



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

**FELLOWSHIP GUIDELINES**  
*Veterinary Cardiology*

**ELIGIBILITY**

1. The candidate shall meet the eligibility prerequisites for Fellowship outlined in the *Fellowship Candidate Handbook*.
2. Membership of the College must be achieved prior to the Fellowship examination.
3. Membership may be in any discipline.

**OBJECTIVES**

To demonstrate that the candidate has sufficient training, experience, knowledge and accomplishment in Veterinary Cardiology to be recognised as an authority in this field by his/her colleagues in the veterinary profession.

**DESCRIPTION (LEARNING OBJECTIVES)**

The field of cardiology includes the study of all domestic animals. There is no provision for sub-specialisation within the discipline.

A candidate is expected to have sufficient training, knowledge and experience to be recognised by colleagues as a specialist in Veterinary Cardiology.

A candidate for the award of Fellowship in Veterinary Cardiology is expected to have:

- (i) A **detailed**<sup>1</sup> knowledge of the anatomy and physiology of the heart and vascular system with particular reference to all domestic species. In addition the candidate should have a general understanding of cardiac structure and function in non-domestic species.
- (ii) A **detailed** knowledge of the aetiology, pathogenesis and pathophysiology of cardiac dysfunction in all domestic species with particular reference to the dog, cat and horse..

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<sup>1</sup> Knowledge levels:

**Detailed knowledge** — candidates must be able to demonstrate an in-depth knowledge of the topic including differing points of view and published literature. The highest level of knowledge.

**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 core literature.

- (iii) A **detailed** knowledge of diagnostic tests and procedures as these apply to the diagnosis of cardiac disease including a demonstrable skill in the conduct and interpretation of diagnostic imaging as it applies to cardiology.
- (iv) A **detailed** knowledge of the treatment and prevention of cardiac diseases including a comprehensive knowledge of the principles and application of cardiac pharmacology and therapeutics, medicine and surgery of the heart.
- (v) A **detailed** knowledge of comparative cardiac pathology.
- (vi) A **sound** general knowledge of veterinary anatomy, physiology, medicine and pathology especially with regard to respiratory and cardiac function, fluid and ionic homeostasis and autonomic neurology.
- (vii) A **detailed** knowledge of systemic influences on cardiac function, systemic diseases which have implications for the cardiovascular system and extra-cardiovascular manifestations of cardio-vascular disease.
- (viii) A **sound** knowledge of cardiac diseases exotic to Australia and New Zealand.
- (ix) Critically evaluated the current literature and thinking in the field of cardiology.
- (x) A knowledge of current concepts in human cardiology together with their potential application to domestic animals.

## **EXAMINATIONS**

Refer to the *Fellowship Candidate Handbook*.

## **TRAINING PROGRAMS**

Refer to the *Fellowship Candidate Handbook*.

## **TRAINING IN RELATED DISCIPLINES**

Refer to the *Fellowship Candidate Handbook*.

## **EXTERNSHIPS**

Refer to the *Fellowship Candidate Handbook*.

## **ACTIVITY LOG CATEGORIES**

Refer to the *Fellowship Candidate Handbook*.

## RECOMMENDED READING LIST

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, including comparative texts, and other source material. Candidates also should be guided by their supervisor. The list is not comprehensive and is not intended as an indicator of the content of the examination.

## JOURNALS

### General

Relevant subject matter from the following general medicine journals.

1. Journal of the American Veterinary Medicine Association
2. Australian Veterinary Practitioner
3. American Journal of Veterinary Research
4. Journal of the American Animal Hospital Association
5. Journal of Small Animal Practice.
6. Veterinary Clinics of North America
7. Australian Veterinary Journal
8. Compendium of Continuing Education for the Veterinary Practitioner
9. New Zealand Veterinary Journal
10. Journal Veterinary Internal Medicine
11. Contemporary Issues in Small Animal Practice
12. Veterinary Radiology and Ultrasound
13. Equine Veterinary Journal
14. Journal of Equine Medicine and Surgery
15. Equine Veterinary Science
16. Veterinary Record
17. Equine Practitioner
18. Diagnostic Imaging
19. Veterinary Radiology
20. New England Journal of Medicine

### Cardiology Journals

Relevant subject matter from the following cardiology journals.

1. American Journal of Cardiology
2. Journal of the American College of Cardiology
3. American Journal of Physiology
4. Cardiology Clinics
5. Circulation
6. Cardiovascular Clinics
7. British Heart Journal
8. Australian and American Heartworm Society Bulletins
9. American Heart Journal

## TEXT BOOKS

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**Core Texts -General.** Relevant material from the following:

Textbook of Veterinary Internal Medicine. Ettinger SJ (ed), 4th Edn. WB Saunders, Philadelphia, 1994.

Textbook of Medical Physiology. Guyton, 9th Edn. Philadelphia. Saunders

Kirk's Current Veterinary Therapy. 11th Edn. (1992), 12th Edn. (1995). Philadelphia. Saunders.

Large Animal Internal Medicine. Bradford P. Smith (ed), 2nd Edn. Mosby, Philadelphia, 1995.

**Cardiology Texts - Veterinary.**

Canine and Feline Cardiology. Fox PR (ed.) Churchill Livingstone, New York, 1988.

Essentials of Canine and Feline Electrocardiography. Tilley LP (ed). 3rd Edn. Lea and Febinger, St. Louis, 1992.

Equine Cardiology. Patteson. 1st Edn. Blackwell, London. 1996.

Contemporary Issues in Small Animal Practice. vol. 7. Bonagura, JD (Ed) (1987). Cardiology, New York, Churchill, Livingstone.

Bolton's Handbook of Canine and Feline Electrocardiography. Edwards NJ (1987). Philadelphia, Saunders.

Canine Cardiology. (1970) Ettinger, SJ & Suter, PF Philadelphia, Saunders. (now out of print)

Thoracic Radiography. A text atlas of thoracic diseases of the dog and cat. Suter, PF and Lord, PF (1984). Wettswil, Suter.

**Echocardiography**

Echocardiography. 4th edn. Feigenbaum, H (1986). Lea & Febiger, Philadelphia.

**Magnetic Resonance**

Magnetic Resonance Imaging - Principles and Application. Kean D and Smith M. (1986). Hineman, London.

**Cardiac Rhythm**

Principles of cardiac arrhythmias. Chung EK (1971). Williams and Wilkins, Baltimore.

The disorders of cardiac rhythm. Schamroth, L. (19980) Vols. I and II. Blackwell, Oxford.

**Equine**

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Equine Cardiology, Holmes JR. Vol I (1986). Applied anatomy and physiology; The clinical examination; Exercise and the circulation. Vol. II (1987) Electrocardiography. Vol. III (1987) Cardiac murmurs; Cardiac pathology. Vol. IV (1988). Cardiac rhythm. Published by the author.

**Cardiology - Texts - Human.** Relevant material from the following:

Heart Disease: A Textbook of Cardiovascular Medicine. Braunwald (ed). 4th Edn. W.B. Saunders. Philadelphia, 1992.

Principles and Practice of Echocardiography. Weyman (ed). 2nd Edn. Lea and Febiger. Malvern. 1994.

### **Texts for Species Other Than Dogs and Cats**

\*Sisson and Grossman's The Anatomy of the Domestic Animal. Vols. I and II, 5th Edn. Getty, R (1975).

\*The Physiological Basis of Medical Practice. 11th Edn. Best, CH and Taylor, NB (1985). Williams & Wilkins, Baltimore.

\*Duke's Physiology of Domestic Animals. 10th Edn. Svenson, MJ (Editor). (1984) Cornell University Press, Ithaca.

\*Equine Exercise Physiology. Granta, Cambridge.

\*Equine Exercise Physiology 2. Gillespie, JR and Robins, NE (Editors) (1987). ICEEP Publications, Davis, California.

\*Physiology of the Heart. Katz AM (1977) Raven Press, New York.

\*The Pharmacological basis of Therapeutics. 7th edn. Gilman, AG, Goodman, LS, Rall RW and Murad F. (1982). Collier Macmillan, London.

\*Pathology of Domestic Animals. Vol. 3, 3rd edn. Jubb KVF, Kennedy PC and Palmer, N. (1985) Academic Press, London.

\*Systemic Pathology. Vol 1. Symmers, W. St. C. Churchill Livingstone, London.

Comparative Cardiology. Annals, N.Y. Acad. Sci. 127, 1-875. Whipple, HE.

*\*Read relevant Chapters.*

### **Symposia.**

Symposium on Feline Cardiology (May 1977). Editor: Tilley, LP. Vet. Clin.N.Amer. 7 (2), 255.

Symposium on Radiology (May 1982). Editor: Kealy, JK. Vet.Clin.N.Amer. 12 (2) 151.

Symposium on Cardiopulmonary Diagnostic Techniques. (May 1983). Editor: Tilley, LP. Vet.Clin.N.Amer. 13 (2), 199.

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## Specific Articles

The following publications may be consulted to give greater depth in a particular topic:

Cardiac hemangiosarcoma in the dog: a review of 38 cases. Aronsohn, M. (1985) *J. Amer. Anim. Hosp. Ass.* 187,922.

The use of alphablockage in the treatment of congestive heart failure associated with dirofilariasis and mitral valvular incompetence. Atwell, RB (1979). *Vet. Rec.* 104, 114.

Canine parvovirus: a cause of chronic myocardial fibrosis and adolescent congestive heart failure. Atwell, RB & Kelly, WR (1980) *J. Small Anim. Pract.* 21, 609.

Syncopal attacks and sudden death in dogs: mechanisms and etiologies. Beckett, SD, Branch, CB & Robertson RT (1978). *J. Amer. Anim. Hosp. Ass.* 14, 378

Pericardial effusion in the dog: A review of 42 cases. Berg, RJ and Wingfield, W. (1984). *J. Amer. Anim. Hosp. Ass.* 20, 721

Atrial fibrillation in dogs. Bohn, FK, Patterson, DF and Pyle, RL (1971) *Brit. Vet. J.* 127, 485.

Peripheral acquired arteriovenous fistula: a report of four cases and literature review. Bouayad, H. et al (1987) *J. Amer. Anim. Hosp. Ass.* 23, 205.

Angiocardiography. Bonagura, JD, Myer, CW and Pensinger RR, (1982). *Vet. Clin. N. Amer.* 12 (2), 239.

Echocardiographic features of pericardial effusions in dogs. Bonagura, JD & Pipers, FS (1981). *J. Amer. Vet. Med. Ass.* 179, 49.

Diagnosis of cardiac lesions by contrast echocardiography. Bonagura, JD and Pipers, FS (1983). *J. Amer. Vet. Med. Ass.* 182, 396.

Atrial fibrillation in the dog: clinical findings in 81 cases. Bonagura, JD & Ware, WA (1986). *J. Amer. Anim. Hosp. Ass.* 22, 111.

Patent ductus arteriosus and persistent right aortic arch surgery in dogs. Buchanan, JW (1968). *J. Small Anim. Pract.* 9, 409.

Dilated congestive cardiomyopathy in Doberman Pinschers. Calvert, CA (1986) *Comp. Cont. Ed. Pract. Vet.* 8, 417.

Heartworm disease in dogs with particular reference to a protocol for treatment. Carlisle, CH (1980) In *Veterinary Annual*, ed. Grunsell, CSG, & Hill, FWG, Bristol, Wright.

The interpretation of electrocardiograms in small animals. Darke, PGG (1974). *J. Small Anim. Pract.* 15, 537.

Therapy for cardiac failure in small animals. Darke, PGG (1984). *Vet. Rec.* 115, 329.

Myocardial disease in small animals. Darke, PGG (1985). *Br. Vet. J.* 141, 342.

- Congenital heart defects in small animals. Darke, PGG (1986) Br.vet.J. 142, 203.
- Pacemakers in Canine heartblock. Darke, PGG (1987) In The Veterinary Annual, 27th Ed. Grunsell, CSG, Hill, FWG and Raw, ME, Bristol Scientifica.
- Congestive heart failure in dogs: therapeutic concepts. Detweiler, DK & Knight DH (1977). J.Amer.Vet.Med.Ass. 171, 106.
- Abnormal heart sounds and murmurs of the dog. Detweiler, DK and Patterson, DF (1967). J.Small.Anim.Pract. 8, 193.
- Idiopathic cardiomyopathy in the dog. Ettinger, SJ, Bolton, GR & Lord, PF (1970). J.Amer.Vet.Med.Ass. 156, 1225.
- Patent ductus arteriosus in the dog: characteristics of occurrence and results of surgery in one hundred consecutive cases. Eyster, SJ et al (1976). J.Amer.Vet.Med.Ass. 168,435.
- Pulmonic stenosis in the dog: 29 cases. Fingland, RB, Bonagura, JD & Myer, CW (1986). J.Amer.Vet.Med.Ass. 189,218.
- Congenital cardiovascular abnormalities in the dog. Fisher, EW (1972). In Veterinary Annual 13th Edn. Ed. Grunsell, CSG & Hill, FWG, Bristol, Wright.
- Feline aortic thromboembolism. Flanders, JA (1986). Comp.Cont.Ed.Pract.Vet. 8,473.
- Idiopathic pericardial haemorrhage in dogs: a report of 14 cases. Gibbs, C. et al. (1982). J.Small.Anim.Pract. 23, 483.
- Outcome from cardiopulmonary resuscitation in cats: laboratory and clinical experience. Gilroy, BA, Dunlop BJ & Shapira, HM (1987). J.Amer.Anim.Hosp.Ass. 23, 133
- A cardiomyopathy in the English Cocker Spaniel: a clinicopathological investigation. Gooding, JP et al. (1982) J.Small.Anim.Pract. 23, 133.
- New ideas in the management of heart failure in dogs. Hamlin, RL (1977) J.Amer.Vet.Med.Ass. 171, 114.
- Clinical experience with hydralazine for treatment of otherwise intractable cough in dogs with apparent left-side heart failure. Hamlin, RL & Kittleson, MD (1982). J.Amer.Vet.Med.Ass. 180, 1327.
- Sudden death in young dogs with myocarditis caused by parvovirus. Hayes, MA Russell, RC & Babiuk, LA (1979). J.Amer.Vet.Med.Ass. 174, 1197.
- Cardiac arrhythmias in the dog: detection and treatment. Hilwig, RW (1975). J.Amer.Vet.Med.Ass. 169,789.
- Conversion of atrial fibrillation in two dogs using verapamil and supportive therapy. Johnson, JT (1985). J.Amer.Anim.Hosp.Ass. 21, 429.
- Oral hydralazine therapy for chronic mitral regurgitation in the dog. Kittleson, MD et al (1983) J.Amer.Vet.Med.Ass. 182, 1205.

Myocardial function in small dogs with chronic mitral regurgitation and severe congestive heart failure. Kittleson, ME et al (1984). *J.Amer.Vet.Med.Ass.* 184, 455.

Efficacy of digoxin administration in dogs with idiopathic congestive cardiomyopathy. Kittleson, MD et al (1985). *J.Amer.Vet.Med.Ass.* 186, 162.

Technique and postoperative management for successful cardiopulmonary bypass and open-heart surgery in dogs. Klement, P et al (1987) *J.Amer.Vet.Med.Ass.* 190, 869.

Cyanosis: Physiology and pathogenesis Krotje, LJ (1987) *Comp.Cont.Ed.Pract.Vet.* 9, 271

Pathology of feline heart disease. Liu, SK (1977) *Vet.Clin.N.Amer.* 7, (2), 323.

Canine hypertrophic cardiomyopathy. Liu, SK, Maron, BJ & Tilley, LP (1979) *J.Amer.Vet.Med.Ass.* 174, 708.

Congestive heart failure in the cat. Liu, SK, Tashjian, RJ, & Patnaik, AK (1970) *J.Amer.Vet.Med.Ass.* 156, 1319.

Echocardiographic and clinical signs of canine dilated cardiomyopathy. Lombard, CW (1984) *J.Small.Anim.Pract.* 25, 59.

Normal values of the canine M-Mode echocardiogram. Lombard, CW (1984) *Amer.J.Vet.Res.* 45, 2015.

Vegetative bacterial endocarditis in dogs: echocardiographic diagnosis and clinical signs. Lombard, CW & Buergelt, CD (1983) *J.Small.Anim.Pract.*, 24, 325.

Pacemaker implantation in the dog: survey and literature review. Lombard, CW, Tilley, LP & Yoshioka, M (1981) *J.Amer.Anim.Hosp.Ass.* 17, 751.

Radiographic and hemodynamic evaluation of cardiomyopathy and thromboembolism in the cat. Lord, PF et al (1974) *J.Amer.Vet.Med.Ass.* 164, 154.

Cardiac arrhythmias associated with multiple trauma in dogs. Macintire, DK & Snider, TG (1984) *J.Amer.Vet.Med.Ass.* 184, 541.

The use of vasodilators in treatment of congestive heart failure in dogs: a review. McIntosh, JJ (1981). *J.Amer.Anim.Hosp.Ass.* 17, 255.

Clinical pharmacodynamics and pharmacokinetics of beta-adrenergic blocking drugs in veterinary medicine. Muir, WW (1984) *Comp.Cont.Ed.Pract.Vet.* 6, 156.

Treatment of cardiac arrhythmia in dogs with gastric distention-volvulus. Muir, WW & Bonagura, JD (1984) *J.Amer.Vet.Med.Ass.* 184, 1366.

Bacterial endocarditis in the dog. Murdoch DB, & Baker, JB (1977). *J.Small.Anim.Pract.* 18, 687.

Quantitative cross-sectional echocardiography in the normal dog. O'Grady, MR et al (1986) *Vet.Radiol.* 27, 34

Canine congenital heart disease: epidemiology and etiological hypotheses. Patterson, DF (1971). *J.Small Anim.Pract.* 12, 263.



Spontaneous abnormal cardiac arrhythmias and conduction disturbances in the dog. Patterson, DF et al (1961) *Amer.J.Vet.Res.* 22, 355.

Malignant haemangioendothelioma (angiosarcoma) in the dog. Pearson, GT & Head KW (1976). *J.Small Anim.Pract.* 17, 737.

Feline hyperthyroidism: Pretreatment clinical and laboratory evaluation of 131 cases. Peterson, ME et al (1983). *J.Amer.Vet.Med.Ass.* 183, 103.

Clinical use of echocardiography in the domestic cat. Pipers, FS & Hamlin, RL (1980) *J.Amer.Vet.Med.Ass.* 176, 57.

Endocarditis of the aortic valve in the dog. Sisson, D & Thomas, WP (1984). *J.Amer.Vet.Med.Ass.* 184, 570.

A critical evaluation of the radiographic findings in canine cardiovascular diseases. Suter, PF & Lord, PF (1971). *J.Amer.Vet.Med.Ass.* 158, 358.

Constrictive pericardial disease in the dog. Thomas, WP et al (1984). *J.Amer.Vet.Med.Ass.* 184, 546.

Simple radiography as an aid to the diagnosis of heart disease in the dog. Wyburn, RS & Lawson, DD (1967). *J.Small.Anim.Pract.* 8, 163.

## **FURTHER INFORMATION**

For further information contact the College Office

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