



Australian and New Zealand College of
Veterinary Scientists

Fellowship Examination

June 2022

Small Animal Surgery

Paper 1

Perusal time: **Twenty (20)** minutes

Time allowed: **Three (3)** hours and **45** minutes after perusal

Answer **ALL SIX (6)** questions

All **six (6)** questions are of equal value.

Answer **SIX (6)** questions, each worth 30 markstotal 180 marks

Paper 1: Small Animal Surgery

Answer all six (6) questions

1. Answer **all** parts of this question:

- a) Define the term: evidence-based veterinary medicine. *(4 marks)*
- b) Describe the ‘evidence hierarchy’ used to assess the outcome of a therapy in the veterinary literature. *(6 marks)*
- c) Discuss the proposed mechanisms of action for currently available ‘regenerative medicine therapies’ for canine osteoarthritis. *(8 marks)*
- d) Using an evidence-based approach, justify whether or not these ‘regenerative medicine therapies’ should be used to manage canine osteoarthritis in clinical practice. *(12 marks)*

2. Answer **all** parts of this question:

- a) Discuss the pathophysiologic consequences of pericardial effusion. *(7 marks)*
- b) List the types of fluid that may be obtained from a canine or feline patient with a pericardial effusion **and** for **each** type of fluid state the possible aetiopathogenesis/es. *(8 marks)*
- c) Discuss the pathophysiologic consequences of a patent ductus arteriosus. *(10 marks)*
- d) State the name for, **and** describe the mechanism of, the immediate physiological change that can occur following surgical ligation of a patent ductus arteriosus. *(5 marks)*

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3. Answer **all** parts of this question:

- a) Describe the physiology of normal micturition, including in your answer the specific roles of the parasympathetic, sympathetic and somatic nervous systems. *(16 marks)*
- b) List the key physiological and clinical features of both a 'lower motor neuron bladder' **and** an 'upper motor neuron bladder'. *(5 marks)*
- c) List **three (3)** pharmacological agents that are used for symptomatic treatment of disorders of micturition. For **each** agent, state the mode of action **and** describe the neurogenic bladder condition(s) for which it is appropriate. *(9 marks)*

4. Answer **all** parts of this question:

- a) Describe the **three (3)** phases of skin wound healing. *(6 marks)*
- b) Describe the proposed mechanism of action of negative pressure wound therapy (NPWT). *(5 marks)*
- c) Discuss advantages and disadvantages of NPWT. *(5 marks)*
- d) Justify the use of NPWT in a clinical setting, using an example of a wound reconstruction technique backed by available evidence. *(14 marks)*

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5. A two-year-old, 20 kg border collie presents with a comminuted diaphyseal tibial fracture, sustained after being hit by a car. No further injuries are noted, and the dog is clinically stable.

Answer **all** parts of this question:

- a) Define the term biological osteosynthesis as it pertains to fracture repair in a non-load sharing fracture configuration. In your answer, state and describe the type of bone healing expected in this situation. (8 marks)
- b) You consider the following surgical options for repair:
- an appropriately sized, single, locking bone plate (LCP) placed medially,
 - a type Ib external skeletal fixator placed medially, and
 - an I-Loc interlocking nail.

List the biomechanical and biologic advantages and disadvantages for **each** option, relating to recent literature where relevant, **and** the expected healing time of this fracture. (13 marks)

- c) Define 'plate working length' and its importance to construct biomechanics as it relates to placement of a medial bone plate to manage this fracture. (3 marks)
- d) Discuss the benefits and limitations of adding an intramedullary pin to a bridging plate repair with a long working length. Include relevant literature references where appropriate (6 marks)

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6. Answer **all** parts of this question:

- a) Define the term 'resting membrane potential of a neuron' **and** describe the influence of local anaesthetic agents on electrical impulse conduction. *(10 marks)*

- b) For a dog undergoing a tibial osteotomy procedure, outline the options for locoregional analgesia **and** justify their use with reference to available evidence. *(10 marks)*

- c) Outline the pathogenesis of complications associated with epidural analgesia **and**, with reference to the recent literature, formulate an opinion as to whether epidural analgesia should be utilised during total hip replacement surgery in the dog. *(10 marks)*

End of paper



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Paper 2

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Answer **ALL SIX (6)** questions

All **six (6)** questions are of equal value.

Answer **SIX (6)** questions, each worth 30 markstotal 180 marks

Paper 2: Small Animal Surgery

Answer all six (6) questions

1. A seven-month-old 3 kg toy poodle is presented for acute onset non-weight bearing left forelimb lameness. Radiographs confirm a simple transverse fracture of the distal radius and ulna.

Answer **all** parts of this question:

- a) List the proposed reasons for the high complication rate reported with distal radius/ulna fractures in toy breeds. *(5 marks)*
- b) List an appropriate method of fracture fixation and justify your recommendation. *(5 marks)*
- c) Describe the complications that may be encountered following fracture fixation in this patient **and** indicate the likely incidence of each complication. *(4 marks)*
- d) If open reduction and internal fixation of the radius with a bone plate was performed, discuss the expected effect of plate fixation on bone mineral density of the radius during the first 12 postoperative months in this patient. *(6 marks)*
- e) Describe techniques available to minimise the effect of plate fixation on bone mineral density in this case. *(5 marks)*
- f) Discuss the advantages, disadvantages and timing of bone plate removal in this patient. *(5 marks)*

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2. Answer **all** parts of this question:

- a) List **three (3)** proposed anatomic/physiologic aetiologies that contribute to frequent regurgitation in brachycephalic dogs. (6 marks)
- b) Discuss the advantages and disadvantages of available diagnostic tests used to investigate the cause of chronic regurgitation in brachycephalic dogs. (15 marks)
- c) Create and justify a peri-anaesthetic protocol to minimise the incidence and complications associated with post-operative regurgitation in brachycephalic dogs undergoing brachycephalic obstructive airway surgery (BOAS). (9 marks)

3. Answer **all** parts of this question:

- a) Discuss the utility of serum bile acid and baseline ammonia concentrations for liver function testing. Include in your answer the principles, interpretation and limitations of each test. (9 marks)
- b) You are presented with a five-month-old miniature schnauzer with a suspected portosystemic shunt. State the gold standard pre-operative imaging modality for evaluation of the portal venous system. (1 marks)
- c) List the methods of application **and** mechanisms of action of ameroid constrictors and cellophane banding for the attenuation of extrahepatic portosystemic shunts in dogs. (5 marks)
- d) With reference to the recent literature, compare the long-term outcomes **and** complication rates for ameroid constrictors and cellophane banding. (8 marks)
- e) With reference to the recent literature, discuss post-attenuation neurological signs (PANS) in dogs, indicate how it affects outcomes/prognosis, **and** justify any further medical intervention. (7 marks)

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4. A seven-month-old male entire great Dane presents with a **four (4)** week history of chronic lameness in the left forelimb after exercise. A medio-lateral radiograph indicated an osteochondritis dissecans (OCD) lesion of the left humeral head. You performed arthroscopic surgery and debridement of the lesion, removing the flap and lightly curetting the edges and bed of the lesion. The size of the lesion was large (10 x 20 mm).

Answer **all** parts of this question:

- a) Describe the aetio-pathogenesis of articular osteochondrosis. *(6 marks)*
- b) **Eight (8)** weeks after conventional debridement of the OCD lesion, the dog continues to display left thoracic limb lameness. Using justifications from current literature, discuss additional medical or surgical treatment/s that could be considered to manage this patient. Discuss how the options can be expected to affect the prognosis for this patient. *(14 marks)*
- c) Describe a conventional (open) caudolateral approach to the shoulder joint. *(5 marks)*
- d) Describe the recently reported Cheli Modification of the Cheli Craniolateral Approach for treatment of OCD of the shoulder in dogs. *(5 marks)*

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5. A five-year-old, 25 kg Staffordshire terrier presents with an acute onset of paraplegia without trauma. There is pain localised over the mid-lumbar spine and the cutaneous trunci reflex zone is normal. Your neurologic examination identifies a grade 4 transverse myelopathy (paraplegic, intact deep pain), localised to the L4-S3 spinal cord area.

Answer **all** parts of this question:

- a) Create a ranked list of differential diagnoses for this patient. (3 marks)
- b) Answer **all** sub-parts of this question:

You consider the further investigation via myelography, computed tomography (CT) or magnetic resonance imaging (MRI):

- i. List **two (2)** benefits and **two (2)** limitations of **each** of the above diagnostic modalities. (9 marks)
- ii. List the contrast agent/s appropriate for **each** modality. (3 marks)
- iii. Indicate the most appropriate diagnostic modality for this case. Justify your recommendation. (3 marks)
- c) A right-sided compressive lesion is identified at the L4/5 interspace. Name the muscular attachments that you will need to elevate from the intervertebral articular processes and accessory process when performing a hemilaminectomy. (2 marks)
- d) At surgery a small volume of disc material with extensive epidural haemorrhage is found. Discuss the prognosis for this dog based on the pre-operative presentation **and** surgical findings. (4 marks)
- e) Twenty-four hours after surgery, the dog is restless, much more painful than pre-operatively and it has deteriorated to a grade 5 myelopathy with absent deep pain perception. The panniculus reflex cut-off is now noted at the level of L1. State the most likely differential diagnosis for this deterioration. (2 marks)
- f) For the differential diagnosis listed in subpart e), describe the aetio-pathogenesis, indicate the most appropriate intervention and justify your recommendation. (4 marks)

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6. A seven-year-old desexed male cocker spaniel is presented for management of chylothorax. Bilateral thoracic drains are in-situ and have been yielding approximately 1L of chylous fluid daily. With reference to the literature where appropriate:

Answer **all** parts of this question:

- a) Discuss factors that influence the decision for, and timing of, surgery in this patient. *(6 marks)*
- b) Discuss the value of, **and** compare reported approaches to, diagnostic lymphography in this patient. *(8 marks)*
- c) Thoracic duct occlusion (TDO) is a common approach in the surgical management of chylothorax in dogs. Describe **and** compare methods of achieving TDO. *(8 marks)*
- d) Discuss the incidence of failure following attempted surgical resolution of chylothorax in the dog including reported, and proposed, mechanisms of chylothorax recurrence. *(8 marks)*

End of paper