Australian College of Veterinary Scientists

Membership Examination

June 2010

Veterinary Emergency and Critical Care

Paper 1

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

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

Answer **four (4)** from the five questions **only.**

All questions are of equal value.

Subsections of questions are of equal value unless stated otherwise.

Paper 1: Veterinary Emergency and Critical Care

Answer four (4) from the five questions only.

1. A cat presents to you after injuring its left hindlimb on a piece of fencing wire. On examination you find a deep laceration through the skin and subcuticular tissues of the caudal metatarsus. Answer **each** of the following:

   a) Describe the physiology of pain sensation associated with this injury. Include an illustration of the pain pathway in your answer. (40% of question marks)

   b) Using your pain pathway illustration, show where different classes of analgesics have their effects. (20% of question marks)

   c) Discuss the benefits of using a balanced analgesic regime in this patient. Include the classes of drugs that you would use and outline your reasons for choosing **each** drug. (40% of question marks)

2. Answer **each** of the following:

   a) List **six (6)** potential causes of hypoperfusion. (10% of question marks)

   b) Describe compensatory mechanisms initiated by poor perfusion to tissues. (30% of question marks)

   c) Discuss how the patient's response to poor perfusion can be assessed by physical examination. Explain how this might differ between dogs and cats. (20% of question marks)

   d) Describe the changes you would expect on an initial database for a patient with poor tissue perfusion. (10% of question marks)

   NB: Initial database includes: packed cell volume, total solids, blood glucose, blood lactate, electrolytes and blood gas analysis.

   e) Discuss this statement: Increased serum lactate concentration is the most specific and least sensitive marker of hypoperfusion in dogs and cats. (30% of question marks)

3. Answer **each** of the following:

   a) Describe the differences between pressure-cycled and volume-cycled mechanical ventilation. (20% of question marks)

   b) Describe the effects of positive pressure ventilation on the cardiovascular system. (40% of question marks)

   c) List **three (3)** potential complications of mechanical ventilation and outline the pathophysiology of **each.** (40% of question marks)

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4. Answer **each** of the following:

   a) Describe the degree of severity of thermal injury. Include in your answer the appearance of the injury and the depth of the injury (the extent of epidermal and dermal damage).

   b) Describe the pathophysiological consequences of severe thermal injuries (injuries that involve >20% of the patient's total body surface area).

   c) Outline (in point form) the protocol for treatment of a patient with severe thermal injuries.

5. Choose **three (3)** of the following acute oncological emergencies and describe the pathogenesis, clinical manifestations and immediate treatment for **each:**

   a) mast cell tumour degranulation causing local and systemic signs

   b) acute tumour lysis syndrome

   c) tumour rupture of haemangiosarcoma of the spleen

   d) haematologic toxicity from chemotherapy.

End of paper

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Paper 2

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Paper 2: Veterinary Emergency and Critical Care

Answer four (4) from the five questions only.

1. Describe the techniques and materials used for **three (3)** of the following procedures:

   a) placement and maintenance of an apparatus used to measure central venous pressure in a dog

   b) placement and maintenance of a jejunostomy tube in a cat

   c) placement and maintenance of a tracheostomy tube in a dog

   d) setting up and maintaining a closed suction, underwater seal drainage system to a previously placed chest tube, using a commercial unit or three bottle technique. A diagram is required to describe the unit and show the principles of its operation.

2. Each of the following patients needs to be anaesthetised on an emergency basis. Formulate an anaesthetic plan for **two (2)** of them and explain your reasoning. Include in your answer: the drugs you would use, fluid types and rates, monitoring equipment required and drugs you would have on standby in case of complications.

   a) a 15-year-old Abyssinian with chronic renal failure for eye enucleation

   b) a three-year-old domestic short hair (DSH) cat with pneumonia for bronchoscopy and bronchoalveolar lavage

   c) a two-year-old Maltese with altered mentation and anisocoria for cerebrospinal fluid (CSF) tap

   d) a 14-year-old cocker spaniel with mitral valve disease and an enlarged left atrium for management of dog bite wounds.

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3. A two-year-old, male neutered Staffordshire bull terrier presents to you within twenty minutes of being involved in a car accident. On initial presentation he is obtunded and will respond only to painful stimuli. Pupillary examination reveals anisocoria and the pupillary light reflex is present in both eyes. He has wounds to the facial region and blood from the nose. Answer **each** of the following:

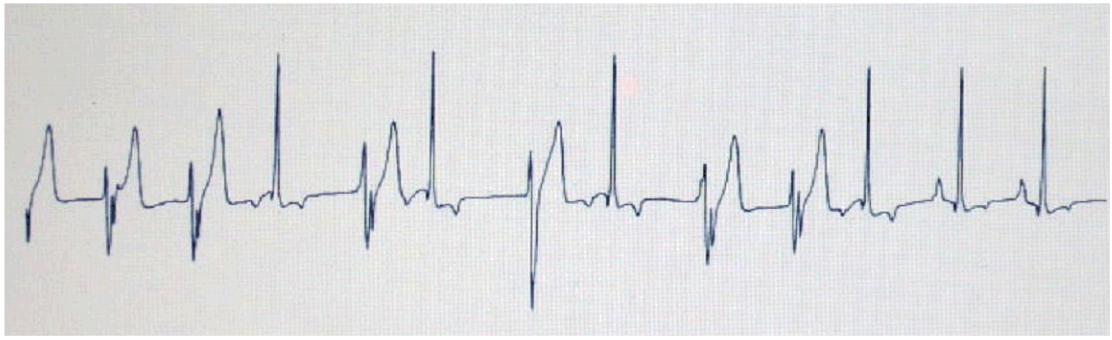
   a) Discuss your management of this patient in the first one to two hours. (40% of question marks)

   b) Discuss the parameters that you would use to show clinical progression or deterioration of the patient. (20% of question marks)

   c) Within two hours of presentation, the patient starts to show evidence of seizure activity. Describe how you would manage this. (20% of question marks)

   d) Explain Cushing's reflex and how you would manage this complication if it occurred in your patient. (20% of question marks)

4. A four-year-old, male entire labrador retriever presents to your clinic three hours after being hit by a car. You notice an abnormal cardiac rhythm on initial presentation and attach an electrocardiogram (ECG) monitor to your patient. Below is a sample of the lead II rhythm strip (25 mm/sec). Answer **each** of the following:



   a) Interpret this ECG. (10% of question marks)

   b) List the possible causes for this arrhythmia in this patient. (20% of question marks)

   c) Discuss the indications for anti-arrhythmic therapy in this situation. (30% of question marks)

   d) Discuss your management of the arrhythmia in this patient. (40% of question marks)

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5. Gemma, a five-year-old female spayed golden retriever weighing 25 kg, presents to your clinic 24 hours after having surgical repair of her right cruciate ligament. Gemma had been discharged from hospital with chewable carprofen tablets and her vet had recommended that she receive 100 mg once a day for seven days. Gemma's owners had been at work all day and when they came home, they discovered that Gemma had found and eaten all of the carprofen tablets.

Gemma is bright and alert and there are no abnormalities detected on physical examination. Answer **each** of the following:

a) Describe, as you would to Gemma's owners, the potential adverse effects of carprofen overdose and your recommendations for management of this case. (30% of question marks)

Despite your recommendations, Gemma's owners choose to take her home, remarking that 'she does not look sick'. She re-presents to you four days later with a 24 hour history of vomiting, melaena, lethargy and inappetance. On closer questioning, you find that she has not been seen to urinate for at least 18 hours.

At this stage, her physical examination findings are: heart rate 150 bpm, temperature 39.5^{o} C, respiratory rate 50 bpm, mucous membranes pink and dry, capillary refill time 3 seconds. Laboratory examination shows packed cell volume 30%, total solids 58 g/L, metabolic acidosis, hyperlactatemia and severe azotaemia. Her potassium is increased at 6.1 mmol/L.

b) Describe your initial management of this patient. (30% of question marks)

c) One of your veterinary colleagues remarks that Gemma may be oliguric. Define oliguria. (10% of question marks)

d) List **two (2)** potential causes for oliguria in this patient. (10% of question marks)

e) List **two (2)** methods are you could use to determine whether or not Gemma's azotemia and oliguria are renal in origin. (20% of question marks)

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