark yellow
 - i. dehydration
 - b. Red / brown red
 - i. Hematuria

- ii. Bilirubinuria
- iii. Myoglobinuria Urea
- iv. Hemoglobin uria

ii. Frequency

1. Normal

- a. Based on patient's normal
- b. Three to four per day

2. Abnormal

a. Decreased

- i. Secondary to illness
- ii. Toxin

b. Increased

- i. Toxin
- ii. Kidney disease / damage
- iii. Dehydration

c. Leaking

- i. Marijuana ingestion

h. Feces

i. Color

1. Normal

- a. Based on patients normal
- b. properly formed stool

2. Abnormal

- a. soft stool
- b. Diarrhea (liquid or any variation)

ii. Odor

1. Normal

- a. Based on Patient's normal

2. Abnormal

iii. Frequency

- 1. Based on patient's normal

Equipment/medical procedures:

- 1) Animal Poison Control
 - a. 1-888-426-4435
 - b. \$65 charge associated with utilizing this number
- 2) Clippers
 - a. Used to shave hair for site preparation for IV, bandaging and EKG lead placement
 - b. Removal of fur around wound site
 - c. Electric clippers preferred
- 3) Elizabethan Collar (E-collar)
 - a. Proper size for K9 (30inches)
 - b. Used as barrier to prevent further injury to patient
 - c. Used for barrier in the event a muzzle is not available or appropriate
 - i. Use instead of muzzle in the event of respiratory compromise
- 4) EKG
 - a. Pt should be in a lateral recumbent position if possible
 - b. Three leads
 - c. Placement
 - i. Above elbows and knees
 1. Green
 - a. Right hindlimb
 2. Black
 - a. Left Forelimb
 3. White
 - a. Right Forelimb
 - ii. Site prep
 1. Clippers may not be necessary if using clips
 2. Pads must be clipped
 - iii. Tips
 1. Pediatric Electrodes are the best choice if available
 2. If clip style being utilized they can be directly clipped to the fur, spray with alcohol
 - d. AED pads
 - i. Can be used if needed in place of electrodes during cardiac arrest
 - ii. Above preferred over AED pads
- 5) End Tidal Co2 Capnography

- a. Values
 - i. 35-45mmHg
- b. Placement
 - i. End of Endotracheal tube
- 6) IM Injection
 - a. Gluteal Muscle
 - i. Caution of nerves
 - b. Epaxial Muscle
 - i. Parallel to spine
 - c. Equipment
 - i. 1inch 22g needle
- 7) Intravenous (IV)
 - a. Site
 - i. Cephalic Vein (forelimb)
 - 1. Preferred site
 - ii. Lateral & Medial Saphenous (hindlimb)
 - 1. Less preferred
 - 2. May be necessary in forelimb injury
 - iii. Two IV sites may be necessary based on the patient's condition.
 - b. Equipment
 - i. IV catheter (use largest bore possible)
 - 1. Small Breed / infants
 - a. 20g to 24g
 - 2. Medium Breed
 - a. 18g or 20g
 - 3. Large / Giant Breed
 - a. 16g or 18g
 - c. Preparation
 - i. Shave with clipper
 - 1. May be deferred in the critically sick or injured patient
 - a. may result in difficulty securing the site
 - b. a small amount of shaving may be needed for proper placement
 - ii. Prep with Alcohol or Betadine wipes
 - iii. If excess debris, briefly scrub the site
 - iv. Handler occludes site proximal to the IV site or use commercial IV tourniquet
- 8) Muzzle
 - a. Manufactured
 - i. Cage/Basket

1. Preferred for patients in any distress
 2. Oxygen tubing can be placed proximally to snout for oxygen administration
 3. Should not be used in heat related injuries
 - ii. Other
 1. Should only be used if patient is not in any respiratory distress
 - b. Improvised
 - i. Kurrlex / gauze wrap loosely wrapped around the snout then tied around back of head
 1. Monitor for signs of respiratory compromise
 2. Should only be performed for short periods of time
 3. Should not be used in heat related injuries
- 9) Pet Oxygen Mask; The tighter the fit the better
- a. Supplemental oxygen: attach to oxygen via tubing
 - i. Small - <9kg
 - ii. Medium - 10 to 23kg
 - iii. Large > 23kg
 - b. BVM attachment
 - i. Attach to BVM.
 - ii. Vent holes need to be sealed for BVM use
 1. Small
 - a. Infant BVM
 2. Medium
 - a. Child BVM
 3. Large
 - a. Child/adult BVM
- 10)Pre-hydration / subcutaneous (SQ) fluids (camel backing)
- a. This is a HANDLER Procedure
 - b. Time frame
 - i. 1-2 hrs prior to activity
 - c. Site
 - i. Between Shoulder blades
 - ii. Any other site where there is excess subcutaneous skin along dorsum
 - d. Amount
 - i. Weight (lbs) x 10ml (SQ only)
 1. Most working dogs = 750 - 1000ml
- 11)Pulse Ox
- a. Placement

- i. Place on tongue, gum, vulva, prepuce, or ear
- ii. Can have false/inaccurate readings in dark pigmented skin
- iii. Can have false/inaccurate readings if tissue is not moistened/dries out
 - 1. can moisten site

Airway Management

1) Caution:

- a. A sick and injured patient may not recognize you. The patient may bite on instinct even if unresponsive. When available a second provider should hold the patient in place.
- b. If patient is in severe respiratory distress, a muzzle should not be placed onto the patient unless it is a basket style muzzle that allows 100% panting. E-Collar/cone may be used in place of a muzzle

2) Oxygen Administration

- a. Oxygen Tubing
 - i. Place near the nares at 6-10 lpm
 - ii. If muzzle is placed, run tubing into the muzzle
- b. Pet Oxygen Mask
 - i. If tolerated use appropriate size
 - 1. 10-15 lpm

3) Endotracheal Intubation

- a. Performed with patient in dorsal or lateral recumbent position
- b. Procedure
 - i. Carefully pull tongue out of the K9s mouth
 - ii. Bring the K9's head in line with the neck. Making the airway as straight as possible (sniffing position)
 - iii. Inspect airway for foreign objects. Remove with Magill forceps if available.
 - iv. If patient is not breathing on own
 - 1. Attempt 2 rescue breaths: close the snout
 - 2. Give 2 rescue breaths
 - 3. If spontaneous respirations do not occur, reattempt step 3&4
 - v. Place endotracheal tube size 8-10 or larger
 - 1. Rough measurement:
 - a. diameter of one nares = tube size to use
 - vi. If intubation attempt unsuccessful emergency tracheotomy may be necessary

- vii. After airway is opened assess for spontaneous respirations
- viii. Provide ventilations
- ix. Airway consideration
 1. Size 8-13 cuffed ETT, secured to the snout with gauze or IV tubing.
 2. Pediatric BVM for ventilations
 3. Dogs do not tolerate nasal and oral airways
 4. Miller Blade size 2,3 or 4 may be used to assist with intubation if available
 5. Check placement via chest rise and fall, auscultation and ETCO₂ (35-45)

4) Ventilations

- a. Look, listen, and feel for respiration
- b. Close mouth and perform mouth to snout ventilations
- c. Ventilate at 10-20rpm
- d. Supplement Oxygen if Available/need
 - i. Use pet oxygen mask with cap removed attached to BVM
 - ii. Use pediatric BVM if available

5) Circulation

- a. Control major hemorrhage
- b. Provide IV/IO fluids if needed

Dehydration

1) Mild to moderate

- a. Signs and symptoms
 - i. Reduced elasticity
 - ii. Tacky gums
 - iii. Decreased capillary refill
 - i. May not be present
- b. Treatment
 - i. If able to swallow and vomiting not present
 - ii. Allow patient to drink freely
 - iii. IV bolus at 10ml/kg over 10-15 minutes
 - i. Most working K9s can tolerate 750ml to 1L without complication

2) Severe

- a. Signs and symptoms
 - i. Tented skin
 - ii. dry gums

- iii. increased capillary refill >2sec
 - i. May not be present
- iv. Weak to Bounding pulse
- v. Lethargy, abnormal gait, weakness
- vi. Sunken eyes
- b. Treatment
 - i. Veterinarian care is paramount.
 - i. Transport should not be delayed
 - ii. IV/IO bolus at 10ml/kg
 - i. Most working K9s can tolerate 750ml to 1L without complication
 - iii. If critical Shock bolus is 90 ml /kg - Give ¼ shock bolus over 10-15 minutes to start and if needed repeat over 30 minute increments until stable or has received 90 ml/kg crystalloids
 - i. Consider colloids if available ie: Hetastarch
- 3) After bolus rehydration and normal vital signs
 - a. Maintenance IVF 60 ml/kg/day
 - b. Run at 1.5 - 2 x's maintenance

Heat Related Injury

- 1) Heat Exhaustion / Prostration
 - a. May be complicated with dehydration
 - b. Signs and Symptoms: Vary with intensity and duration of body temperature elevation and how quickly active cooling initiated. Can vary from below to above normal.
 - i. Rectal Temp: >103F
 - ii. RR: Fast and shallow panting
 - iii. HR: increased 140-160 bpm
 - 1. May be strong and bounding or weak and thready depending extent
 - iv. Mucosal Membranes: normal to brick red with capillary refill < 1 sec
 - v. Activity: Dog seeking cool place. May stop activity abruptly
 - vi. Vomiting may or may not be present
 - vii. Mental status: Lethargy, weakness, abnormal gait, fatigue, muscle tremors
 - viii. Stool: Diarrhea may be present
 - ix. Urine: Dark with strong odor

2) Heat Stroke

- a. Signs and Symptoms Vary with intensity and duration of body temperature elevation and how quickly active cooling initiated. Can vary
 - i. Dehydration
 - ii. Rectal Temperature: 106-108+ F
 - 1. May be below on initial evaluation
 - iii. RR: Rapid shallow panting
 - 1. Abnormal lungs sounds possible pending extent of damage and if aspiration has occurred
 - iv. HR: 140-200bpm with weak pulses if hypovolemia present
 - 1. Cardiac dysrhythmia may be present (poor outcomes)
 - v. Mucosal Membranes: pale and dry (Late stage)
 - vi. Activity: laying, unable to stand
 - vii. Mental status: Dull mentation, Lethargy, weakness, abnormal gait, seizure, muscle tremors, coma
 - viii. Stool: Diarrhea, often presentation
 - ix. Urine: if any, Dark with strong odor

3) Treatment of Heat Related Injuries

- a. Active & Passive Cooling
 - i. Move to cool place
 - ii. Begin active cooling to 103 degrees
 - iii. Continued rectal temperature to monitoring to avoid hypothermia
- b. Wet down with water
 - i. Fan afterward
 - ii. DO NOT PLACE PATIENT in kennel
- c. Alcohol on pads of feet
- d. Ice packs to groin and arm pits
- e. IV fluid therapy as needed
 - i. Cooled IVF if available
 - ii. 90ml/kg bolus, first ¼ over 10-15min and reassess. Administer remainder in 30 minute increments
 - iii. Transport should not be delayed

Trauma Management

- 1) Assessment
 - a. DCAP-BTLS
 - b. Control Life Threats as Found
 - c. Limping and increased stretching during or after activity
 - d. Howling / Vocalizing
 - i. May be sign of pain
 - ii. If not present does not negate pain
 - e. Hiding injury is common
- 2) Sprains and Strains
 - a. Signs and Symptoms
 - i. Increased resting even during activity
 - ii. Limping, holding limb up
 1. May be intermittent
 - iii. Hesitation before jumping or stepping
 - iv. No signs of injury
 1. Pending extent
 - b. Treatment
 - i. Rest follow up with veterinarian
 - ii. Veterinarian Order
 1. Compression
 2. Splinting
 - a. Rigid
 - b. Soft bandaging
 - c. monitor for worsening progression of injury
- 3) Fractured Bones
 - a. Signs and Symptoms
 - i. Deformities
 1. May not be present pending extent
 - ii. Limping, holding limb up
 - iii. Abnormal gait
 - iv. Hesitation before jump or stepping
 - v. No signs of injury
 1. Pending extent
 - b. Treatment
 - i. pain management
 - ii. Splinting in position found
 1. Some fractures may not require splinting
 2. **DO NOT** make any attempt to realign bones

4) Hemorrhage Control

a. Treatment

- i. Direct pressure with dressing
 1. Add layers as need
 2. Dressing should not be removed
- ii. Pressure dressing
 1. Dressing should not be removed
- iii. Hemostatic agents
 1. Do not use in abdominal cavity or chest cavity
- iv. Tourniquets
 1. Last resort
 2. No evidence exist of effectiveness

5) Shock

a. Early

i. Signs and Symptoms

1. Normal to mildly elevated rectal temperature (100 - 106° F)
2. Pulse: 150-200 bpm weak and thready pulse
3. Respirations \geq 25rpm
4. Capillary Refill: \geq 2 seconds
5. Mucosal Membrane
 - a. Color: Normal, brick red, pale
 - b. Tacky gums
6. HEENT: drooling, tacky lips and gums
7. Mental Status: Generally weak, but appropriate

b. Advanced

i. Signs and Symptoms (as above including)

1. Mental status: Lethargic, weakness, unable to move, decreased LOC, nonresponsive
2. HEENT:
 - a. Eyes
 - i. normal - dilated
3. Capillary Refill: > 3-4 seconds
4. Mucosal Membrane: gray to pale, dry gums and lips
5. HEENT: extremely thickened saliva or none at all
6. Temperature: often < 100°F

6) General

a. Treatment

i. Hemorrhage Control

- ii. Airway management
- iii. Circulation / Fluid Therapy
- iv. Hypothermia
 - 1. Reduce heat loss
 - 2. Provide heat support as needed

Cardiac Arrest

- 1) Assessment
 - a. CABS
 - b. DCAP-BTLS
- 2) Treatment
 - a. High Quality CPR is of upmost importance at all times
 - b. Establish IV/IO Access:
 - i. Large Bore IV access
 - ii. Only if hypovolemia suspected and known blood loss:
 - 1. Administer 22.5 ml/kg bolus to a max of 90 ml/kg
 - iii. IO may be placed
 - 1. proximal femur or distal humerus .
- 3) EKG
 - a. Placement of patient on cardiac monitor during cardiac arrest is not a priority
 - b. Most common cardiac rhythm is asystole
 - i. Defibrillation is not a priority
- 4) Airway Management
 - a. Respiratory arrest is the most common cause of Cardiac arrest in K9s
 - b. Endotracheal Intubation
 - c. End Tidal Co2 Capnography
- 5) Medications
 - a. Epi 1:10000
 - i. 0.01mg/kg IV q 3-5min
 - ii. 0.02mg/kg ETT diluted q 3-5 min
 - iii. 2-10 x's the IV dose diluted q 3-5min ETT
 - iv. If down time longer than 15min 0.1mg/kg IV
 - b. Atropine
 - i. 0.04mg/kg IV q min or 1ml/20lbs
 - ii. 0.04mg/kg ETT diluted via red rubber tube q 3-5min
 - iii. 2-10 x IV dose diluted via red rubber tube q 3-5min ETT
 - c. Vasopression

- i. 0.8 units/kg IV
 - ii. Alternate with epi or in place of epi
 - iii. 2-10 x IV dose diluted q 3-5min ETT
- d. Narcan
 - i. If Narcotic overdose suspected
 - ii. 0.01-0.04 mg/kg IV
 - 1. repeat as necessary
- e. Flumazenil
 - i. If benzodiazepine overdose suspected
 - ii. 0.01-0.04mg/kg IV
 - iii. May precipitate seizure activity
- f. Bicarbonate
 - i. If > 10-15 minutes down, pulseless
 - ii. 1 meq /kg = 1 ml/kg IV
- g. Amiodarone
 - i. Rare for V-fib/V-tach
- h. Lidocaine
 - i. Rare for V-fib/V-tach

Poisoning and Overdose

1) Signs and Symptoms

- a. Varies based on substance consumed

Substance Specific Poisoning and Overdose

1) Marijuana

a. Signs and Symptoms

- i. HR: Bradycardia / tachycardia
- ii. RR, BP, MM and CR usually normal but may vary
- iii. Temperature: hypothermic
 - 1. Mental Status: Lethargic, easily startled, sound and light sensitivity, tremors, seizures,
 - 2. Disorientation, weakness, +/- in coordination, ataxia, +/- uncommon CNS stimulation/vocalization and or hyperactivity
- iv. Stool: diarrhea if ingested with food product possible
- v. Urine: Leaking urine
 - 1. Common with ingestion
- vi. HEENT:
 - 1. Eyes: Glassy eyed appearance, dilated pupils

- vii. GI:
 - 1. Increased salivation and vomiting
 - a. common with ingestion
 - b. Treatment
 - i. Minimize external stimulation
 - ii. Activated Charcoal if no vomiting and normal mentation
 - iii. Seizure
 - 1. Benzodiazepines
 - a. Ativan: 0.2 mg /kg IV or intranasal
 - b. Valium; 0.2-0.5 mg /kg IV
 - c. Versed: 0.1-0.3 mg/kg IV or IM
 - iv. Hyperactivity
 - 1. Phenothiazines
- 2) Opioids
- a. Signs and Symptoms
 - i. HR: varies
 - ii. BP: Hypotension
 - iii. RR: Variable but can be profoundly decreased and life threatening respiratory depression
 - iv. CR & MM: Variable to normal
 - v. Temp: hypothermia
 - vi. Mental Status:
 - 1. Aggressive behavior in early stages
 - 2. Lethargy in later stages
 - 3. Ataxia
 - 4. Seizures
 - 5. Coma / unconsciousness
 - vii. HEENT:
 - 1. Panting
 - 2. Dilated pupils
 - 3. Increased salivation
 - 4. Vomiting
 - b. Treatment
 - i. Supportive Care
 - 1. Fluid administration
 - 2. Airway Management
 - 3. Naloxone administration
 - a. 0.01-0.04mg IV/IM/IN as need
 - b. Repeat doses may be required
 - 4. Passive warming for hypothermia

5. Seizures

a. Benzodiazepines PRN

- i. Ativan: 0.2 mg /kg IV or intranasal
- ii. Valium; 0.2-0.5 mg /kg IV
- iii. Versed: 0.1-0.3 mg/kg IV or IM

3) Narcotics / Cocaine

a. Signs and Symptoms

- i. HR: Tachycardia
- ii. RR: Bradypnea, respiratory arrest
- iii. BP: Often increased
- iv. CR & MM: Varies based on extent of hyperthermia
- v. Temp: Hyperthermia
- vi. Mental Status:
 1. Lethargy, hyperactivity Aggressive behavior, erratic behavior
 2. Twitching/tremors
 3. Hyperaesthesia (extensive physical sensitivity, especially with external stimulation)
 4. Seizures
 5. Death
- vii. HEENT:
 1. Mydriasis
 2. Vomiting
 3. Hypersalvation

b. Treatment

i. Supportive care

1. Fluid administration
2. Induced Vomiting
 - a. RISK - USE CAUTION
 - i. GI Ulceration
 - ii. Aspiration

b. Peroxide

- i. 1-2ml/KG max dose 45ml
 1. or 1ml/pound
- ii. May administer a max of 3 doses q10min

c. Apomorphine (if available from referring VMD)

- i. Only if Ingestion within 15-20 min **AND** after 10 min of no clinical signs
- ii. Oral: 6 mg tablets: ¼ to ½ tab in the conjunctival sac

1. induces vomiting usually in 5-10 minutes
 2. Flush out eye well after vomiting
 - iii. 0.03 mg/kg IV – Can repeat x 1 if needed
 - ii. Seizure
 1. Benzodiazepines PRN
 2. Transport ASAP - 24hr care needed
- 4) Amphetamines / Ecstasy: Onset of action 30 minutes to 2 hours
 - a. Signs and Symptoms
 - i. HR: tachycardia arrhythmias possible
 - ii. RR: variable can lead to respiratory failure
 - iii. BP: HTN
 - iv. MM: Variable – hypersalivation possible
 - v. CR: Variable
 - vi. Temperature: Hyperthermia
 - vii. Mental Status:
 1. Hyperactivity, erratic behavior
 2. Vocalizations
 3. Tremors
 4. Seizures
 - viii. HEENT:
 1. Mydriasis
 - b. Treatment
 - i. Supportive Care
 - ii. Airway Management as needed
 - iii. Passive Cooling
 - iv. Control Heart Rate / BP
 1. Beta Blockers
 - a. Propranolol
 - i. 0.02-0.06mg/kg IV q 20-30 till symptoms subside
 - b. Esmolol 0.25-0.5 mg/kg / minute CRI
 - v. Seizures
 1. Phenothiazines
 - a. See Serotonin Syndrome
 2. Avoid Benzodiazepines- worsens CNS stimulation
 - vi. Prevention of Serotonin Syndrome

Serotonin Syndrome

- 1) Seen with ingestion of:
 - a. Baclofen
 - b. PPA
 - c. SSRI,
 - d. Decongestants with pseudoephedrine
 - e. Amphetamines
 - f. TCAs +/- tramadol
 - g. Sleep aids; prescription and OTC
- 2) Signs and Symptoms:
 - a. Agitation, tremors
 - b. HR and Temp: increased
 - c. Excessive panting
- 3) Treatment:
 - a. Chlorpromazine: (potentiates hypotension so use with caution)
 - i. 0.05 – 0.5 mg/kg q 6-8 hr
 - ii. 0.2-0.5 mg/kg IM or SQ q 6-8 hr
 - b. Acepromazine (potentiates hypotension)
 - i. 0.01-0.1 mg/kg IV q 6-8 hr (may need as frequently as q30-60min)
 - c. Cyproheptadine:
 - i. Oral or PR
 - ii. Oral tablets can be crushed and mixed with saline and given per rectum q6-8hr
 - iii. 1.1 mg/kg
 - d. Propranolol (For tachycardia, second line after phenothiazines):
 - i. IV dosing: 0.02-0.06 mg/kg IV q20-30 min up to q6-8 min if needed
 - e. Metoprolol
 - i. 0.04-0.06 mg/kg IV q8hr
 - ii. DO NOT EXCEED 1mg q2min
 - iii. Slow Administration
- 4) Transport ASAP – needs 24-72 hour care = life threatening

Hypoglycemia

- 1) Possible causes
 - a) Ingestion of diabetic medications
 - b) Seizure
 - c) Shock
- 2) Glucose Check
 - a) Foot pad / toe nail
 - b) Ear tip
 - c) Venous

- 3) NML 80-140
- 4) Treatment
 - a) <80 with clinical symptoms
 - b) 25% Dextrose 0.5 ml/kg IV diluted 1:1

Allergic Reaction

- 1) Signs and Symptoms
 - a) Hives
 - b) Swollen face/muzzle, peri-ocular
 - c) Hyperemic
 - d) Hyper- excitability
 - e) Puritic
 - f) Wheezing
 - g) Respiratory distress
- 2) Treatment
 - a) Diphenhydramine 2.2 - 4.4 mg/kg or 1-2 mg/lb IM or PO
 - b) If no improvement in 30 - 40 min or worsening s/s
 - i) Solumedrol IV 2-6 mg/kg IV
 - ii) Dexamethasone 0.2 mg/kg IV

Gastric Dilatation Volvulus: GDV

Lay people refer to this as "Bloat"

- 1) Physiology:
 - a) The normal stomach sits high in belly
 - b) It contains a small amount of gas, some mucus, and any food being digested.
 - c) Undergoes a normal rhythm of contraction, receiving food from the esophagus, grinding the food, and getting the ground food out to the small intestine at its other end.
 - d) Normally this proceeds uneventfully except for the occasional burp.
 - e) The abnormal changes: Bloated stomach: gas and/or food stretches the stomach many times its normal size
 - f) Leads to >>> abdominal pain and distension
 - g) Unclear why but: this grossly distended stomach tends to rotate
 - h) Twists off blood supply

- i) Twists off exit for gas to be released
- j) Rapidly life-threatening.
- k) **Will die in pain in a matter of hours unless drastic steps are taken**
- l) Some animals can have signs that are intermittent and they may seem to go back to normal. Often that is because they may flip 180 to 360 degrees but flip back and forth thus, relieving temporarily the life threatening component – These patients still need to seek medical care

1) Hallmark Clinical signs:

- a) Sudden onset of abdominal distention
- b) Distress, anxiety and pain
- c) Panting, guarding the belly, anguished facial expression
- d) Prayer position
- e) Pacing, restlessness
- f) Tachycardia secondary to volume depletion/shock
- g) Multiple attempts at vomiting that are frequently unproductive (non-productive retching)
- h) Not all show all the signs –

WHEN IN DOUBT SEEK MEDICAL ATTENTION ASAP!!!!

1) Medical management:

- a) 2 large bore IV catheters asap
- b) Shock IV fluids: Recommend 45 ml/kg IV immediately and then the remaining 45 ml /kg over 15-30 minutes
- c) If you can pull bloods at the time of catheter placement – DO SO and keep on hold for the hospital
- d) ballot with stethoscope and air is audible – confirm dilation/bloat
- e) Trocarization: Needle Decompression of the enlarged stomach
- f) Clip small portion of the lateral abdomen
- g) Shave if able small area and prep briefly with alcohol
- h) Needle decompression: Using large 14 or 16 gauge catheter directly in the area (over the most distended portion of the stomach/area of greatest gastric tympany), remove stylet and then press, if fluid comes out – may need to remove and re-stick or reposition as there can be fluid and gas in the stomach

1) **PAIN MANAGEMENT Critical!!!–**

- a) Ideally: fentanyl Bolus 3-5 mcg/kg IV followed by CRI 2-5 mcg/kg/hr
- b) Fluid therapy after resuscitation: 5 ml /kg/hr -8 ml /kg/hr and titrate up /down pending vitals and response to therapy

- c) May have Arrhythmias such as VPCs (Ventricular premature contractions). If less than 6-10 per minute and no pulse deficits – restoration of the stomach position and shock treatment is needed
- d) Worse prognosis if already present at the time of initiation of medical management
- e) If > 6-10 per minute, runs of V-tach without conversion, pulse deficits lidocaine may be initiated (uncommonly needed prior to surgery)
- f) Lidocaine: bolus of 2 mg/kg lidocaine followed by a CRI of 50-75 µg/kg/min is the most common way to approach this arrhythmia (can cause nausea at higher rates)

TRANSPORT ASAP!!! NEEDS SURGICAL INTERVENTION