

THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

TUESDAY 30 JULY 2002

PAPER I
(3 hours)

Candidates are required to answer **FOUR** of the following **five** questions.

Allow 45 minutes per question.

Please start the answer to each question on a separate sheet; failure to do so could lose you marks.

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- 1) Discuss the mechanical and biological factors that influence cortical bone healing. How can these be influenced by the orthopaedic surgeon?
 - 2) Is laxity the sole predictor of osteoarthritis in canine hip dysplasia? Discuss this statement in relation to the current control schemes.
 - 3) Discuss the molecular and cellular events that occur in articular cartilage during the development of osteoarthritis. Use diagrams if necessary. Indicate how the dog differs from other mammalian species.
 - 4) Discuss the possible causes of multiple pathological fractures in the dog and describe your approach to the investigation of these conditions.
 - 5) Discuss the biomechanics of canine tendons and ligaments. How does the normal biomechanical behaviour of ligament and tendon relate to the microscopic and molecular structure of these tissues? How have studies of ligament and tendon biomechanics helped our understanding of canine orthopaedic disease?
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TUESDAY 30 JULY 2002

PAPER II
(3 hours)

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- 1) Discuss the influence on joint biomechanics of the currently available surgical techniques for the treatment of cranial cruciate ligament disease in the dog.
 - 2) *“Thoracolumbar disc disease in the dog is best managed by hemilaminectomy”*. Discuss this statement.
 - 3) Discuss the use of contrast media in the imaging of orthopaedic disease in the dog and cat.
 - 4) Describe the role of electrophysiology in the diagnosis of neuromuscular disease in the dog and cat.
 - 5) **Briefly** describe the treatment options for elbow dysplasia in the dog. Discuss the rationale behind the use of each.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

THURSDAY 17 JULY 2003

PAPER I
(3 hours)

Candidates are required to answer **FOUR** of the following **five** questions.

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1. Glucosamine is often given as a nutritional supplement to dogs, and other mammals, with osteoarthritis. Discuss the laboratory and clinical data on this molecule.
 2. Describe, using examples, the pathogenesis of osteochondritis dissecans (OCD). Compare and contrast naturally-occurring OCD in the shoulder and hock (talocrural) joints of the dog.
 3. Discuss the current status of gait analysis techniques in veterinary species.
 4. Distraction osteogenesis is a technique used to increase bone length. Describe, in detail, the mechanical and biological circumstances under which this will occur. Describe also the type of bone formed and how this may be controlled by surgeons.
 5. What do you understand by the term "Tissue Engineering"? Discuss some of the ways in which this concept is being developed in orthopaedic conditions today.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

THURSDAY 17 JULY 2003

PAPER II
(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

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1. **Discuss** the management of immune mediated polyarthritis in dogs and cats. Indicate how the management strategies you describe relate to the disease process.
 2. **Discuss** the factors that you would consider while trying to select the optimum method of stabilisation of a comminuted distal diaphyseal humeral fracture in an active large breed dog.
 3. With the practice of Evidence Based Medicine becoming increasingly important in defining suitability of treatment options, **discuss** some of the methods by which outcome can be measured in relation to osteoarthritis in man and animals.
 4. Critically discuss the concept of "dynamisation" ("staging down") with reference to fracture treatment using external skeletal fixators. **Describe** the practical application of this concept in the management of naturally occurring fractures.
 5. **Discuss** the indications, uses and execution of tendon transfer techniques in dogs and cats.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

WEDNESDAY 14 JULY 2004

PAPER I
(3 hours)

Candidates are required to answer **FOUR** of the following **five** questions.

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1. Write an essay discussing Degenerative Lumbar Disease in the dog. Include a detailed description of pathological changes and relate these changes to clinical signs. Indicate how a case could be investigated and managed.
 2. What do you understand by the term “**structure-modifying agent for osteoarthritis**”? How should such agents be evaluated? **Discuss** these methods in relation to man, dog and horse.
 3. “*We need a total joint prosthesis for the canine elbow*”.
Discuss this statement commenting on its validity and some of the problems that are inherent in developing such an implant for successful function.
 4. Hip dysplasia is an inherited developmental disease in dogs. Discuss the evidence surrounding the mode of inheritance in dogs. What are the main risk factors for the development of osteoarthritis (as defined by osteophyte development) of the canine hip and discuss the published evidence for these?
 5. **Discuss** the development, use, limitations and complications of interlocking nails in dogs. Briefly compare this situation to other species.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

WEDNESDAY 14 JULY 2004

PAPER II
(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

Allow 45 minutes per question.

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1. A five year-old male labrador is referred with a six month history of unilateral thoracic limb lameness. Considering the possible differential diagnoses for a dog with this signalment, describe in detail how you would investigate this case.
 2. *"Fracture reduction can be a time consuming part of surgery"*. **Discuss** this statement and describe methods of facilitating fracture reduction in dogs and cats.
 3. **Describe with the aid of diagrams** the anatomy of the temporomandibular (TMJ) joint in the dog and cat. Discuss in detail the conditions that affect the TMJ in these species, including diagnosis, imaging and treatment options.
 4. A 5 month-old Doberman presents with a severe varus deformity of the left antebrachium emanating from the distal antebrachial growth plates. In addition, the left antebrachium is 3cm shorter than the contralateral limb. With the use of appropriate diagrams, describe in detail how you would plan and execute distraction osteogenesis with a hinged circular (Ilizarov) external fixator to correct this deformity. Briefly, what are the potential complications of using this approach and how can these be avoided or treated?
 5. Write an account detailing the incidence, significance and prognosis of Primary Bone Tumours other than Osteosarcoma in the dog and cat.

THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)
WEDNESDAY 13 JULY 2005

PAPER I
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Candidates are required to answer **FOUR** of the following five questions.

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1. '*Sectioning the periosteum can alter bone development*'. **Discuss** this statement and the role of the periosteum in orthopaedics.
 2. **Review and critically evaluate** the differences between cemented and uncemented total hip replacement in the dog with reference to the literature.
 3. Patella luxation occurs in the horse, man, dog and cat. **Compare and contrast** the disease in each of the four species.
 4. **Discuss in detail** the diagnosis of canine myopathies. Illustrate your answer using appropriate examples.
 5. **Describe** the laboratory investigation of canine and feline arthropathies.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

WEDNESDAY 13 JULY 2005

PAPER II

(3 hours)

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1. **Discuss** the diagnosis, management and treatment of canine and feline osteosarcomata of the appendicular skeleton.
 2. A breeder of Bull Mastiffs has a ten-month old dog with a diagnosis of bilateral cranial cruciate disease. **Write a description** of how you would manage this case with explanation and justification for the surgical management, or otherwise, that you would recommend. Make reference to published literature to support your answer.
 3. **With the aid of diagrams** write an essay on the indications, surgical technique and prognosis for arthrodesis of the canine shoulder.
 4. An eleven year- old Labrador is referred with a chronic history of insidious onset forelimb lameness. What are your differential diagnoses? The referring veterinarian is concerned that the dog has a brachial plexus tumour – **in detail describe** how you could investigate and manage a dog with this diagnosis.
 5. **Compare and contrast** the different therapies, procedures and surgical approaches for management of intervertebral disc disease in the dog.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)
MONDAY 10 JULY 2006

PAPER I
(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

Allow 45 minutes per question

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1. Management of cranial cruciate insufficiency by alteration of the proximal tibia is popular in current practice. Explain the mechanical concepts behind the Tibial Plateau Levelling Osteotomy (TPLO), Closing Cranial Wedge Osteotomy (CCWO) and Tibial Tuberosity Advancement (TTA) techniques. **Describe** how surgical practice has been evolved to achieve the objectives for each procedure and comment on evidence of success.
 2. **Describe** the types of pathology seen in musculotendinous units when damaged. **Describe** the normal healing process in these structures.
 3. **Compare and contrast** the anatomy and pathology of the volar (palmar) sesamoid and navicular bones of the dog and horse respectively.
 4. **Discuss** the post-operative assessment of cemented total hip replacement in the dog. What factors can contribute to the premature failure of a cemented acetabular component?
 5. **Discuss** whether the traditional principles for management of articular fractures remain valid against results of long-term outcome studies of these fractures.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

MONDAY 10 JULY 2006

PAPER II

(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

Allow 45 minutes per question

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1. **Discuss** the relative merits of computerised tomography (CT), magnetic resonance imaging (MRI) and nuclear scintigraphy as advanced imaging modalities in small animal practice.
 2. **With the aid of diagrams, describe** the surgical anatomy of the canine hock. Discuss indications for pantarsal arthrodesis in the dog and describe, step by step, how you would perform this procedure in a 5yr old Dobermann.
 3. **Describe** the principles and practice of Minimally Invasive Osteosynthesis as it is used in man. **Comment** on how realistically these methods could transfer to small animal patients at the present time.
 4. You are presented with a two year-old male Bull Mastiff following a RTA which occurred 24 hours previously. The dog has sustained a comminuted diaphyseal fracture of the right tibia which is open. There is a large area of skin and soft tissue loss in the medial mid-diaphyseal area through which bone fragments are clearly visible. There is obvious gross contamination despite attempts at wound management. The lower limb is very swollen. The dog has no other problems.
Describe in detail, your management plans for this animal from the moment that it arrives in your care through to the conclusion of the case.
 5. **Discuss** intervertebral disc disease in non-chondrodystrophoid dogs
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)
MONDAY 9 JULY 2007

PAPER I
(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

Allow 45 minutes per question

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1. **With the aid of diagrams, briefly** review the blood supply and circulation in an adult canine long bone. Discuss the effects that implants used for the internal fixation of diaphyseal fractures will have on blood circulation in the bone involved.
2.
 - a. Give an account of the properties and mechanics of failure of 316L stainless steel.
 - b. Discuss the modes of failure of metallic implants.
3. What is osteofascial compartment syndrome? Compare and contrast this syndrome in the dog and man.
4. Evidence Based Medicine was first described fifteen years ago. Discuss its merits and how you believe it can contribute to the management of musculoskeletal disease in dogs and cats.

5. Compare orthopaedic infections in the dog, cat and ox.

THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

MONDAY 9 JULY 2007

PAPER II

(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

Allow 45 minutes per question

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1. Discuss the aetiology, pathogenesis and treatment of congenital elbow luxation in the dog.
 2. Discuss the aetiology and treatment of complications of cemented and uncemented total hip replacement in the dog.
 3. Give an account of the aetiology and management of fractures of the femoral head and neck in the dog, cat and man.
 4. What are the indications for shoulder arthrodesis in the dog? Describe step by step how you would perform this surgery in a 30kg Labrador.
 5. Discuss the options for managing a boisterous 4 year old male Rottweiler weighing 40kg with unilateral pelvic limb lameness related to a partial tear of the ipsilateral cranial cruciate ligament. How would you manage this patient and why?
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

THURSDAY 10 JULY 2008

PAPER I
(3 hours)

Candidates are required to answer **FOUR** of the following five questions.

Allow 45 minutes per question

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1. With reference to the literature:
 - (i) Give an account of the stabilisers of the canine shoulder joint.
 - (ii) Critically evaluate the diagnosis, treatment and prognosis for medial shoulder instability in the dog.
2. **Discuss** the aetiopathogenesis of both acute and chronic spinal cord injury. What cellular repair mechanisms take place to re-establish spinal cord function following injury?
3. **Give a detailed account** of the structure and function of meniscal cartilage. **Discuss** the management of meniscal injuries in the dog and man.
4. **Discuss** the use of perioperative antimicrobials in orthopaedic surgery. Which bacterial pathogens are currently of most concern in multi drug resistant surgical site infections in dogs? How would you manage a multidrug resistant post-surgical wound infection in your clinic?
5. What do you understand by the term 'Slow Acting Drug in Osteoarthritis (SADOA)? **Discuss** the *in vitro* evidence that supports the use of SADOAs for the treatment of osteoarthritis.

DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

THURSDAY 10 JULY 2008

PAPER II

(3 hours)

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1. You have been commissioned to provide technical support in designing a linear external skeletal fixation system for use in small animal orthopaedics. What are the ideal characteristics of the system? Justify your answer with reference to the literature where appropriate.
 2. You are presented with a 5 month-old, entire female Border Terrier showing a 6/10 right thoracic limb lameness with elbow and carpal pain. There is reduced flexion in the carpus. Radiographs confirm a short radius syndrome. The right radius is 1cm shorter than the left with widening of the humero-radial and radio-carpal joint spaces. Assuming there are no other clinical abnormalities, discuss the management options for this patient including consideration of the risks and potential complications.
 3. **Discuss** the aetiology, treatment and prognosis of injuries of the radial carpal bone in dogs. **Use diagrams to illustrate your answers.**
 4. Give an account of how an understanding of spinal biomechanics and stabilisation techniques influence decision making in spinal fracture management.
 5. Give a detailed cited discussion explaining the progression of our understanding of the pathogenesis and treatment of 'medial compartment disease' in elbow dysplasia over the last 30 years. Justify your current treatment of this disease in skeletally immature dogs based on your understanding of the results in the published literature.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

TUESDAY 7 JULY 2009

PAPER I
(3 hours)

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1. Give an account of substitutes for autologous bone graft in orthopaedic surgery.
2. **Discuss** how the biomechanical behaviour of tendons relates to their microscopic and molecular structure. **Briefly discuss** how the anatomy of ligaments differs from tendons.
3. Is osteoarthritis an inflammatory disease? **Discuss** this question in the context of the architectural features of cartilage and the cellular and molecular response seen in osteoarthritis.
4. **Describe** the molecular, biochemical and cellular biology of bone injury and repair. What is the evidence supporting the role of biochemical and cellular manipulation of bone repair?
5. **Review and discuss** the clinical research findings of pet owner questionnaires in canine veterinary orthopaedics.

THE ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA IN SMALL ANIMAL SURGERY (ORTHOPAEDICS)

TUESDAY 7 JULY 2009

PAPER II
(3 hours)

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1. **Discuss** the controversies of treatment of disc-associated cervical spondylomyelopathy.
 2. A seven year-old Flat Coated Retriever is presented to you with a 9/10 pelvic limb lameness and a grossly swollen and painful stifle. Orthogonal radiographs reveal periarticular osteophytosis, generalised soft tissue opacity swelling over the stifle and subtle multi-focal areas of bone lysis affecting the femoral condyles. How would you investigate this case further? **Compare and contrast** synovial cell sarcoma and localised histiocytic sarcoma.
 3. **Give an account** of the recent innovations in implant design used for fracture repair and **discuss the advantages** they may confer.
 4. **Discuss** tibial osteotomy as a treatment for cranial cruciate ligament insufficiency, citing relevant clinical reports and clinical research findings to support your discussion.
 5. **Discuss** the evolution of the surgical management of hip dysplasia in skeletally immature dogs by triple pelvic osteotomy since Schrader's description of the procedure in 1981 up to the current day, highlighting the significant reports that have influenced clinical practice.
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