Australian and New Zealand College of Veterinary Scientists

Fellowship Examination

June 2021

Small Animal Surgery

Paper 1

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

Time allowed: **Three (3)** hours after perusal

Answer **ALL <u>SIX (6)</u>** questions

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

Answer **<u>SIX (6)</u>** questions, each worth 30 marks .....total 180 marks

Paper 1: Small Animal Surgery

Answer all six (6) questions

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

   a) Discuss the pathophysiological consequences of ureteral obstruction secondary to ureteroliths. In your answer discuss the importance of early intervention to relieve the obstruction. *(10 marks)*

   b) Compare and contrast the indications of ureteral stenting versus subcutaneous ureteral bypass systems (SUB) in cats. Include the potential complications with, and prognosis for each technique. *(20 marks)*

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

   a) Name the **two (2)** bacteria most commonly associated with implant-associated infections in veterinary surgery. *(2 marks)*

   b) List the virulence factors of the bacteria that cause implant-associated infections. Include how these factors contribute to implant colonisation and give examples of bacteria for each virulence factor. *(8 marks)*

   c) Discuss how the design and composition of veterinary orthopaedic implants may affect implant-associated infection rates. *(10 marks)*

   d) Choose **one (1)** of the proprietary implant coatings available to veterinary patients and justify, with support from the literature, your decision regarding the use of these coated implants in your hospital. *(10 marks)*

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

a) Neoplastic cells are known to acquire capabilities necessary to allow tumours to develop and grow. These capabilities have been referred to as the hallmarks of cancer. List the **six (6)** classic hallmarks of cancer, the **two (2)** enabling hallmarks of cancer, and the **two (2)** emerging hallmarks of cancer. For each hallmark, briefly state how the cellular alteration contributes to neoplasia. *(10 marks)*

b) Name the phases of the mammalian cell cycle and very briefly describe what occurs at each stage (you may use a diagram if you wish). *(4 marks)*

c) List **four (4)** chemotherapy agents commonly used in veterinary surgical oncology. For each of the four agents, briefly describe its mechanism of action, including which stage or stages of the cell-cycle the major effect of the agent is seen. *(8 marks)*

d) Describe the normal role of tyrosine kinase in cellular physiology, and discuss how alterations to the normal function of their receptors can favour cancer formation. Briefly describe the mechanism of action of Toceranib. (*8 marks)*

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

a) Define the terms ‘tidal volume’ and ‘V/Q mismatch’. *(2 marks)*

b) Describe the technique of one-lung ventilation. *(6 marks)*

c) Discuss the advantages and disadvantages of one-lung ventilation during thoracoscopic surgery. *(6 marks)*

d) Critically evaluate the evidence for thoracoscopic pericardial window versus sub-total pericardectomy in the management of recurrent idiopathic pericardial effusion in dogs. *(10 marks)*

e) List **two (2)** major complications unique to thoracoscopy. *(2 marks)*

f) Discuss how the major complications listed in question 4 e) occur. *(4 marks)*

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5. Canine hip dysplasia (CHD) is currently described as a multifactorial, developmental, polygenetic, disorder of the coxofemoral joint, which is expressed as a quantitative trait.

Answer **all** parts of this question:

a) Define the meaning of each underlined term above in the context of CHD. *(8 marks)*

b) Describe how 'estimated breeding values' (EBV) are generated for a population of animals and the value of selection based on EBV data over selection based on individual phenotype. *(7 marks)*

c) Describe in detail the aetiopathogenesis of pain and lameness in a puppy affected by hip dysplasia. Discuss why many puppies' clinical signs improve with conservative management involving weight control and sensible exercise, only to relapse in later life. (*8 marks)*

d) Using an evidence-based approach, critically evaluate the use of double pelvic osteotomy in dogs with palpable and radiographic hip laxity, both with and without clinical signs of coxofemoral joint pain. *(7 marks)*

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6. Proximal tibial osteotomies are commonly performed for the management of cranial cruciate ligament disease in the dog. With reference to the literature, answer all the following questions.

Answer **all** parts of this question:

a) Compare and contrast the mechanisms by which tibial plateau leveling osteotomy (TPLO) and tibial tuberosity advancement (TTA) are proposed to resist femoro-tibial shear forces in the cruciate deficient stifle. *(7 marks)*

b) Discuss the reported efficacy of each of these techniques (TPLO and TTA) in the restoration of femoro-tibial sagittal kinematics in the cruciate deficient stifle. *(8 marks)*

c) Discuss how the TPLO and TTA procedures can be applied to the management of concomitant cranial cruciate ligament disease and medial patellar luxation. In your answer, include factors specific to the modified procedures that may influence the outcome. *(8 marks)*

d) Define the 'pivot shift' phenomenon as a post-operative complication of TPLO in the dog and identify factors that may contribute to its development. Additionally, discuss options for the prevention and management of pivot shift in a dog with cruciate disease. *(7 marks)*

End of paper

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Paper 2

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Answer **ALL <u>SIX (6)</u>** questions

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Paper 2: Small Animal Surgery

Answer all six (6) questions

1. Regarding thyroid carcinoma in the dog.

   Answer **all** parts of this question:

   a) List and describe the clinical aspects of the forms/types of thyroid carcinoma seen in the dog. *(5 marks)*

   b) Describe the incidence of, and risk factors for, metastatic thyroid carcinoma in dogs. *(5 marks)*

   c) Discuss the prognostic value of 'palpably fixed' versus 'mobile' tumours in dogs with thyroid carcinoma. *(10 marks)*

   d) List **six (6)** prognostic factors for thyroid carcinoma in dogs. *(3 marks)*

   e) Discuss the treatment options and prognosis for a palpably fixed follicular cell thyroid carcinoma in a dog without evidence of metastasis on thoracic imaging and lymph node assessment by ultrasound and cytology. *(7 marks)*

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2. Regarding caudal cervical spondylomyelopathy in dogs (CCSM).

Answer **all** parts of this question:

a) Define the abbreviated terms DAWS and OAWS as they pertain to CCSM. *(2 marks)*

b) Compare the typical signalment of a dog affected by DAWS to one affected by OAWS. In your answer, include a brief explanation of the proposed pathogenesis of each condition. *(5 marks)*

c) Compare and contrast the use of computed tomographic (CT) myelography versus magnetic resonance imaging (MRI) in the diagnosis of CCSM. Discuss the role of imaging the cervical vertebral column in traction for CCSM patients. *(6 marks)*

d) Supporting your answer with literature, compare the outcome of non-surgical treatment of DAWS to that of surgical treatment. Include in your answer comments regarding adjacent segment disease (so-called domino lesions). *(5 marks)*

e) Based on available literature, discuss the various reported surgical techniques for managing DAWS in the canine patient. Include a brief explanation of each technique as well as advantages and disadvantages of each. (Do not include surgical approaches in your brief explanation). *(12 marks)*

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3. Regarding spinal surgery in dogs, answer all parts of the question with reference to the literature.

Answer **all** parts of this question:

a) Discuss the controversy relating to L7-S1 dorsal laminectomy with concurrent dorsal annulectomy but without stabilisation in the treatment of a dog with degenerative lumbosacral stenosis. *(7.5 marks)*

b) Justify the use of durotomy at the time of decompressive thoracolumbar hemilaminectomy in dogs without deep pain perception caudal to the site of an acute intervertebral disc extrusion. *(7.5 marks)*

c) Outline and justify current recommendations for the application of intervertebral disc fenestration in the management of thoracolumbar intervertebral disc disease in a chondrodystrophic dog. Briefly identify factors that make these recommendations controversial. *(7.5 marks)*

d) Describe indications for, and the practice of, thoracolumbar lateral corpectomy and its potential influence on spinal biomechanics. *(7.5 marks)*

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

a) Discuss the current understanding of the aetiopathogenesis of acquired laryngeal paralysis in dogs, including the effects on other body systems. Include in your answer a description of the frequency and nature of clinical signs that are not related to upper respiratory tract obstruction and discuss how they may alter surgical decision making. *(12 marks)*

b) Discuss the effect of premedication, choice of induction agent and use of respiratory stimulants on laryngeal motion in dogs. Describe and justify an anaesthetic protocol for use when assessing a canine patient for presumed acquired laryngeal paralysis. *(10 marks)*

c) Considering unilateral crico-arytenoid lateralisation in the dog:

i. Discuss the percentage risk of post-operative aspiration pneumonia you would discuss with the patient's owner and reference the evidence from the literature that supports your advice. *(4 marks)*

ii. Discuss appropriate suture tension and location when performing this technique. *(4 marks)*

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5. A 12-month-old French bulldog is presented for exercise intolerance, heat intolerance and respiratory distress.

Answer **all** parts of this question:

a) List the primary defects and secondary changes reported in dogs with brachycephalic obstructive airway syndrome (BOAS). Indicate the reported prevalence of each of these changes in a population of affected dogs.
(10 marks)

b) With reference to Poiseuille's law (provided below), explain why brachycephalic breeds have decreased respiratory function in comparison to dolicocephalic breeds. Please define each variable of Poiseuille's Law within your answer. *(5 marks)*

$$Q = \frac{\pi \mathrm{Pr}^4}{8\eta l}$$

c) With reference to the current literature, discuss prognostic factors associated with a successful outcome in dogs with brachycephalic obstructive airway syndrome undergoing surgical intervention. *(7 marks)*

d) Describe and justify folded flap palatoplasty as a surgical technique to treat BOAS. *(4 marks)*

e) Describe the technique and justify the use of Laser Assisted Turbinectomy (LATE) to treat BOAS. *(4 marks)*

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6. A nine-month-old Staffordshire bull terrier is presented with a bicondylar articular fracture of the distal humerus (Y-fracture).

Answer **all** parts of this question:

a) Justify the use of lateral and medial plating (rather than alternative fixation methods) for this fracture configuration. *(8 marks)*

b) Discuss the advantages and disadvantages of an olecranon osteotomy compared to separate medial and lateral surgical approaches. *(7 marks)*

c) Compare and contrast the use of the following implants for this fracture configuration (limited contact dynamic compression plates, 'string-of-pearls' plates, Synthes locking plates). *(10 marks)*

d) State the prognosis for ORIF of a bicondylar humeral fracture in dogs and evidence your answer from the published literature. *(5 marks)*

End of paper