



**AUSTRALIAN AND NEW ZEALAND  
COLLEGE OF VETERINARY SCIENTISTS  
MEMBERSHIP GUIDELINES**

***Veterinary Sports Medicine and Rehabilitation (Canine)***

**INTRODUCTION**

These Membership Guidelines should be read in conjunction with the *Membership Candidate Handbook*.

**ELIGIBILITY:**

Refer to the *Membership Candidate Handbook*.

**OBJECTIVES**

The Veterinary Sports Medicine and Rehabilitation (VSMR) Chapter of the Australian and New Zealand College of Veterinary Scientists encompasses veterinary practice on both canine and equine athletes, but **Membership is species specific**.

Membership of the College is an official recognition of a veterinarian's knowledge and experience in VSMR. The key objective of Membership in this subject is to demonstrate that the candidate has the ability to integrate technical and academic knowledge into an advanced level of clinical diagnostic ability and practical acumen. Membership is an indication to the profession and the general public of an advanced practitioner, representing a middle-tier of knowledge, competence and experience in VSMR.

As such, the candidates will have sufficient knowledge of, and experience in, the veterinary management of the athletic animal as well as physical rehabilitation of all patients in their chosen species, and the ability to appropriately advise or undertake procedures on behalf of veterinary colleagues, not similarly qualified, on the subject of VSMR.

## LEARNING OUTCOMES

Veterinary Sports Medicine and Rehabilitation requires the application of knowledge drawn from a broad base across body systems and traditional disciplines. The emphasis is placed on a logical, problem-based approach to accurately diagnose and manage the impairments.

A patient may have multiple problems and it is the veterinarian's responsibility to prioritise and deliver the care.

Knowledge of the traditional disciplines of internal medicine, surgery, orthopaedics, clinical pathology, pharmacology, pain management, nutrition, exercise physiology, and diagnostic imaging must all be used to diagnose and treat the problems. An understanding of complementary disciplines including acupuncture, manual therapies and rehabilitation is also important.

The fundamental knowledge component of the examination (Paper 1) covers basic foundation principles of veterinary sports medicine and rehabilitation. The species-specific components of the examination (Paper 2 and the oral examination) cover applied knowledge specific to canine patients.

The following description of topics serves as a guide to the expected level and breadth of knowledge and skill. Both fundamental knowledge and species-specific (canine) knowledge can be obtained from the reading list below. It is the aim of the VSMR Chapter that members are able to successfully pass both the fundamental and species-specific sections of their examination by studying only within their chosen species.

## FUNDAMENTAL LEARNING OUTCOMES

### 1. Tissue-based pathophysiology

1.1. The candidate will have **sound**<sup>1</sup> knowledge of:

1.1.1. Connective tissue biomechanics:

- 1.1.1.1. Muscle
- 1.1.1.2. Tendon
- 1.1.1.3. Ligament
- 1.1.1.4. Bone

1.1.2. Mechanisms of injury and principles of injury and tissue healing for the following specific tissues and systems:

- 1.1.2.1. Cardiovascular
- 1.1.2.2. Respiratory
- 1.1.2.3. Connective tissue
- 1.1.2.4. Musculoskeletal:
  - 1.1.2.4.1. Muscle
  - 1.1.2.4.2. Tendon
  - 1.1.2.4.3. Ligament
  - 1.1.2.4.4. Bone
  - 1.1.2.4.5. Tissues of the joint
  - 1.1.2.4.6. Nervous

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#### <sup>1</sup> Knowledge Levels:

**Sound knowledge** – candidates must know all of the principles of the topic and some of the finer detail and be able to identify areas where opinions may diverge. A middle level of knowledge.

**Basic knowledge** – candidates must know the main points of the topic and the major literature.

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## 2. Kinesiology

2.1. The candidate will have **sound** knowledge of the following:

- 2.1.1. Physical examination
- 2.1.2. Gait analysis
- 2.1.3. Biomechanics
- 2.1.4. Lameness evaluations

## 3. Exercise physiology

3.1. The candidate will have **sound** knowledge of the following related to exercise and performance across species:

- 3.1.1. General conditioning and training principles
- 3.1.2. Energetics
- 3.1.3. Thermoregulation
- 3.1.4. Electrolytes
- 3.1.5. Fluid balance
- 3.1.6. Cardiorespiratory function
- 3.1.7. Nutrition

## 4. Diagnostic imaging

4.1. The candidate will have **basic** knowledge of the principles and applications of the following as they apply to the VSMR patient:

- 4.1.1. Radiology
- 4.1.2. Ultrasonography
- 4.1.3. Nuclear scintigraphy
- 4.1.4. Computed tomography (CT)
- 4.1.5. Magnetic resonance imaging (MRI)
- 4.1.6. Thermography

## 5. Diagnostic methods

5.1. The candidate will have **sound** knowledge of:

5.1.1. Clinical and laboratory measures of musculoskeletal function and dysfunction through the use of:

- 5.1.1.1. Diagnostic local analgesia
- 5.1.1.2. Clinical pathology
- 5.1.1.3. Diagnostic imaging
- 5.1.1.4. Electromyography
- 5.1.1.5. Goniometry
- 5.1.1.6. Girthometry
- 5.1.1.7. Pain scales
- 5.1.1.8. Motion analysis
- 5.1.1.9. Gait analysis systems:
  - 5.1.1.9.1. Force plate
  - 5.1.1.9.2. Pressure mat
- 5.1.1.10. Inertial sensors

5.1.2. Clinical and laboratory measures of neurological function and dysfunction through the use of:

- 5.1.2.1. Clinical pathology
- 5.1.2.2. Diagnostic imaging
- 5.1.2.3. Electromyography
- 5.1.2.4. Pain scales
- 5.1.2.5. Motion analysis
- 5.1.2.6. Inertial sensors

## **6. Nociception and pain mechanisms, pharmacology**

6.1. The candidate will have **sound** knowledge of:

- 6.1.1. Neurophysiology of nociception
- 6.1.2. Pathophysiology of pain
- 6.1.3. Acute pain management:
  - 6.1.3.1. Using pharmacologic methods
  - 6.1.3.2. Using non-pharmacologic methods:
    - 6.1.3.2.1. Nutraceuticals
    - 6.1.3.2.2. Physical modalities
- 6.1.4. Chronic pain management:
  - 6.1.4.1. Using pharmacologic methods
  - 6.1.4.2. Using non-pharmacologic methods:
    - 6.1.4.2.1. Nutraceuticals
    - 6.1.4.2.2. Physical modalities
    - 6.1.4.2.3. Hydrotherapy

## **7. Physical rehabilitation**

7.1. The candidate will have **sound** knowledge of:

- 7.1.1. Manual therapy, including:
  - 7.1.1.1. Manual assessment
  - 7.1.1.2. Massage
  - 7.1.1.3. Stretching
  - 7.1.1.4. Mobilization
- 7.1.2. Physical modalities:
  - 7.1.2.1. Thermal
  - 7.1.2.2. Mechanical
  - 7.1.2.3. Electromagnetic
  - 7.1.2.4. Photobiomodulation
- 7.1.3. Therapeutic exercises for:
  - 7.1.3.1. Flexibility
  - 7.1.3.2. Proprioception
  - 7.1.3.3. Motor control
  - 7.1.3.4. Strength
  - 7.1.3.5. Endurance

## 8. Intra-articular and biologic therapies

8.1. The candidate will have **sound** knowledge of:

8.1.1. Intra-articular medications, including:

8.1.1.1. Hyaluronic acid

8.1.1.2. Corticosteroids

8.1.2. Biologic therapies and their application in VSMR:

8.1.2.1. Gene therapy

8.1.2.2. Stem cell therapy

8.1.2.3. Platelet rich plasma (PRP)

## 9. Surgical considerations in VSMR

9.1. The candidate will have **basic** knowledge of surgical principles and the biological and biomechanical aspects of general, orthopaedic, and neurologic surgery, specifically including:

9.1.1. General principles of fracture fixation

9.1.2. Arthrotomy and arthroscopy

9.1.3. Wound management and soft tissue repair

9.1.4. Biological and physiological features and outcomes of surgery of the spine and peripheral nerves

## 10. Integrative veterinary medicine

10.1. The candidate will have **basic** knowledge of the principles and practice of these fields as they relate to VSMR:

10.1.1. Acupuncture

10.1.2. Chiropractic

10.1.3. Botanicals

## 11. Clinical assessment and communication

11.1. The candidate will have **sound**<sup>2</sup> level of expertise:

11.1.1. Integrate these skills to provide high quality care for patients with the most efficient use of resources in a manner that is responsive to the owner's needs and wishes

11.1.2. Communicate effectively with clients and peers

11.1.3. Recognise when referral to a specialist for additional diagnostic investigations is indicated

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<sup>2</sup> **Skill levels:**

**Sound expertise** — the candidate must be able to perform the technique with a moderate degree of skill and have moderate experience in its application. A middle level of proficiency.

**Basic expertise** — the candidate must be able to perform the technique competently in uncomplicated circumstances

## **CANINE SPORTS MEDICINE AND REHABILITATION LEARNING OUTCOMES**

### **12. Foundational material**

- 12.1. The candidate will have **sound** knowledge of the skills required for daily canine sports medicine and rehabilitation practice including the following:
  - 12.1.1. Physical examination, gait analysis and lameness evaluation
  - 12.1.2. Nociception and pain physiology, pain management, and pharmacology
  - 12.1.3. Nutrition and nutraceuticals
  - 12.1.4. Fundamentals of canine physical conditioning
  - 12.1.5. Training equipment (e.g., harnesses, agility obstacles, jumps)
  - 12.1.6. Assistive devices

### **13. Neuromusculoskeletal system**

- 13.1. The candidate will have **sound** knowledge of common neurologic and musculoskeletal disorders and canine sport-specific injuries
- 13.2. Topics address biomechanics, mechanisms of injury, pathophysiology, principles of tissue healing and repair, and geriatric issues
- 13.3. An understanding of surgical and non-surgical treatment, and prognosis for return to sport following injury is required within the following anatomical regions:
  - 13.3.1. Axial skeletal (head, neck, trunk, pelvis)
  - 13.3.2. Thoracic limb
  - 13.3.3. Pelvic limb

### **14. Medical and surgical issues of the canine athlete**

- 14.1. The candidate will have **sound** knowledge of the anatomy, physiology, pathophysiology, medical diagnosis, and management of commonly seen medical and surgical disorders in canine athletes and working dogs. An understanding of general surgical indications, post-operative care, and prognosis for return to sport following injury is required within the following body systems:
  - 14.1.1. Integumentary
  - 14.1.2. Cardiovascular
  - 14.1.3. Respiratory
  - 14.1.4. Gastrointestinal

### **15. Diagnostic imaging**

- 15.1. The candidate will be able to, with a **basic** level of expertise, interpret diagnostic imaging of the canine athlete across the following modalities:
  - 15.1.1. Radiology
  - 15.1.2. Computed tomography (CT)
  - 15.1.3. Ultrasonography
  - 15.1.4. Nuclear scintigraphy
  - 15.1.5. Magnetic resonance imaging
  - 15.1.6. Thermography

## **16. Physical rehabilitation**

16.1. The candidate will have **sound** knowledge of common techniques for optimising performance and managing common medical and surgical disorders of the canine patient using the following forms of canine rehabilitation:

- 16.1.1. Manual therapies (manual assessment techniques, massage, stretching, tissue mobilization)
- 16.1.2. Physical modalities (thermal, mechanical, electromagnetic, photic, hydro)
- 16.1.3. Therapeutic exercise (proprioception, motor control, strength, flexibility)
- 16.1.4. Application and use of assistive devices (orthotics, prosthetics, carts)

## **17. Biologic therapies**

17.1. The candidate will have **basic** knowledge of the following biologic therapies as they specifically pertain to the canine patient:

- 17.1.1. Canine gene therapy
- 17.1.2. Stem cell therapy
- 17.1.3. Platelet-rich plasma (PRP)

## **18. Ethics, regulatory and legal issues**

18.1. The candidate will have **basic** knowledge of ethical issues related to the status of drug regulations in canine sports medicine and athletic competitions, and interdisciplinary collaborations involving physical therapists, orthotists and trainers.

## **19. Canine sports medicine**

19.1. The candidate will have **sound** knowledge of physiological demands, common injuries and their management across the following canine sport and working dog categories:

- 19.1.1. Canine sport: Racing Greyhounds, Agility, Hunting/Gun Dogs, Field Trial, Flyball, Canicross, Sledding, Dock Jumping, Schutzhund, Earth Dogs, and others
- 19.1.2. Working dogs: Police, Military, Search and Rescue, Therapy, Seeing Eye, Detection

## EXAMINATIONS

For information on the required standard and format for both the Written and Oral examinations, candidates are referred to the *Membership Candidate Handbook*. The Membership examination has **two separate components**:

**1 Written Examination (Component 1).**

**Written Paper 1** (two hours): Principles of Veterinary Sports Medicine and Rehabilitation - This is a common paper for both Canine and Equine candidates.

**Written Paper 2** (two hours): Applied Veterinary Sports Medicine and Rehabilitation – Canine specific paper

**2 Oral Examination (Component 2).**

**Oral** (one hour): Canine specific exam

The written examination will comprise of two, separate two-hour written papers completed on the same day. There will be an additional 15 minutes perusal time for each paper, during which no writing in answer booklets is permitted. Each written paper will contain twenty (20) multiple choice questions (1 mark per question) and the balance in short answer questions worth 100 marks for a total of 120 marks.

**Written Paper 1:**

This paper will assess the fundamental principles of VSMR as described in the Learning Outcomes.

**Written Paper 2:**

This paper will be specific for canine VSMR to test the candidate's familiarity with the current practices and issues that arise from activities within this discipline in Australia and New Zealand.

**Oral Examination – Canine Specific:**

This examination further tests the candidate's achievement of the learning outcomes during a verbal assessment with the Examiners. The duration of the examination is approximately 45- 60 minutes. Images, video clips, radiographs, ultrasound images or clips, clinical pathology results and relevant material are likely to be used during this examination. The aim of the examination is to assess the candidate's diagnostic ability, communication skills, problem solving skills and capability to apply the principles of veterinary practice to clinical scenarios.

Four (4) cases will be presented with supporting questions asked verbally. The oral examination is worth a total of 120 marks with each case allocated 30 marks. The oral examination will be **species specific** for canine.



## RECOMMENDED READING MATERIAL

The candidate is expected to read widely within the discipline, paying particular attention to areas not part of their normal work experiences. This list of books and journals is intended to guide the candidate to some core references and other source material. Candidates also should be guided by their mentors. Due to the broad nature of this examination, it is not expected that the candidate has covered the entire content of these textbooks but should understand the common conditions described therein. *The list is not comprehensive and is not intended as an indicator of the content of the examination.*

### Recommended textbooks<sup>3</sup>

- 1) Zink, C.M. and Van Dyke, J.B. eds., 2018. *Canine Sports Medicine and Rehabilitation*. 2<sup>nd</sup> Edition. John Wiley and Sons.
- 2) Bockstahler B. 2018. *Essential Facts of Physical Medicine, Rehabilitation, and Sports Medicine in Companion Animals*. VBSGroup.eu.

### Additional references<sup>3</sup>

- 1) McGowan, C. and Goff, L. eds., 2019. *Animal Physiotherapy - Assessment, Treatment and Rehabilitation of Animals*. 2<sup>nd</sup> Edition. Blackwell Publishing
- 2) Duerr, F. 2019. *Canine Lameness*. John Wiley and Sons.

### Additional Canine Sports Medicine and Rehabilitation Journals<sup>3</sup>

The veterinary journals listed below contain articles relevant to the field of canine sports medicine and rehabilitation. These are considered non-essential but useful reference material. Candidates are encouraged to have basic knowledge of current publications relevant to this field, but this will not be required to pass the examination:

- *Veterinary and Comparative Orthopaedics and Traumatology*.
- *Veterinary Clinics of North America: Small Animal Practice* - Relevant topics only  
- Rehabilitation and Physical Therapy. *Veterinary Clinics of North America: Small Animal Practice*. Marcellin-Little DJ, Levine D, and Millis DL (editors). January 2015, Volume 45, Issue 1.
- *Frontiers in Veterinary Science*.

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<sup>3</sup> Textbook definitions:

**Recommended textbooks**- candidates should own or have ready access to a copy of the book and a sound knowledge of the contents

**Additional references** – candidates should have access to the book and have basic knowledge of the contents

**Additional Journals** – candidates should be able to access either printed or electronic versions of the journal and have a basic knowledge of the published articles in the subject area.

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## **FURTHER INFORMATION**

For further information contact the College Office

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