



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

MEMBERSHIP GUIDELINES

Zoo Animal Health Management

INTRODUCTION

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

ELIGIBILITY

Refer to Section 2 of the *Membership Candidate Handbook*.

OBJECTIVES

Membership of this chapter is an official recognition of a veterinary surgeon's knowledge and experience in the field of zoo animal health management. 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 a specific area of veterinary practice. The objective of this examination is to demonstrate that the candidate has sufficient knowledge of zoo animal health management to be able to give sound advice in this field to veterinary colleagues.

LEARNING OUTCOMES

Terminology: For the purposes of the ANZCVS Membership in Zoo Animal Health Management, and the Subject Guidelines outlined in this document, ‘zoo animal’ is defined as the mammalian, avian, reptilian, and amphibian taxa maintained in zoos in Australia and New Zealand. Fish and invertebrates are not included.

1. BIOLOGY

The candidate will have **basic**¹ knowledge of:

- a. The taxonomic classification, including phylogenetic groupings, of zoo animals.
- b. The biology of zoo animals, including natural distributions, habitat, diet, reproduction, normal social structure, and population dynamics.
- c. Comparative anatomy and physiology of clinical significance, including commonly used methods for age and sex determination.

2. CONSERVATION

The candidate will have **basic** knowledge of the role of zoos, and of zoo veterinarians, in conservation, including an understanding of captive breeding and release programs and recovery programs.

3. CAPTIVE MANAGEMENT

The candidate will have **sound** knowledge of the captive management and husbandry of zoo animals, including nutrition, reproductive management, hygiene, handling, transportation, enclosure and housing design, enrichment, identification, and record keeping.

4. WELFARE AND ETHICS

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

- a. Animal welfare principles as they apply to zoo animals.
- b. Current approaches for the welfare assessment of zoo animals, including aged animals.

The candidate will have **basic** knowledge of ethical issues that may arise in the management of zoo animals.

5. PREVENTATIVE HEALTH

The candidate will have **sound** knowledge of the components of a comprehensive preventative health program for zoo animals, including: the evaluation and composition of appropriate diets, disease surveillance, parasite management, vaccination, pest control, and biosecurity (including quarantine considerations for regional animal movements).

The candidate will have **basic** knowledge of

- a. The principles of disease risk analysis.
- b. Exotic animal diseases of relevance to zoos in Australia and New Zealand, including considerations for international importations of zoo animals.

¹ Knowledge levels:

Sound knowledge — candidate must know all of the principles of the topic including some of the finer detail, and be able to identify areas where opinions may diverge. A middle level of knowledge.

Basic knowledge — candidate must know the main points of the topic and the major literature

6. MEDICINE AND SURGERY

The candidate will have **sound**¹ knowledge of:

- a. Common diseases of zoo animals, including aetiology, epidemiology, pathogenesis, clinical signs, diagnosis, treatment, control and prevention.
- b. Commonly encountered clinical presentations of zoo animals and demonstrate sound clinical decision making for individual animals and groups.
- c. The collection and interpretation of clinically relevant data, including historical and environmental information, physical examination, and appropriate diagnostics, including diagnostic imaging.
- d. Clinical techniques for the collection of diagnostic samples using best-accepted practice, including blood sampling, crop/gastric lavage, centesis, biopsy, and other appropriate samples for testing for common or significant diseases.
- e. The administration of appropriate therapeutics for common diseases of zoo animals following best-accepted practice, including relevant considerations for drug selection and delivery method.

The candidate will have **basic**¹ knowledge of:

- a. Soft tissue and orthopaedic surgical procedures in zoo animals.
- b. The principles of disease outbreak investigation.

7. PATHOLOGY

The candidate will have **sound** knowledge of the pathology associated with common diseases of zoo animals, with respect to:

- a. Clinical pathology, including appropriate sample collection and the interpretation of:
 - i. Haematology, biochemistry and urinalysis results.
 - ii. Haematological and cytological preparations.
 - iii. Microbiological cultures.
 - iv. Results of relevant antibody, antigen, and molecular tests.
- b. Gross pathology, including appropriate techniques for the post-mortem examination of zoo animals.

The candidate will have **basic** knowledge of the histopathology of common diseases of zoo animals.

8. RESTRAINT AND ANAESTHESIA

The candidate will have **sound** knowledge of methods of capture and restraint in zoo animals – behavioural (e.g. via operant conditioning), physical (including capture equipment, restraint devices, and exhibit design features), and chemical restraint techniques; including:

- a. The relative merits of different restraint techniques in particular scenarios.
- b. The pharmacology and clinical effects of chemical restraint drugs commonly used in zoo animals.
- c. The safe and effective use of commonly used remote drug delivery systems.
- d. Anaesthetic monitoring techniques, and measures to reduce the risk of anaesthetic complications.

9. BEHAVIOUR

The candidate will have **basic** knowledge of:

- a. Normal behaviour of zoo animals and the ability to recognise aberrant behaviour.
- b. Approach to the diagnosis and management of behavioural problems in zoo animals.
- c. The principles of appropriate use of psychotropic medications in zoo animals.

10. OCCUPATIONAL AND PUBLIC SAFETY

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

- a. Zoonotic and reverse zoonotic diseases associated with zoo animals, including their diagnosis and treatment in animals, and their control and prevention in a zoo setting.
- b. The veterinarian's role in the management of dangerous animals in zoos, including animal escapes.

11. COMMUNICATION

The candidate will have **basic** understanding of effective and empathetic communication with keepers, other zoo staff, and members of the public.

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 Examinations** (*Component 1*)
Written Paper 1 (two hours): Principles of zoo animal health management
Written Paper 2 (two hours): Application of the principles of zoo animal health management
2. **Oral Examination** (*Component 2*)
(approximately 45 minutes)

Written Examinations

The two separate two-hour computer-based written papers are taken on the same day. There will be an additional 15 minutes of perusal time for each paper during which notes may be hand-written but no typing is permitted. In each paper there will be four (4) questions to answer, worth 30 marks each, giving a total of 120 marks per paper. All questions must be answered; there is no choice of questions. Each of the four (4) questions may take the form of one long essay question, multi-part questions requiring a series of shorter answers, or a series of multiple-choice questions. Marks allocated to each question (and to each part for multi-part questions) will be clearly indicated on the examination paper.

Written Paper 1:

This paper is designed to test the candidate's knowledge of the principles of Zoo Animal Health Management as described in the Learning Outcomes. Where questions relate to general principles, answers may cite specific examples, but should primarily demonstrate an understanding of the underlying theoretical basis.

Written Paper 2:

This paper is designed to (a) test the candidate's ability to apply the principles of Zoo Animal Health Management to particular cases/problems or tasks and (b) test the candidate's familiarity with the current practices and issues within the discipline of Zoo Animal Health Management in Australia and New Zealand.

Oral Examination:

This examination requires the candidate to demonstrate achievement of the Learning Outcomes through the discussion of case material or relevant scenarios with two examiners via an online video conferencing platform (e.g. Zoom). A series of principal questions are presented sequentially, each question typically comprising a series of parts that relate to different aspects of the presented case/scenario. The number of principal questions will be indicated at the commencement of the oral examination.

The oral examination has a total of 100 marks with each question allocated equal marks. The duration of this examination is approximately forty-five (45) minutes. Questions will be in the form of both short answers and more extended discussions that may include, but are not limited to, case management, techniques and procedures, interpretation of diagnostic findings, and species identification. Questions may have supporting images or information that the candidate will be required to interpret.

RECOMMENDED READING MATERIAL

The candidate is expected to read widely across the scope of the Subject Guidelines. The following is a suggested list of reference material to support the candidate in their preparation for examination. Candidates should seek guidance from their mentor on additional resources and approach to preparation for the exam.

General Zoo Health Management

- Miller RE *et al.* (2015, 2019, 2023). *Fowler's Zoo and Wild Animal Medicine*, volumes 8, 9, and 10. Elsevier.

Australian Mammals

- Vogelnest L, Portas T (2019) *Current Therapy in Medicine of Australian Mammals*. CSIRO Publishing.
- Vogelnest L, Woods R (2008) *Medicine of Australian Mammals*. CSIRO Publishing.

Avian

Comprehensive texts in avian medicine and surgery to complement relevant avian chapters in other reference material listed. For example:

- Speer BL (2016) *Current Therapy in Avian Medicine and Surgery*.
- Doneley B (2016) *Avian medicine and surgery in practice: companion and aviary birds*. CRC press.

Reptiles and Amphibians

Comprehensive texts in reptile and amphibian medicine and surgery, to complement relevant reptile and amphibian chapters in other reference material listed. For example:

- Divers SJ, Stahl SJ (2018) *Mader's Reptile and Amphibian Medicine and Surgery*. Elsevier Health Sciences.
- Doneley B, Monks D, Johnson R, Carmel B, Wiley J (2018) *Reptile medicine and surgery in clinical practice*. Wiley Blackwell.

Chemical Restraint

A good comprehensive text on chemical restraint of zoo animals, outlining general principles and approach to relevant taxa to complement other reference material listed. For example:

- West G, Heard D, Caulkett N (2014) *Zoo Animal and Wildlife Immobilization and Anesthesia*. 2nd Edition. Wiley-Blackwell.

Web-Based Resources

- AUSVETPLAN Enterprise Manual – Zoos
<https://animalhealthaustralia.com.au/ausvetplan/>
- National Zoo Biosecurity Manual
<https://zooaquarium.org.au/public/Public/Animal-Welfare/Biosecurity.aspx>
- Relevant Wildlife Health Australia resources, including Fact Sheets

<https://www.wildlifehealthaustralia.com.au>

- World Association of Zoos and Aquariums resources, including Animal Welfare Strategy
<https://www.waza.org/priorities/animal-welfare/animal-welfare-strategies>

Peer-Reviewed Journals

Candidates are encouraged to deepen their knowledge of important topics and recent developments in zoo animal health management through targeted reading of relevant peer-reviewed articles.

FURTHER INFORMATION

For further information contact The College Office:

Telephone: International +61 (07) 3423 2016

Email: admin@anzcvs.org.au

Web: www.anzcvs.org.au

Postal Address: Building 3, Garden City Office Park, 2404 Logan Road
EIGHT MILE PLAINS QLD 4113 Australia

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