The Emergency Cat: They’re Not Dogs!

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Domestic cats are a unique species, who display a range of behaviours and characteristics that are different from other domestic species encountered in the veterinary practice. In the cat with emergency or critical illness, for example, will display clinical signs and symptoms quite separate from their canine counterparts with similar disease processes. Both veterinarians and veterinary nurses/technicians must be aware of the unique physiology and behaviours of the feline patient when assessing them for illness, as failure to do so may result in undiagnosed illness, delays in diagnostics and treatment, and prolonged morbidity and increasing mortality.

The major point to emphasize regarding cats, is that they are very subtle in their manifestations of critical illness or disease, necessitating a full assessment of vital parameters in any cat that is “not doing well” to avoid missing serious underlying problems.

What follows in this seminar is a brief outline of common clinical signs and symptoms of the cat with emergency and critical illness, and how these are different from dogs. We will conclude with a brief description of some common emergency illnesses of cats.

Cats Are Not Dogs 1: Symptoms of Hypovolaemic, Septic and Distributive Shock

Shock is a clinical condition that results from the presence of inadequate delivery of oxygen to body tissues. A myriad of receptors in the body, such as pressure receptors in the carotid arteries, chemoreceptors in the brain and osmoreceptors in the brain etc., mediate a series of physiological responses via the sympathetic nervous system and adrenal glands that trigger alterations in heart rate, cardiac contractility and blood vessel tone (among other things) to help temporarily restore tissue perfusion to the brain, lungs, heart and muscles.

- In the dog:
  - Hypovolaemic and distributive shock progresses through several stages
    - Stage 1 (compensated shock) – characterized by the “adrenaline rush” – resulting in increased heart rate and pulse quality, increased respiratory rate and depth, alert mentation, and mucous membranes that are bright pink, with short capillary refill time
    - Stage 2 (early decompensated shock) – characterized by poor tissue perfusion and vasodilation throughout the body. This results in clinical signs of weak pulses, tachycardia, depressed mentation, and pale mucous membranes with prolonged capillary refill time
    - Stage 3 (end-stage shock) – characterized by very poor blood flow through tissues that eventually results in tissue death in capillary beds. This results in what is termed a “no flow” of blood through tissues, and causes symptoms of severe depression, unresponsive to fluid therapy and oxygen supplementation, poor pulses, rapid or slow heart rate, low body temperature etc., among other symptoms such as vomiting, diarrhoea, poor urine production and death.
  - Septic shock
    - Early Septic Shock - is characterized in the dog by many of the symptoms described in hypovolaemic and distributive shock above, with the addition of
- Bright pink to (occasionally) red mucous membranes
- Bounding pulses
- A source of sepsis/infection such as a bite wound, pancreatitis, severe enteritis etc.

- Late Septic Shock – is characterized by poor vascular tone, and increased capillary permeability, leading to loss of fluid and protein from the systemic circulation into body tissues. Symptoms include the following
  - Tachycardia, often poorly responsive to IV fluid administration
  - Poor pulse quality
  - Pale mucous membranes
  - Dull mentation
  - Elevated or depressed body temperature
  - Coagulopathy/bleeding
  - Vomiting diarrhoea
  - The presence of oedema
    - Pulmonary – increased respiratory rate; rales and crackles on lung auscultation
    - Peripheral – subcutaneous fluid accumulation in gravity-dependent tissues and limbs

- In the cat:
  - Hypovolaemic shock, as well as other forms of shock such as septic shock and distributive shock result in a unique constellation of clinical signs that is quite different from those described above for dogs, that do not follow the classical “stages of shock” frequently described for dogs, and includes the following...
    - Poor pulses
    - Prolonged capillary refill time
    - Cold extremities
    - Hypothermia
    - Tachycardia or...
    - Bradycardia – this is a unique finding in cats, particularly in advanced hypovolaemic shock and in septic shock
    - Abdominal pain – regardless of the presence or absence of abdominal disease
    - Dull or quiet mentation
Cats Are Not Dogs 2: The Treatment of Shock

- Cats have a smaller blood volume as a percentage of bodyweight than dogs
  - Cats: 4-6%
  - Dogs: 6-9%
- Smaller blood volume means that the potential volume of fluid required to treat shock is smaller in cats than dogs – 40-60 ml/kg in the cat as opposed to 60-90 ml/kg in the dog.
  - Using bolus fluid therapy to treat shock in the dog, we use 10 ml/kg IV in 10 minutes (60 ml/kg/hr) repeated until clinical signs of shock resolve
  - Using bolus fluid therapy to treat shock in the cat, we use 7 ml/kg IV in 10 minutes (42 ml/kg/hr) repeated until clinical signs of shock resolve
  - If colloids such as hydroxy-ethyl starch are used as an adjunct to treating shock, the doses are different for dogs and cats too...
    - Dogs: 5 ml/kg IV over 10 minutes
    - Cats: 3 ml/kg IV over 10 minutes

Cats Are Not Dogs 3: Pulmonary Blood Pressure!

The feline lung is different from the canine lung in several key aspects regarding trauma and critical illness...

1. Pulmonary arterial blood pressures in healthy cats are between 5 and 15 mm Hg higher at rest than they are in dogs. Because of this, small increases in pulmonary arterial pressure rapidly result in the potential development of capillary wall damage, leading to inflammation, and extravasation of fluid into the pulmonary interstitium and alveoli. Increasing Starling’s forces, with the subsequent development of pulmonary oedema also contribute to the early development of respiratory compromise when compared to canine patients. Potential causes of elevated pulmonary arterial pressure include
   a. Excessive intravenous fluid therapy
   b. Increased sympathetic nervous system discharge due to hypoxia, seizure activity etc.

The physiology of the feline lung, and the increased likelihood of pulmonary interstitial and alveolar oedema development have led to the feline lung being described as a “shock organ” – not a particularly useful term – but one that describes the sensitivity of the feline lung to excess lung water in emergency and critical illness.

What does this mean for us as veterinary professionals when treating the cat with trauma or critical illness? In many textbooks, when talking about rates of intravenous fluid therapy to administer to cats with shock, or lung diseases such as pulmonary contusions, pneumonia etc., and in cats with seizures or neurogenic pulmonary oedema, the phrase “judicious use of IV fluids” is used to reflect a need to administer sufficient fluids to resolve shock, and restore normal tissue perfusion, but to avoid excessive fluid administration that may result in pulmonary oedema. This is usually done by following the following algorithm

a. Manage shock using small volume resuscitation protocol as outlined above using lactated ringer’s solution 7 ml/kg IV over 10 minutes, followed by a single bolus of a synthetic, large-molecular weight colloid such as hydroxy-ethyl starch at 3 ml/kg IV over 10 minutes, followed by boluses of lactated Ringer’s solution to effect.

b. After treatment of shock, reduce crystalloid fluid rate to maintenance rates to avoid excess fluid accumulation in the lung tissue. Addition of synthetic colloids such as hydroxy-ethyl starch at rates of 10 ml/kg/day may be used to provide colloid oncotic pressure in patients with trauma or inflammatory/infectious disease.
Cats Are Not Dogs 4: Respiratory Distress!

Cats are quite different to dogs when presenting with respiratory disease. Whereas dogs often display open-mouth breathing, loud respiratory noises, or profound behavioural changes – depending on the location of their respiratory disease, cats are much more subtle in the clinical manifestations of respiratory disease. Frequently, the only change noted – even in the presence of severe, life-threatening respiratory compromise – is an increased respiratory rate. Careful patient observation and assessment is often required in order to diagnose and manage the cause of the respiratory illness.

Typical clinical signs of cats with severe respiratory distress are as follows...

- Lethargy
- Sternal recumbency posture – with a reluctance to move
- Rapid breathing
- Shallow breathing
- Deep breathing/exaggerated chest wall movements
- Open-mouth breathing
- Violent posture changes
- Fluid present at the nares
- Cyanosis
- Respiratory sounds (occasionally)
- Respiratory failure and death when the patient is handled, manipulated or stressed

Cats in respiratory distress, despite the apparent subtlety of their clinical signs, will frequently rapidly decompensate, and may acutely die if handled or approached incorrectly. An approach to managing these cats is outlined in brief below...

1. Provide minimal restraint
2. Provide oxygen supplementation via fly by or oxygen cage for 10 minutes to allow the patient to recover from the stress of transport
3. Observe breathing pattern and effort
   - Attempt to localise the disease to upper airway, lower airway (bronchi), pulmonary parenchyma or pleural space disease
     1. Prolonged or noisy inspiratory efforts are more commonly associated with upper airway disease
     2. Prolonged exhalation with crackles and/or wheezes +/- cough are commonly associated with lower conducting airway disease e.g. bronchial disease such as Feline Asthma
     3. Tachypnoea with increased lung sounds is usually indicative of pulmonary parenchymal disease e.g. congestive heart failure
     4. Tachypnoea with either deep or shallow breathing, +/- abdominal component, combined with reduced lung sounds is indicative of pleural space disease such as pneumothorax, diaphragmatic hernia or pleural fluid accumulation
   - Develop a “feline” differential diagnosis list for the airway breathing pattern
     1. Upper airway disease:
        a. Rhinitis – due to infections, foreign body, coagulopathy, dental disease (with oro-nasal fistula) etc.
        b. Nasal neoplasia or polyp
        c. Laryngeal paralysis
        d. Pharyngeal or laryngeal neoplasia e.g. squamous cell carcinoma, lymphoma
2. Lower airway disease (wheezes, cough)
   a. Feline asthma – is the most common cause of lower conducting airway inflammation

3. Pleural space disease
   a. Congestive heart failure (murmur or gallop rhythm is frequently auscultated) with pleural fluid accumulation
   b. Pyothorax
   c. Pneumothorax
   d. Chylothorax
   e. Haemothorax
   f. Diaphragmatic hernia

4. Pulmonary parenchymal disease
   a. Cardiogenic pulmonary oedema (congestive heart failure) – heart murmur or gallop rhythm is frequently auscultated
   b. Non-specific inflammatory lung disease (aspiration pneumonia is quite uncommon, but acute inflammatory pulmonary parenchymal lung disease is common in inflammatory diseases such as pancreatitis, sepsis, infection etc.)
   c. Neoplasia
   d. Atelectasis
   e. Near drowning
   f. Pulmonary contusions

iii. Acute Management of Respiratory Distress in the Cat
1. Upper airway disease
   a. Fly-by oxygen therapy
   b. Mild sedation with butorphanol 0.05-0.2 mg/kg SC or IV
   c. Endotracheal intubation under light anaesthesia
   d. Tracheostomy if intubation not possible

2. Lower airway disease
   a. Fly-by oxygen
   b. Mild sedation with butorphanol 0.05-0.2 mg/kg SC or IV
   c. Corticosteroid therapy: methylprednisolone sodium succinate 3-5 mg/kg IV, or inhaled corticosteroids (Fluticasone inhaler; 1 puff = 120-220 micrograms q 12 hrs.)
   d. Bronchodilatation: albuterol (inhaler; 1 puff = 100 micrograms) q 30 minutes; or Terbutaline 0.01 mg/kg IV/IM/SC q 8 hrs.

3. Pulmonary parenchymal disease
   a. Oxygen supplementation
   b. Mild sedation with butorphanol 0.05-0.2 mg/kg CS or IV
   c. Endotracheal intubation if SpO₂ <90% whilst the patient is on supplemental oxygen, or if the patient is suffering severe dyspnoea
   d. Perform radiographs once the patient is stable to assist in diagnosing the underlying disorder
   e. If cardiac disease suspected
      i. Furosemide 2-4 mg/kg IV or IM q 4 hrs.
      ii. Glyceryl tri-nitrate oral spray: 1 spray PO q 1-2 hrs. PRN
      iii. ACE inhibitors e.g. benazepril
      iv. Beta blockers e.g. atenolol
   f. If pneumonia is suspected
i. Antibiotics: amoxicillin-clavulanic acid; ticarcillin/clavulanic acid
ii. Bronchodilator therapy (controversial): Terbutaline
iii. Mucolytic therapy (if patient is coughing): acetylcystiene

**g. Pulmonary contusions**

i. Oxygen therapy
ii. Analgesia
iii. Judicious use of IV fluids

**h. Smoke inhalation**

i. Oxygen therapy
ii. Bronchodilators
iii. Ventilation therapy

**i. Parasitic pneumonitis**

i. Fenbendazole
Diagnostic Flow-Chart for Feline Respiratory Disease

Cat with Respiratory Distress

Loud Sounds?

Yes

Upper Airway Disease Most Likely

No

Increased Lung Sounds, Crackles or Wheezes?

Yes

Low Temperature, Gallop Rhythm?

Yes

Likely Heart Disease

No

Airway or Non-Cardiogenic Disease Most Likely

No

Dull Lung Sounds; Abdominal Effort in Breathing?

Yes

Pleural Space disease
Cats are Not Dogs 5: Thoracic Radiographs!

Cats’ lung are unique – especially when imaged with radiography. The classical peri-hilar alveolar-interstitial densities seen in dogs with congestive heart failure, for example, are rarely identified in cats, among several other unique features of the cat lung. Below is a short description of radiographic findings in the most common feline respiratory conditions observed in the emergency centre...

1. Cats with pulmonary parenchymal disease typically have combinations of interstitial and alveolar abnormalities on thoracic radiography. The distribution of these non-specific infiltrates, however, may assist in determining the cause of respiratory distress.

2. Diffuse or caudo-dorsal infiltrates: viral pneumonitis or neurogenic pulmonary oedema

3. Cranio-ventral infiltrates: bacterial bronchopneumonia

4. Nodular or military (multiple small nodules) infiltrates: fungal pneumonia

5. Mediastinum shifting to the left or right: lobar consolidation due to lung disease

6. No specific signs and a history of trauma: pulmonary contusions; frequently associated with pneumothorax, fractured ribs, diaphragmatic hernia etc.

7. Normal lungs in a patient with respiratory distress localised to pulmonary parenchyma: pulmonary thromboembolism; frequently associated with a heart murmur or gallop rhythm

8. Patchy, diffuse interstitial lung pattern: congestive heart failure; often associated with engorged pulmonary veins

Cats are not Dogs 6: Cardiac Emergencies

Whereas dogs with cardiac disease may frequently present with a history of gradual exercise intolerance, soft cough on mild exertion – with or without a terminal retch, etc., that progresses to increased respiratory distress, cyanosis, productive cough, collapse and death, cats with cardiac disease usually present with a per-acute onset of symptoms of decompensation.

Typical symptoms of cats with cardiac emergencies include the following...

- Acute respiratory distress – characterized by marked tachypnoea, occasional open-mouth breathing; haemoptysis (coughing up blood), exaggerated chest wall movements, and orthopnoea (postural changes made by patients in respiratory distress, such as abduction of the elbows, extending of the neck, abdominal efforts during inhalation and exhalation).
  - Note that many cats with acute congestive heart failure may have significant pleural effusion, which may cause symptoms of increased respiratory rate and effort, associated with dull or absent lung sounds, and muffled heart sounds.

- Syncope – although relatively rare, occasionally cats will develop syncope if cardiac arrhythmias (including severe tachycardia) occur in association with advancing cardiac disease

- Hindlimb paresis – secondary to thrombosis of the aortic trifurcation, which results in acute onset of hindlimb paresis, often associated with vocalization and severe tachypnoea and/or dyspnoea, aggression, and open-mouth breathing/panting

In addition to the difference in symptoms observed in cardiac disease in cats, it can also be difficult to diagnose heart disease in the cat, if the traditional canine paradigm’s used in interpretation of thoracic radiographs, or thoracic/cardiac auscultation are followed. Some examples follow...

- Detection of murmurs, gallops and other physical examination findings of early or mild heart disease in cats can be challenging
Thoracic radiographs are relatively insensitive in detecting heart enlargement in cats, with most changes being quite subtle in nature.

Because of the high sympathetic tone in the cat, almost all forms of heart disease in the cat are associated with diastolic heart failure— that is — the heart rate becomes too rapid to allow left ventricular filling, decreasing cardiac output.

Treatment of heart failure in the cat is similar in many ways to the dog, with a few key exceptions. In general, regardless of the cause of the underlying heart disease, emergency treatment of the cat with acute heart failure involves the following...

1. Oxygen therapy
2. Diuretic therapy: furosemide given at 1-2 mg/kg q 2 hrs., or 2-4 mg/kg q 4 hrs. Response to diuretic therapy involves assessing respiratory rate - with a lower respiratory rate being associated with resolution of respiratory distress and pulmonary oedema.
3. Thoracocentesis: to remove pleural fluid, using a 21-23 G butterfly catheter placed in the 7th intercostal space, will result in improvement in respiratory reserve, tidal volume and relief of stress.
4. Dilated cardiomyopathy – is relatively uncommon in cats, but may be seen occasionally. Dilated cardiomyopathy is associated with poor systolic function secondary to poor myocardial contractility, and can be managed somewhat by administering dobutamine at a dose of 2-5 micrograms/kg/min by constant rate infusion. Taurine supplementation @ 250-500 mg/cat Q 12 hrs. may also be recommended for cats with dilated cardiomyopathy.
5. Hypertrophic cardiomyopathy – is a common cause of heart failure in cats, and can be managed by
   a. Furosemide 1-2 mg/kg PO q 12 hrs.
   b. ACE inhibitors: benazepril @ 0.25 mg/kg PO q 24 hrs.
   c. Atenolol 6-10 mg/cat PO q 12-24 hrs.

**Cats are not Dogs 7: Pharmacology!**

Cats have a unique physiology that renders them susceptible to many acute drug toxicoses when compared to their canine counterparts. Here are some examples...

1. Paracetamol
2. Lidocaine
3. Diazepam
4. Permethrin

Cats that have been exposed to ingested toxicants may require gastrointestinal decontamination. However, whereas in dogs, administration of emetic agents such as Apomorphine can result in reliable emesis, the same is not true for cats. In fact, induction of emesis in cats with xyalzine (the most reliable emetic drug in cats) is associated with emesis in only 50% of cats, necessitating anaesthesia and gastric lavage to remove ingested toxicants in most cats.
Cats are not Dogs 8: Acute Abdominal Pain

The acute abdomen refers to a rapid onset of abdominal pain. Acute abdominal pain is often associated with severe, life-threatening intra-abdominal disease in both the dog and cat, but may also be associated with disease outside the abdominal cavity, such as spinal disease, body wall injury etc.

Dogs with abdominal disease frequently present with obvious abdominal discomfort – making it relatively straightforward to embark on a diagnostic pathway to investigate potential causes of the pain. Cats, on the other hand, frequently do not display signs of overt abdominal discomfort, even in the presence of severe intra-abdominal illness, making abdominal assessment critical to embark on in most cases of feline illness, in order to avoid overlooking potentially serious disease.

An abdominal assessment should be performed on most cats with signs of systemic illness, as abdominal pain is an inconsistent finding with abdominal disease.

Abdominal disease in cats can arise from any abdominal structure, as well as the abdominal wall, spine or extra-abdominal disease. A list of possible causes of abdominal discomfort in the cat is listed below...

### Causes of Abdominal Pain in Cats

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<thead>
<tr>
<th>Gastrointestinal disease</th>
<th>Hepato-biliary disease</th>
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<tr>
<td>• Foreign body</td>
<td>• Cholangiohepatitis</td>
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<td>• Intestinal perforation</td>
<td>• Biliary obstruction</td>
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<tr>
<td>• Intestinal obstruction</td>
<td>• Cholecystitis</td>
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<td>• Ischaemia of the intestines</td>
<td>• Hepato-biliary neoplasia</td>
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<tr>
<td>• Neoplasia</td>
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<tr>
<td>• Gastroenteritis, colitis</td>
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<td>• Intussusception</td>
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<td>• Intestinal ileus</td>
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<th>Urogenital system</th>
<th>Pancreas</th>
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<tr>
<td>• Urethral or ureteral obstruction</td>
<td>• Pancreatitis</td>
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<tr>
<td>• Urinary tract rupture</td>
<td>• Pancreatic neoplasia</td>
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<td>• Pyelonephritis</td>
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<tr>
<td>• Urolithiasis</td>
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<td>• Acute renal failure</td>
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<td>• Renal neoplasia</td>
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<tr>
<th>Pyometra</th>
<th>Body wall</th>
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<tr>
<td>• Septic peritonitis</td>
<td>• Body injury</td>
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<tr>
<td>• Haemoperitoneum</td>
<td>• Abdominal wall hernia</td>
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<td>• FIP</td>
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<td>• Disseminated neoplasia</td>
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<th>Peritoneal disease</th>
<th>Referred pain</th>
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<tr>
<td>• Septic peritonitis</td>
<td>• Intervertebral disc disease</td>
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<td>• Haemoperitoneum</td>
<td>• Spinal neoplasia</td>
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<tr>
<td>• FIP</td>
<td>• Pelvic trauma</td>
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<td>• Disseminated neoplasia</td>
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Appropriate diagnostic work-up for an acute abdomen (or unwell cat with no abdominal pain) should include the following:

- **Blood tests:** haemogram, serum biochemistry and electrolyte panel, coagulation panel and glucose
- **Urine analysis:** urine specific gravity, chemistry, sediment evaluation, +/- culture and antibiotic sensitivity
- **Radiography of the abdomen**
  - Radiography of the thorax is indicated in patients with concurrent abdominal and respiratory symptoms
- **Ultrasonography of the abdomen**
  - Any free fluid found within the abdominal cavity should be collected for analysis using fluid biochemistry and cytology analysis
- **Surgical exploration of the abdominal cavity**
  - Indicated in patients with undiagnosed acute abdominal discomfort
  - Biopsies of the gastrointestinal tract, liver etc. should be obtained in patients in which a “negative” finding in an exploratory laparotomy is encountered, as neoplastic lesions, inflammatory bowel disease and pancreatitis, hepatopathy etc., may all be diagnosed on biopsy
An Approach to the Acute Abdomen in the Cat

(Modified from Drobatz/Costello “Feline Emergency and Critical Care Medicine”)

Abdominal Pain

Patient Assessment and Stabilisation

Blood and Urine Analysis

Radiography of the Chest and Abdomen

Definitive Diagnosis

Abdominal Ultrasound

Abdominal Effusion

Fluid Collection and Analysis

Definitive Treatment +/- Exploratory Laparotomy

No Abdominal Effusion

No Definitive Diagnosis

Radiographic Contrast Study

Definitive Treatment +/- Exploratory Laparotomy

No Definitive Diagnosis

Definitive Treatment +/- Exploratory Laparotomy
Cats are not Dogs 9: The Urinary Tract!

Cats have a number of unique features in their urinary tract that are important to know – as they have impacts on clinical pathology, reactions to drugs, and on what can go wrong! Here’s a short-list...

1. Cats have less nephrons than dogs: Nephrons – the individual units that make up the filtering, excretion and concentrating function part of the kidney are critical to patient survival. The kidney is unable to re-grow nephrons once they are damaged, making preservation of nephrons extremely important if our patients are to avoid developing renal failure. Because cats have less nephrons than dogs, they are more susceptible to many agents that can damage the kidney, including non-steroid anti-inflammatory drugs such as meloxicam, carprofen etc., anaesthetic agents, and some antibiotics (such as the amino-glycosides). This sensitivity necessitates that we as veterinary professionals ensure the following...
   a. That cats are well-hydrated prior to administration of any potentially nephron-toxic drug
   b. That cats who are anorexic, be placed on intravenous fluids to provide hydration prior to any potentially nephron-toxic drug administration e.g. anaesthesia for teeth cleaning, radiography, ultrasound etc.
   c. That the doses of potentially renal toxic drugs be reduced if appropriate in cats with advancing age, or who have clinical or biochemical evidence of renal insufficiency
   d. That cats be regularly monitored for the development of renal disease if they are elderly, or if they have illness that may result in dehydration, reduced renal function (such as urethral obstruction for example), through the use of serum biochemistry and urine analysis

2. The most common cause of acute renal failure in cats is urethral obstruction: urethral obstruction is common in cats – being one of the most common presentations for urinary tract disease in the emergency setting. Urethral obstruction is a nephro-toxic event – because urine flow through the kidneys slows, reducing glomerular filtration, eventually causing renal tubular damage. This makes appropriate management of the patient with urethral obstruction extremely important – with attention being paid to the following
   a. Ensuring blood volume restoration and rehydration occur rapidly
   b. Using anaesthetic drug protocols that minimise hypotension (avoiding high doses of isoflurane, high dose propofol etc.)
   c. Avoiding the use of non-steroid anti-inflammatory drugs such as meloxicam until patients are well-hydrated, and urinating normally
   d. Ensuring that patients are maintained on intravenous fluid therapy at higher-than-maintenance rates (unless cardiac or other disease limits tolerance of IV fluids) until they are eating normally, and beginning to voluntarily drink to avoid post-relief of obstruction.

3. Cat urine has the following unique properties when analyzed...
   a. It is more concentrated than dog urine – with urine specific gravity values less than 1.035 representing sub-optimal concentration
   b. Struvite crystals can be a normal finding in cat urine. Large quantities of crystals, in the presence of clinical signs of lower urinary tract disease, however, are supportive of urinary disease, including infection
   c. Stress can elevate serum glucose concentrations above the normal threshold, leading to glycosuria – meaning that not all glycosuria is caused by diabetes mellitus!
Cats Are Not Dogs 10: The Neurological System

The neurological system is complex, and controls everything from mentation and posture to heart rate and bowel regulation. Examining the neurological system is complex too. The neurological evaluation of dogs and cats involves a complex assessment of reflexes, responses to stimuli, and posture assessment, mentation assessment, among other, more involved tests.

Cats are unique creatures to conduct a neurological examination on, in that they frequently will display either a lack of tolerance to repeated examinations, becoming aggressive, or difficult to handle, or will adopt a more submissive posture during evaluation, that results in the appearance of loss of some reflexes or responses, despite them actually being present!

The following short list outlines some helpful tips in regards to the neurological cat that will assist you in avoiding errors in judgment of your neurological examination findings

- The neurological examination in the cat should be carried out in an efficient and well-planned manner, interspersed with pauses, if the patient becomes uncooperative or stressed
- Repeated neurological evaluations are likely to provide a more accurate assessment of the true neurological function rather than a single examination
- Neurological deficits in the limbs are best assessed using the hopping reflex, rather than placing or knuckling reflexes
- Idiopathic epilepsy is uncommon in the cat when compared to the dog – meaning a cat that presents with seizures should be evaluated for extra-cranial (toxic, metabolic causes) and intra-cranial (meningitis, neoplasia etc.) early following presentation

With regards to management of patients with neurological emergencies such as altered mentation, seizures etc., the following points are worthy of note...

- Cats may develop an acute hepatopathy with oral doses of diazepam. For this reason, oral diazepam is not recommended in cats
- Rectally administered diazepam is not reliably absorbed
- Starvation or reduced food intake can result in fatty deposits within the liver, (called hepatic lipidosis) which can result in reduced liver functionality, and the development of bizarre neurological signs ranging from behaviour changes such as excessive salivation/ptyalism to depression or seizures – so-called hepatic encephalopathy. Treatment of hepatic encephalopathy is complex, and involves (among other things)...
  - Enteral feeding
  - Antibiotic therapy with amoxicillin or metronidazole
  - Lactulose administration PO +/- retention enema
  - Evaluation of coagulation status, etc. and management as required
- Cats that are anorexic for several days (more than 203 days), or who eat an all-fish diet can develop clinical signs of neurological dysfunction, including depression, seizures etc. Cats with a history of anorexia or fish-only diet should receive thiamine supplementation @ 50-100 mg/cat IM or SC q 12-24 hrs as part of their disease management
Conclusion:

Cats are unique animals with peculiarities of great medical importance. There are many more unique features of the emergency cat than are presented here, and astute patient observation, repeated examination, and detailed investigations are frequently required in order to both achieve diagnoses in cats with emergency illness. Furthermore, the physiology of the cat is such that drug therapy, fluid therapy and other interventions need to be tailored specifically for the cat – rather than the cat being considered an extension of the spectrum of therapy applied to their canine counterparts in veterinary medicine and surgery.

References:


