THE ART OF TRIAGE
FOR VETERINARY TECHNICIANS

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 dealing with the initial phone call and response when the patient comes in the door. Teach your receptionists a few key physiologic terms; they should 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.

• Triage is a continual process: you must continually re-evaluate your patient.

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 possibly 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?
- Any known trauma?
- 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?
- Specific syndromes:
  1. Unproductive vomiting in a large breed dog
  2. Depressed male cat
  3. Known toxin exposure
  4. Dachshund down in the rear

**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!!

**The primary survey: Questions to ask yourself**
**A: AIRWAY** – Is there a patent airway? Is the oral cavity/throat clear of obstructions? Is there an immediate need for a temporary tracheostomy? Is there a need for intubation?

**B: BREATHING** – Is the patient breathing? What is the character of the patient’s respirations? Is it effectively breathing? Is there need for supplemental oxygen? Can you hear breath sounds or is there a need for thoracocentesis? What is the animals posture (head and neck extended, abducted elbows)? Is subcutaneous emphysema present? What is the color of the mucous membranes? Has a bite wound disrupted the larynx or trachea? Is there evidence of thoracic penetration? Upper vs lower airway stridor?

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 MM pale? Is the CRT prolonged? Is there swelling associated with an extremity fracture? Are the extremities cool? Is there an immediate need for CPR? What is the patient’s blood pressure?

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 injected MM are a result of vasodilation and are common with sepsis or hyperthermia. It is also imperative to assess the capillary refill time (CRT). A prolonged CRT can be a result of blood loss and peripheral vasoconstriction. 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. Pulse quality is an indicator of stroke volume. Remember that cardiac output (CO) =HR x SV. In patients with significant volume loss or shock pulses are often described as “weak and thready”. Direct cardiac auscultation will reveal information about the rate and rhythm. Pulse deficits are suggestive of arrhythmias. Clinical signs that are suggestive of a decreased cardiac output are tachycardia, pale or grey MM, prolonged CRT, poor pulse quality, cool extremities and decreased urine production. Decreased CO may be due to hypovolemia, intrinsic heart failure, cardiac tamponade, arrhythmias or severe vasodilation secondary to sepsis.

**TYPES OF SHOCK:**

Shock is inadequate circulating blood flow such that oxygen delivery is insufficient to meet cellular energy and substrate needs.

1. **HYPOVOLEMIC** – blood loss, severe dehydration, trauma
2. **CARDIOGENIC** – CHF, cardiac tamponade, severe cardiac arrhythmia
3. **DISTRIBUTIVE** – sepsis, anaphylaxis, obstructive (saddle thrombus, heartworm)
4. **METABOLIC** - hypoglycemia, cyanide toxicity, sepsis
5. **HYPOXEMIC** – anemia, severe pulmonary disease, methemoglobinemia

**CATEGORIES THAT DESCRIBE SHOCK:**
1. **Early compensatory shock**: hyperemic mm, tachycardia, rapid CRT, normal or increased blood pressure

2. **Early decompensatory shock**: pale pink mm, tachycardia, prolonged CRT, normal to decreased blood pressure

3. **Late decompensatory shock**: pale gray mm, prolonged CRT, normal to decreased HR, weak pulse quality, decreased mean arterial BP and hypothermia

**TREATMENT PLAN FOR SHOCK:**

Treat immediately for shock if indicated depending on type of shock!! NOT ALL TYPES OF SHOCK ARE FLUID RESPONSIVE! Place an IV catheter and start ¼ shock bolus of IV crystalloids. Shock fluid rates: 90 mls/kg in dogs, 60 mls/kg in cats. Give initial ¼ shock bolus then re-evaluate. Shock rate for hetastarch should start with 1-3 mls/kg, then re-evaluate. Follow this with a plan for analgesia. DO NOT USE STEROIDS IN ANIMALS IN SHOCK!

**Pain control in shock/trauma cases:** Do not withhold pain medications in trauma/shock cases! Pain increases the stress response and causes tachycardia. This increased workload puts more pressure on the cardiovascular system. The safest group of pain medications to use are the opioids. Do not use NSAIDS or alpha 2 agonists in these cases!

**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. Hypothermic cats often have impaired vasopressor response to catecholamines so external re-warming alone can often help improve hemodynamic stability. Also, traumatized cats often experience systemic vasodilation which could make it difficult for them to handle aggressive fluid therapy without re-warming.

**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 mentation depressed? Is there any seizure activity? Is the animal ambulatory? Is the patient laterally recumbent with rigid forelimbs and flaccid hind limb paralysis suggestive of a Schiff-Sherrington with a spinal cord lesion somewhere between T3-L3? If so – immediately place patient on a spinal board. Is there a gag reflex? A decrease in gag puts the patient at high risk for aspiration. If the gag is absent immediate endotracheal intubation is required to protect the airway.

**Neurological considerations:**

**Levels of consciousness:**

1. **Obtunded**: State of decreased responsiveness. Less responsive to visual/tactile stimuli, quiet/dull. This may arise from a variety of complications and illnesses.

2. **Stupor**: Can be aroused only with painful stimuli. Is a sign of severe neurologic or metabolic derangement.
3. **Coma**: Cannot be aroused with any stimuli. Coma and seizures are signs of abnormal cerebral electrical activity from primary neurological disease or secondary to metabolic derangements such as hepatic encephalopathy.

**Respiratory patterns associated with intracranial lesions:**

1. **Cheynes-stokes**: periods of hyperpnea alternating with periods of apnea
2. **Central neurogenic hyperventilation**: persistent hyperventilation that may result in respiratory alkalosis
3. **Apneusis**: breathing pauses for a period at full inspiration
4. **Irregular or “ataxic” breathing**: irregular frequency and depth of respirations that typically precedes complete apnea

**Motor activity:**

1. **Ambulatory vs nonambulatory**
2. **Ataxia, hemiparesis, tetraparesis or hemiplegia**
3. **Decerebrate posture**: Opisthotonus with extensor rigidity of all 4 limbs. Mentation is stuporous to comatose. Indicates lesion of the rostral pons and midbrain.
4. **Decerebellate posture**: Opisthotonus with extensor rigidity of the thoracic limbs and either extension or flexion of the pelvic limbs is present. Patient should be responsive and have voluntary movement. Occurs with acute cerebellar lesions.

**Pupillary abnormalities:**

Pupil size is the result of balance between sympathetic and parasympathetic innervations to the eye. Parasympathetic innervation is the most important aspect when monitoring neurologic deterioration because it is mediated through the midbrain and cranial nerve III (loss of parasympathetic innervations results in mydriasis).

1. **Unilateral mydriatic, unresponsive pupil** – loss of parasympathetic innervation to the eye. Can indicate increased intracranial pressure. R/O topical ophthalmic atropine or tropicamide
2. **Bilateral miosis** – May precede bilateral mydriatic unresponsive pupils. Can be seen with diffuse metabolic encephalopathies or diffuse midbrain compression with increased intracranial pressure.
3. **Bilateral mydriatic, unresponsive pupils**: Fixed and dilated pupils. Severe bilateral compression or destruction of the midbrain or cranial nerve III. Typically from bilateral cerebral herniation.

**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.
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

“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 (Atropine, Epinephrine, Naloxone, Vasopressin, Magnesium sulfate, Lidocaine, Calcium gluconate)

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, pleurovac, 3 way stop cocks

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

Emergency surgical procedures: 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
Other emergency drugs:
Diphenhydramine, Epinephrine, DexSP, Calcium gluconate, Dextrose, Opioids
Reversals: Naloxone, Antisedan, Flumazenil

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
6. Ocular emergencies
7. Seizures
8. Anaphylaxis
9. Toxicities
10. Snake envenomation
11. Environmental emergencies: heatstroke, hypothermia
12. Electrocution
13. Feline asthma attack
14. Smoke inhalation
15. Severe big dog-little dog bite wounds

ADENDDUM

CPR: Drugs and Electronic Defibrillation

DRUGS

Most Commonly Used:

Atropine 0.54mg/ml:
Dose: 0.04mg/kg: IV or intra-tracheal. Can repeat q 3-5 mins x 3 doses.
Indication: slow heart rate or no heart rate (vagolytic)

**Epinephrine 1:1000:**

*Low Dose:* 0.01mg/kg IV. Can repeat q 3-5 mins: If no effect ↑ dose or use vasopressin.

*High dose:* 0.1mg/kg IV. *Intratracheal dose:* 0.03-0.1mg/kg IV

Indication: Asystole/no heart rate: Increases coronary and cerebral perfusion (alpha2 agonism).

**Epinephrine (low → high dose)**

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Low Dose (mg)</th>
<th>High Dose (mg)</th>
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<tbody>
<tr>
<td>5</td>
<td>0.02 (0.02ml)</td>
<td>0.22 (0.22ml)</td>
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<tr>
<td>10</td>
<td>0.04 (0.04ml)</td>
<td>0.45 (0.45ml)</td>
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<tr>
<td>20</td>
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<tr>
<td>30</td>
<td>0.13 (0.13ml)</td>
<td>1.3 (1.3ml)</td>
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<tr>
<td>40</td>
<td>0.18 (0.18ml)</td>
<td>1.8 (1.8ml)</td>
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**Lidocaine** 20 mg/ml: Dose: 2mg/kg. Indication: Ventricular premature contractions

**Less Commonly used:**

**Sodium Bicarbonate** 1 mEq/ml: Dose: 1 mEq/kg

  Indications: Severe metabolic acidosis

**Calcium gluconate** 10%:100mg/ml: Dose 50mg/kg (0.5-1.5ml/kg) SLOW bolus

  Indications: Hyperkalemia (i.e. blocked cat, Addison’s disease), low calcium (i.e., eclampsia, calcium channel blocker toxicity).

**Magnesium** 4 MeQ/ml Dose 0.2mEq/kg slowly over 10 minutes

  Indications: Refractory ventricular arrhythmias, prolonged CPR

**Vasopressin** 20 units/ml. Dose 0.2u- 0.8u/kg (IT:0.4-1.2u/kg)

  Indications: Ventricular fibrillation, ventricular tachycardia, PEA

  1 unit: 0.25mcg so 0.1-0.2mcg/kg IV.

**Amiodarone** 50mg/ml: Dose 5mg/kg over 10 minutes

  Indications: Ventricular fib after defibrillation, atrial fibrillation, V. tach

**Naloxone** 0.4mg/ml: Dose 0.04mg/kg.

  Indications: Overdose of opioid, reversal of opioid medications
**Route of administration:** Intravenous is ideal!

Intra-tracheal can be done: Most drugs should be increased 2-2.5X for intra-tracheal; Epinephrine should be increased 3-10X.

**Intra-medullary** is also a possible route; especially with very small, or very young patients

**Intra-cardiac** not recommended

**External defibrillation:** 2-5 J/kg

- 5 pound (2.2kg) = 5 → 10 joules
- 10 pound (4.5kg) = 10 → 25 joules
- 20 pound (9.0kg) = 20 → 50 joules

**UPDATED CPR GUIDELINES: KEY POINTS**

1) Sixty percent (60-70%) of arrests are *ventilatory, not* circulatory, in small animals. Respiratory arrests and vagally mediated arrests are much more common than cardiac arrests. Most cardiac arrests in small animals result from conditions that are not primarily cardiac in origin.

2) 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.

3) **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.

4) Most important factor for an arrest patient’s survival is the time from arrest to initiation of CPR

5) **External Defibrillation:** 2-5 J/kg

   Give one shock and restart compressions immediately

   *3 successive shocks no longer recommended*

6) Post-resuscitation care is **very important:** 50% of post-arrest deaths occur during the first 24 hours.

   a. Permissive hypothermia should be allowed post-resuscitation as this decreases tissue oxygen demands.
   b. Excessive fluids should be avoided unless the patient is hypovolemic. Excess fluids will decrease coronary perfusion.

7) Update on DRUGS:
a. **Steroids** are not recommended in CPR.
b. **Glucose** is not recommended in CPR (unless hypoglycemia documented)
c. **Doxapram** (Dopram) is no longer recommended.

**Common drug reversals:**

- **Naloxone** → Opioid reversal 0.01 - 0.02 mg/kg iv
- **Flumazenil** → Benzodiazepine reversal (reverses valium/midazolam) 0.02 mg/kg iv
- **Antipamezole** → Alpha 2 antagonist (reverses domitor/dexdomitor) 0.1 mg/kg iv

**REFERENCES:**