



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2012

# Veterinary Emergency and Critical Care Paper 1

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer all **FOUR (4)** questions

All questions are of equal value

Answer **FOUR** questions each worth 30 marks .....total 120 marks

# Paper 1: Veterinary Emergency and Critical Care

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**Answer all four (4) questions**

1. In regards to canine dystocia, answer **all** of the following questions:
  - a) State the average length of gestation in the dog. *(1 mark)*
  - b) Briefly describe the physiology of the three stages of labour (parturition), including average duration of each stage and clinical signs seen during these stages. *(9 marks)*
  - c) List **five (5)** criteria for diagnosing dystocia in the dog. *(5 marks)*
  - d) List **three (3)** indications that a bitch may have functional dystocia and **three (3)** indications that she may have obstructive dystocia. *(6 marks)*
  - e) List **three (3)** treatment options for primary uterine inertia. Include in your answer the mode of action, or reasoning, for each treatment choice. *(9 marks)*

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2. Patients with chronic heart failure have an increase in renin angiotensin aldosterone system (RAAS) activity, which may lead to adverse cardiovascular effects and progression of heart failure in the long term.

In regards to the above statement, answer **all** subparts of this question:

- a) Describe short-term compensation in heart failure. Include in your answer how this is initiated and how this type of compensation benefits the animal. *(6 marks)*
- b) Describe the RAAS, including what factors lead to activation of the system in heart failure. Your description may include a diagram. *(12 marks)*
- c) List the physiologic effects that angiotensin II has on the body. *(6 marks)*
- d) List the physiologic benefits of spironolactone in patients with heart failure and indicate how it interacts with the RAAS. *(6 marks)*

3. Answer **both** subparts of this question:

- a) For **each** of the following antibiotics:

- enrofloxacin
- clindamycin
- amoxicillin

list the following:

- i. mechanism of action *(1 mark each)*
  - ii. clinical indications for the use of this antibiotic in cats and/or dogs *(3 marks each)*
  - iii. potential adverse effects that may occur with the use of this drug. *(2 marks each)*
- b) Urethral catheterisation for urine collection is associated with nosocomial urinary tract infections.

In regards to the above statement, answer **all** subparts of this question:

- i. Define the term ‘nosocomial infection’. *(2 marks)*
- ii. State the estimated risk of infection with urethral catheters in situ 24 hours. *(2 marks)*
- iii. Describe **four (4)** techniques that are used to decrease the incidence of these infections. *(8 marks)*

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4. Answer **all** subparts of this question:
- a) Describe the pathophysiology of ethylene glycol toxicity. *(12 marks)*
  - b) Define oliguric renal failure. *(1 mark)*
  - c) Briefly describe the factors that can cause acute renal failure in a critically ill patient with systemic inflammatory response syndrome. *(5 marks)*
  - d) Explain the modes of action of the following drugs for the treatment of oliguric renal failure:
    - i. mannitol *(3 marks)*
    - ii. furosemide. *(3 marks)*
  - e) Briefly explain the principles of peritoneal dialysis. Include in your answer the theory behind the procedure, **two (2)** indications and a brief description of the technique. *(6 marks)*

**End of paper**



# Australian and New Zealand College of Veterinary Scientists

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June 2012

## Veterinary Emergency and Critical Care Paper 2

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer all **FOUR (4)** questions

All questions are of equal value

Answer **FOUR** questions each worth 30 marks .....total 120 marks

# Paper 2: Veterinary Emergency and Critical Care

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Answer all four (4) questions

1. A one-year-old, 25kg male castrated Australian cattle dog is presented to you for 48 hours of vomiting and weakness. The dog also passed bloody diarrhoea this morning and now seems unable to walk. There are shrub-like palms and lilies in the backyard and the owner is worried that the dog has been chewing on them. He has recently been changed to a diet of camel meat due to itchy skin.

On physical examination, the dog is obtunded to stuporous, has a heart rate of 150 bpm, a respiratory rate of 45 bpm, pale and icteric mucous membranes with a capillary refill time of 3 seconds, poor pulse quality and cold paws. He has a mild increase in respiratory effort. His rectal temperature is 38.0 degrees celsius and on rectal exam, there is frank blood and loose stool. The rest of the exam shows no significant abnormalities.

Your nurse has already placed an intravenous catheter.

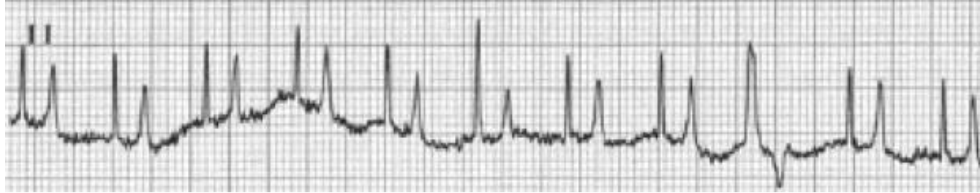
- a) List **three (3)** actions you will take immediately (within the next 30 minutes) in regards to stabilising this dog. They may be therapeutic or diagnostic. Briefly justify each choice (1-2 sentences). *(8 marks)*
- b) You have now received results from blood work submitted earlier. They show markedly elevated liver enzymes and high bilirubin levels, indicating severe acute liver failure. Although the dog is ambulatory after initial treatment, he is now circling, head pressing and appears disorientated. He then has a tonic-clonic seizure. Outline the management of this dog's neurological signs and explain why you have chosen each treatment modality. *(10 marks)*
- c) You notice this dog has mild epistaxis, and is oozing around his catheter site. List which diagnostic tests you would run in this dog to assess his coagulation status. Briefly explain how each test helps you to identify the problem. *(10 marks)*
- d) List **two (2)** likely differential diagnoses, given the history of this patient. *(2 marks)*

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2. A two-year-old male Golden Retriever dog presented to your clinic shortly after being hit by a car. On initial presentation he is stuporous. His neurological examination revealed anisocoria with mid-range pupil on the right and miotic pupil on the left, nystagmus with fast pace to the right, decreased gag reflex and medial strabismus of the left eye. Apart from a heart rate of 110, the rest of his physical exam is unremarkable.
- a) Describe your initial medical management of this patient's brain injury. *(12 marks)*
  
  - b) Based on the neurological assessment, indicate the location of the lesion/s based on each abnormal parameter. *(12 marks)*
  
  - c) One hour later, the dog is comatose and his pupils are mydriatic bilaterally with no response to bright light. He is also hypertensive and bradycardic. List **three (3)** possible reasons for the decline in his neurological status. *(3 marks)*
  
  - d) Mean arterial pressure (MAP) is often monitored in head trauma patients. Explain what impact this parameter has on cerebral blood flow in a patient with traumatic brain injury. *(3 marks)*

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3. A six-year-old male neutered cat presents to your clinic with a 24-hour history of lethargy and inappetance. On further questioning, the owners tell you he has been urinating in inappropriate places for a week and straining to urinate. On examination, he has a very large and painful bladder. You perform an electrocardiogram (ECG) as his heart rate seems low.



ECG Paper speed = 25 mm/s; 2 cm = 1 mV.

- a) Analyse this ECG and list any abnormalities found. (6 marks)
- b) List the most likely cause for the arrhythmia in this patient and briefly describe the pathophysiology. (4 marks)
- c) Discuss your management of the arrhythmia in this patient, including the mechanism of action and potential adverse effects of any medications used. (15 marks)
- d) The urethral obstruction was relieved in this cat via catheterisation. Name **five (5)** complications that may prolong recovery from this problem or cause a recurrence of the problem. (5 marks)

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4. A three-year-old spayed female Labrador retriever presents to your clinic for 24 hours of progressive weakness and three episodes of productive retching (white froth). The dog lives in an area of bushland on the east coast of Australia.

On physical examination, the heart rate is 110 bpm, the respiratory rate is 40 bpm. On thoracic auscultation, there is a prolonged inspiratory phase and a mild increase in effort on expiration.

The dog has generalised weakness and can't stand, though she can maintain sternal recumbency. The segmental, or spinal, reflexes are reduced in all four limbs. The right eye has no palpebral reflex.

The rest of the physical examination was unremarkable.

- a) List the problems identified from physical examination. (2 marks)
- b) List **six (6)** differential diagnoses for the neurological abnormality. (3 marks)
- c) An engorged grey tick (*Ixodes holocyclus*) is located ventral to the right eyelid.
  - i. Describe the grading system for tick paralysis patients. (7 marks)
  - ii. Allocate a tick paralysis grade for this patient. (1 mark)
- d) List **five (5)** complications of tick paralysis and, for each complication, indicate one way you may try to prevent it. (10 marks)
- e) The next morning, the dog is tachypnoeic with increased respiratory effort and has crackles on the right side of the thorax on auscultation.

An arterial blood gas is performed while the dog is breathing room air, with the following results (reference range in parentheses):

|                   |        |               |
|-------------------|--------|---------------|
| PaO <sub>2</sub>  | 55mmHg | (90-100 mmHg) |
| PaCO <sub>2</sub> | 28mmHg | (36-44 mmHg)  |

Explain the probable physiologic basis for this dog's hypoxaemia. Include in your answer why this dog is able to excrete carbon dioxide so effectively yet remains hypoxaemic. (7 marks)

**End of paper**