

Diploma in Veterinary Cardiology

Please view the general documents to obtain copies of:

- B1:** Guidance Notes for candidates on general requirements.
- B3:** General Guidance Notes on preparation for a Dissertation.
- E1:** Application form E.1 - for enrolment and initial approval of experience.
- H:** Role of Advisers to Certificate Candidates.

The following papers are attached:

- B2:** Specific requirements for the Diplomas.
- C:** Syllabus and Commentary for the Diplomas.
- D:** Reading List.
- E:** Application forms E.1a, E.2
 - E.1(a)** - for specific details of practice/centre
 - E.2** - for final approval of experience and for permission to submit an entry to the examination
- F:** List of Advisers.

A copy of the most recent Examination Question Paper is enclosed for your information.

B.2—2012

The Diploma in Veterinary Cardiology

Specific Guidance notes for Candidates

[These notes must be read in conjunction with the B1 General Guidance Notes to Candidates]

Membership of the Royal College of Veterinary Surgeons

1. It is not a requirement of the Veterinary Cardiology Board that candidates entering for the Diploma are Members of the Royal College of Veterinary Surgeons (MRCVS), although they will need to hold an approved veterinary qualification.

Specific Experience

2. The Board has discretion to increase the requirements for experience for any candidate above the minimum specified if it is considered to benefit the candidate.
3. Experience accepted for the Certificate will count towards the experience required for the Diploma, at the discretion of the Board, whether the candidate is at an approved centre or an approved practice.

Approved Centre Route

4. Candidates following an approved training programme at an approved centre will not be permitted to enter for the examination until they have been Members of the College or held an approved veterinary qualification **for at least four years**. They are required to offer experience in the subject **over at least four years**.
5. **Applications for approval of a Centre must be made directly by the Centre to the RCVS and not by the candidate. An application form can be obtained from the RCVS.**

Approved Practice Route

6. Candidates following the approved practice route will not be permitted to enter for the examination until they have been Members of the College or held an approved veterinary qualification for **at least five years**. Candidates are required to offer experience in the subject over **at least five years including 200 days spent in blocks of a minimum of one week at a time in an approved centre**. Candidates should note that 10% of this time should be spent with less familiar species.
7. **There is no separate application form other than the candidate applications Forms included with this Information Pack. Practices are approved for each individual candidate.**

All Diploma applicants must include the following in their application for enrolment:

8. Name of a suitably qualified and accessible advisor, with a supporting letter from the advisor confirming that they are willing and able to support the candidate through the extended period of study towards the DVC.
9. A statement by the applicant demonstrating an understanding of the difficulties and challenges that they may face in pursuing the DVC from private practice and the level of commitment required to achieve this higher qualification.
10. A detailed study plan proposal. This should describe in detail how/ when/ where they intend to achieve the 200 day minimum experience requirement, including a breakdown of day count for each year. Candidates are reminded that 200 days is a MINIMUM requirement and additional experience is recommended.

The study plan should also include the following details:

- Type of institution where the supervised time will be spent (ie. University / private referral practice; in the UK /abroad)
 - Species (i.e. small animal, large animal, human cardiology)
 - Plans for gaining experience of cardiac interventions
 - Plans for gaining exposure to critical case review, journal review, discussion of clinical trial design and statistical methodology
 - Plans for attendance at CPD events and national or international conferences.
11. Detail of the planned research project. Although the specific title does not need to be finalised at the time of application, the following details should be provided:
 - How the proposed research project will be achievable from practice
 - Source of research funding
 - How time spent conducting the clinical research project will be incorporated into the timetable of the proposed study plan.

Final Approval of Experience

8. Candidates will need to submit an outline of the submitted work together with proposed titles to the Board either with their application for initial or final approval of experience.

The Examination

9. The examination consists of three Sections:
 - a. A Dissertation OR 2 Published Papers,
 - b. TWO x 3 hour written papers, and
 - c. a clinical, oral, and practical examination.

Submitted Work for Examination

10. Candidates will need to submit either a dissertation or two published papers for Section (a) of the examination. Candidates are advised that the standard and volume of work represented by a dissertation or two published papers, where the candidate is the principal author, should be viewed as broadly equivalent.

Dissertation

11. Candidates are required to submit a dissertation as part of the Diploma examination. The subject proposed by the candidate must receive prior approval by the Board (see paragraph 8 above) and each application must be accompanied by a brief summary of the aims of the project and the proposed methods to be used to achieve such aims. The subject should be relatively narrow to allow detailed and in-depth assessment within the word-limit. The work should be clinically relevant and contain original work or thought, and include a concise but well-researched literature review. The dissertation should be in a format similar to that required for other post-graduate qualifications and **three copies**, typed and bound (or presented in a secure cover) are required.
12. Candidates will need to include a **declaration** (see template at back of B1 Guidance Notes) at the front of the dissertation.
13. The Board advises that where more than two years has elapsed between the candidate submitting the dissertation and sitting the Diploma examination, the literature review of the dissertation should be revised by the inclusion of an addendum to reflect relevant recent developments in the field.
14. **Candidates are asked to submit an electronic version of their submitted work together with their hard copy.** This will be retained at RCVS unless requested by the examiners for purposes such as checking the word count. The electronic version should be Microsoft Office 2000 or XP compatible and should be submitted either on CD or floppy disc/s. Please ensure that the disks are easily identifiable by placing them in an envelope with your name, subject and 'Electronic version of submitted work' marked clearly on the front.

Word Count

15. The dissertation should be between **5,000–10,000 words** not including references and figures. A word count must be shown on the front cover of the Dissertation.

Two Published Papers

16. Candidates are alternatively required to submit as part of the Diploma examination two principal author papers that have **not previously** been submitted for another RCVS post-graduate qualification. The papers' subjects should be in a related area and form a coherent area of work. The subject proposed by the candidate **must receive prior approval by the Board** and each application must be accompanied by a brief summary. The work should be clinically relevant and contain original work or thought and should either be published in or accepted for publication by a refereed journal.
17. **Three copies, in a secure cover are required.**
18. The following statements should be included at the front of each copy of the published papers.
 - a. ***Published papers submitted in part fulfilment of the requirements for the RCVS Diploma in.....by (name of candidate).***
 - b. ***Acknowledgements are due to: name.....for (description of assistance given).***
These papers have not been submitted for another RCVS qualification.
19. Candidates may **not** use all or part of the work prepared and submitted for another postgraduate qualification, including the RCVS Diploma of Fellowship, as all or part of their submitted work for an RCVS Diploma. However, publications in peer reviewed journals **arising from** any postgraduate degree, for example, a PhD or Masters thesis could be used towards a subsequent Diploma if publications of this type form part of the Diploma requirements and are appropriate to the discipline.

Grading Scheme

20. The submitted work will be graded "Good Pass", "Pass", or "Fail".
 - **Good Pass** (60% or over)—the work will be lodged in the RCVS Library as a suitable example for future candidates.
 - **Pass (defined as 50%)**—The work is adequate to enable the candidate to proceed to the remaining sections of the examination, but the submitted work may need to be revised by the date of the clinical, oral and practical for lodging in the Library if the candidate is successful in the examination as a whole.
 - **Fail (below 50%)**—the work is not adequate to enable a candidate to proceed to the remaining sections of the examination for the year in question.

Written Examination

21. Candidates are warned that answers should be given specifically and that illegible handwriting may result in examiners being unable to award marks for information that candidates intended to convey. In addition, the Examiners will take into consideration spelling and whether or not the question has been answered in the form requested.

Format

22. The written examination will consist of two 3-hour papers, each containing five questions requiring essay-type answers. Four questions on each paper should be answered. **Paper 1** will contain questions on the basic sciences (including the clinical application of relevant areas) and **Paper 2** will be on the clinical sciences.

Marks Scheme

23. **Paper I**—will be marked out of 50 marks
Paper II—will be marked out of 50 marks
Total Mark for this Section (b) = 100 marks

Clinical, Oral and Practical Examination

General Format

24. The clinical and practical parts of the examination will last up to four hours in total.
25. The oral examination will last up to one hour and will be compulsory.

Marks Scheme

26. The Clinical examination will be marked out of **60 marks**.
The Practical examination will be marked out of **40 marks**.
The Oral will act as a compulsory moderating exam, with a PASS/FAIL mark awarded.

TOTAL Mark for this Section (c) = 100 marks

Syllabus and Reading List

27. A syllabus, with a brief commentary, and reading lists for the Certificates are provided for reference. There are no separate reading lists for the Diplomas as candidates at this level are expected to be familiar with all literature in the area of their elective and most particularly so in the topic of their dissertation or submitted papers.
28. Candidates should note that the Certificate Reading List was frozen in 2002 and will eventually be withdrawn.

Advisers

29. Candidates are advised to look in the RCVS Register of Members for the lists of Diplomates or RCVS Recognised Specialists in Veterinary Cardiology. Candidates should take the initiative in contacting their adviser, and in travelling to meet him/her should this be appropriate.

Abbreviation for Qualification

30. Successful candidates are permitted to use the abbreviation "DVC" after their names, in the RCVS Register of Members, and on practice plates and stationery.

Revised Feb96/ Apr97/ Dec98/ Nov00/ Jan02/ Mar03/March 2005/Jan 2012

B3

General Guidance Notes for Diploma Candidates on the Preparation of a Dissertation

The dissertation should be presented in the normal format for a scientific article unless there are strong reasons why this is not appropriate: the supervisor should approve any different format before the first draft is produced.

The normal sections are:

Introduction

This should include a brief review of the literature on the subject giving appropriate references. References may be cited in one of two ways e.g. 'Smith and Brown (1993) found that parasites increased in July' or 'Previous studies have shown that parasites increased in July (Smith and Brown, 1993)'.

It should be a critical review to indicate what is already known and where the gaps are in our knowledge, which you have set out to remove. At the end of the introduction, it should be possible to say 'In the light of the literature I have reviewed, the aims of this study are to plug the following gaps by carrying out the following work' or something to the same effect!

Materials and Methods

This should include an account of the animals or flocks or specimens used and the experimental methods and techniques you have used in order to obtain your results. There is no need to give details of well-known techniques but it is important that a reader should be able to repeat the work and certainly be able to decide on the reliability of your techniques, which obviously affect the value of your results. If you use techniques developed by other people, you should refer to a book or journal where the details are published.

Results

There should be a logical description of what you have found by the techniques you have described. This section may benefit by the inclusion of tables, graphs, figures or photographs which should have captions which are sufficiently self-explanatory to stand alone, though they should also be referred to in the appropriate part of the text. This section should not contain any comments on the significance of the results or to any inconsistencies or problems encountered.

Discussion

This section should contain a critical discussion of the significance of the results and of the extent to which the aims described in the introduction have been achieved. It should also relate the new findings to previous work and it may therefore be necessary to quote again some of the papers cited in the introduction but for a different purpose. In the introduction, it was to show where the gaps were, here it is to show how your results agree, disagree or add to the previous work. Any conclusions or new ways of tackling the problem should be indicated here.

References

Unfortunately, there are a number of different ways used by different journals to list references in this list, so it isn't possible to lay down the one correct way! Since you might also wish to write your work as a paper for a journal, however, it is best to use a style which can be adapted to any journal, which means that the reference should be cited in full as follows:

Smith, M. J. and Jones, W. B. (1993). The seasonal fluctuations in parasite numbers in sheep in Britain. *Veterinary Record*, 134, 123 - 134.

A very careful check should be made to ensure that the references in the text are exactly the same as those in the list. (Trying this out on articles in any journal will give you a good idea as to the care with which the articles are edited by the authors or the journal).

Acknowledgments

This section gives you the opportunity to thank anyone who has helped with the work or the dissertation.

Appendices

If there is a great deal of detailed data such as laboratory findings, it may be helpful to place most of it in appendices with only summaries such as mean values in the results section.

C

Commentary and Syllabus for the Diploma in Veterinary Cardiology

Commentary

1. A sound general knowledge of veterinary anatomy, physiology, medicine, and pathology will be assumed, with particular reference to respiratory and cardiac function, fluid, and ionic homeostasis and autonomic neurology.
2. It will be assumed that candidates have experience of the diagnosis and management of cardiovascular disorders encountered in any of the common domesticated species of which the dog, cat, and horse are the major examples. Knowledge of cardiovascular disorders in other mammalian species is required, but candidates will not be expected to be clinically experienced in all species. Detailed interpretation of electrocardiography in domesticated species and of cardiovascular radiology in the dog and cat will be required. A systematic approach to case appraisal and recording will be expected.
3. Knowledge of modern attitudes and developments in human cardiovascular diagnosis and therapy will be expected, together with concepts of potential applications to domesticated animals.
4. The accompanying syllabus serves as a guide to the subject. It is similar to the syllabus for the Certificate in Veterinary Cardiology. However, a greater depth of knowledge in one or more of the common domesticated species is expected, together with an extension into other species of importance in veterinary medicine. More extensive knowledge of cardiovascular physiology, pharmacology, pathology and comparative cardiology will be required.

Syllabus

A. Anatomy of the Cardiovascular System

1. Developmental

- genesis of the main congenital deformities
- neonatal adjustments in the circulation, and the way that these may lead to defects
- haemodynamic effects of congenital lesions
- potential inheritance of developmental and congenital abnormalities

2. Structural

- gross anatomy of the heart and great vessels
- cardiac conduction system and autonomic nerve supply, including comparative aspects
- histological and ultrastructural anatomy of cardiovascular tissues

B. Cardiovascular Physiology

- components of the cardiac cycle and its mechanical events
- myocardial activation and electrophysiology
- the regulation and control of the cardiovascular system
- effect of exercise/haemorrhage/metabolic disturbances
- blood gases, fluid and acid-base balance and their controls
- haemopoiesis and coagulation
- species variations, e.g. activation sequence (Purkinje system)

C. Cardiovascular Disease

1. General incidence of cardiovascular disease and its clinical importance in dogs, cats, cattle, horses and other species insofar as cardiovascular disease may be clinically relevant.

2. Pathology

Candidates will be expected to be able to carry out a systematic post-mortem examination of the heart in any of the domesticated species and to interpret gross cardiovascular findings in other species, with particular reference to the following —

- pericardial diseases (including effusions)
- myocardial disease, e.g. myocarditis, fibrosis, fibroelastosis, cardiomyopathy, congenital disorders
- valvular dysplasias, deformities, endocarditis, endocardiosis
- cardiac neoplasia, primary (such as haemangiosarcoma and heart base tumours) and secondary (such as lymphosarcoma)
- vascular disorders, e.g. congenital shunts, arteriovenous fistulae, portosystemic anastomoses, vasculitis, thrombosis, infarction
- cardiovascular parasites
- pathological effects of cardiovascular disease (e.g. congestion and hypoxia) on other organs and systems (e.g. liver and lungs)

Knowledge of common histopathological changes is expected.

3. Cardiac Failure

- (a) Mechanisms involved in
- (i) Myocardial (pump or output) failure
 - (ii) Pressure overload
 - (iii) Volume overload
 - (iv) Compliance failure

- (b) Generation of fluid retention and development of congestive cardiac failure. Comparative variations in clinical signs of cardiac failure in the common domesticated species.
- (c) Aetiology of exercise intolerance, syncope and of cardiac arrest in companion animals.
- (d) 'Shock', its generation and consequences.

4. Congenital and developmental disease

- knowledge of lesions in general and details in one or more of the common domesticated species
- course of clinical signs

5. Functional disturbances

- e.g. arrhythmias, haemic murmurs, autonomic disturbances
- possible pathogenesis and clinical implications

6. Cardiac murmurs

- source, generation and clinical implications in the common domesticated species

7. Cardiac arrhythmias

- aetiology: extrinsic factors, myocardial disease, idiopathic
- mechanisms for genesis of arrhythmias
- interpretation and significance
- haemodynamic effects

8. Extra-cardiovascular diseases

Their effects on the cardiovascular system and clinical implications

- electrolyte disturbances
- shock, hypoxia, anaemia
- endocrine disturbances
- respiratory disease
- hepatic and renal failure
- neurological disturbances
- vascular compression/occlusion

D. Clinical examination of the cardiovascular systems - of dogs, cats, horses and cattle. In working and performance animals, assessment of the cardiovascular system and exercise tolerance. It is not anticipated that candidates will be as proficient in diagnosing clinical

disturbances in all species as in selected species, but the disorders and their clinical implications should be understood.

1. Auscultation
 - audibility of heart sounds and influences on this
 - abnormal cardiac sounds and murmurs, their characterisation and localisation
2. Pulse
 - rate, character, waveform and rhythm
3. Mucous membranes — assessment
4. Blood pressure measurement (direct and indirect)
5. Extra-cardiovascular manifestations of cardiovascular disease
6. Electrocardiography
 - principles of function of the equipment and an understanding of its basic mechanisms
 - generation of the cardiac electric field and its assessment by lead systems
 - rate, rhythm, waveform — general principles of interpretation
 - Vectorcardiography
 - comparative aspects — characteristics of ECGs in horses, cattle, dogs and cats
 - evaluation, diagnosis and significance of complex arrhythmias
 - recognition of specific abnormal waveforms
 - specialised diagnostic techniques (endocardial ECG, 24 hour ambulatory ECG systems, radiotelemetry)
7. Radiology
 - detailed radiographic anatomy of the cardiovascular system in small animals
 - knowledge of the value and limitations of radiography in large animals
 - radiographic changes in other organs associated with cardiovascular disease
 - the use of fluoroscopy (for angiography, catheterisation, pericardial disease)
 - angiography (details and practice)
8. Detailed knowledge, practice and experience in Echocardiography and Doppler; use of contrast materials.
9. Principles of cardiac catheterisation—blood pressures, blood gases, angiography, endomyocardial biopsy.
10. Principles of radionuclide imaging.
11. Phonocardiography principles and interpretation.
12. Laboratory findings in cardiovascular disease.

E. Cardiovascular Therapeutics

— some knowledge of pharmacokinetics and mode of action is required.

- (a) General management of animals in heart failure
- (b) Surgical procedures for cardiovascular disease in domesticated animals (including cardiac by-pass, pacemakers pericardiocentesis, balloon angioplasty).
- (c) Diuretic therapy — uses and abuses
- (d) Drugs of benefit in myocardial failure (including positive and negative inotropes)
- (e) Drugs of benefit in volume or pressure overload (small animals)
- (f) Drugs alleviating overcompensation of neurohumoral axis in heart failure (e.g. angiotensin-converting enzyme inhibitors)
- (g) Bronchodilators
- (h) Anti-arrhythmic agents
- (i) Effect of fluid therapy, anaesthetic agents and other drugs on cardiovascular system
- (j) Anticoagulants (small animals and horses)
- (k) Cardiopulmonary resuscitation — principles and practice in small animals
- (l) Other cardiovascular therapy, e.g. for endocarditis, aortic thrombosis (dogs, cats and horses)

Knowledge of the detailed applications of cardiovascular drugs for the species in which they are commonly used is required. It is accepted that knowledge may be limited in other species.

November 1987 Revised Nov89/Nov93/Nov96/Nov97/Jan 02/January 03

*Prepared by Professor M J Clarkson
April 1997*

D

Reading/Reference List

Candidates should note that the reading lists for the Certificate and Diploma in Veterinary Cardiology was frozen in 2002 and will eventually be withdrawn. Candidates are expected to research the literature for themselves and are recommended to make use of the RCVS Library and Information Service for this purpose (<http://www.rcvslibrary.org.uk/>, e-mail library@rcvs.org.uk or telephone 020 7222 2021). Candidates should also seek advice on suitable reading matter from their advisers.

Candidates may wish to refer to the RCVS Certificate in Veterinary Cardiology Reading/Reference list also.

A. Recent Publications

Candidates should be familiar with most recently published work in human and veterinary cardiology and regular perusal of the following journals is advised:

Veterinary

American Journal of Veterinary Research, Equine Veterinary Education, Equine Veterinary Journal, Journal of the American Animal Hospital Association, Journal of Veterinary Internal Medicine, Journal of the American Veterinary Medical Association, Journal of Small Animal Practice, Research in Veterinary Science, Veterinary Radiology and Ultrasound, Veterinary Record, Journal of Veterinary Cardiology.

Human

American Heart Journal, American Journal of Cardiology, Circulation, European Heart Journal, Heart, Journal of the American College of Cardiology, New England Journal of Medicine

B. Textbooks

The following textbooks are useful and may provide a basis for literature searches on specific subjects.

Veterinary Cardiology

Textbook of Veterinary Internal Medicine. 1999. Ed. S.J. Ettinger & E.C. Feldman. 5th edition. W.B. Saunders, Philadelphia. Section IX. The Cardiovascular system. In volume 1. Appropriate chapters.

Fox, P.R., Sisson, D. and Moise, N.S., (1999) Textbook of Canine and Feline Cardiology (2nd edition), W.B. Saunders, Philadelphia

Kittleson, M.D. and Kienle, R.D. (1998), Small Animal Cardiovascular Medicine, Mosby, St Louis

Current Veterinary Therapy X. 1989. Ed. R.W. Kirk. W.B. Saunders, Philadelphia. Section 3. Cardiopulmonary disease. J.D. Bonagura (section editor). Appropriate chapters.

Kirk's Current Veterinary Therapy XI. 1992. Ed. R.W. Kirk & J.D. Bonagura. W.B. Saunders, Philadelphia. Section 9. Cardiopulmonary disease. B.W. Keene (section editor). Appropriate chapters.

Kirk's Current Veterinary Therapy XII. 1995. Ed. J.D. Bonagura. W.B. Saunders, Philadelphia. Section 9. Cardiopulmonary disease. B.W. Keene (section editor). Appropriate chapters.

Kirk's Current Veterinary Therapy XIII. 2000. Ed. J.D. Bonagura. W.B. Saunders, Philadelphia. Section 9. Cardiopulmonary diseases. B.W. Keene and L.B. Lehmkuhl

Ettinger, S.J. & Suter, P.F. (1970). Canine Cardiology. W.B Saunders, Philadelphia. (*Out of print, but still useful e.g. for cardioangiography*).

Holmes, J.R. Equine Cardiology. (Published by the author).

Volume I (1986). Applied Anatomy and Physiology; The Clinical Examination; Exercise and the Circulation.

Volume II (1987). Electrocardiography.

Volume III (1987). Cardiac Murmurs; Cardiac Pathology

Volume IV (1988). Cardiac Rhythm.

Miller, M.S. & Tilley, L.P. (1995). Manual of Small Animal Cardiology. 2nd edition. W.B Saunders, Philadelphia.

Patteson, M. (1996) Equine cardiology. Blackwell Science, Oxford.

J.D. Bonagura (Guest Editor) (1985). Cardiology. *Veterinary Clinics of North America. Equine Practice* 1; Number 2.

Human Cardiology

Braunwald, E. (1997 or 2001). Heart Disease. A Textbook of Cardiovascular Medicine. 5th edition or 6th edition. W. B. Saunders, Philadelphia.

Anatomy

Getty, R. (1975). Sisson and Grossman's The Anatomy of the Domestic Animals. Volumes 1 & 2. 5th edition. W.B. Saunders, Philadelphia. Appropriate chapters.

Embryology

Noden, D.M. & DeLahunta, A. (1985). The Embryology of Domestic Animals. Developmental Mechanisms and Malformations.

Chapter 11: Cardiovascular System I: Blood and arteries.

Chapter 12: Cardiovascular System II: Heart

Chapter 13: Cardiovascular System III: Venous system and lymphatics.

Physiology

Dukes' Physiology of Domestic Animals. 1984. 10th edition. Ed. M.J. Svenson.
Cornell University Press, Ithaca. New edition.

King, A.S. (1999). The Cardiorespiratory System, Integration of Normal and Pathological Structure and Function. Blackwells, Oxford.

Katz, A.M. (2001). Physiology of the heart. Lippincott Williams and Wilkins, Philadelphia.

Levick, J.R. (1995). An Introduction to Cardiovascular Physiology. 2nd Edition. Butterworth-Heinemann, Oxford.

Opie, L.H. (1998). The Heart. Physiology & Metabolism. 2nd edition. Raven Press, New York.

Gillespie, J.R. & Robinson, N.E. (1987). Equine Exercise Physiology 2. ICEEP Publications, Davis, California.

Snow, D.H., Persson, S.G.B. & Rose, R.J. (1983). Equine Exercise Physiology. Granta, Cambridge.

Pharmacology & Therapeutics

Goodman & Gilman's The Pharmacological Basis of Therapeutics. 8th edition. 1991.
Gilman, T.W. Rail, A.S. Nies, P. Taylor. McGraw Hill Inc., New York. Appropriate chapters.

Opie, L.H. (2000). Drugs for the Heart. 5th edition. W.B Saunders, Philadelphia.

R.L. Hamlin (Guest Editor) (1991). Efficacy of Cardiac Therapy. *Veterinary Clinics of North America. Small Animal Practice* **21**; Number 5.

Pathology

Jubb, K.V.F., Kennedy, P.C. & Palmer, N. (1985). Pathology of Domestic Animals.
Vol. 3. 3rd edition. Academic Press, London.

Radiology

Suter, P.F. & Lord, P.F. (1984). Thoracic Radiography. A Text Atlas of Thoracic Diseases of the Dog and Cat. Suter, Wettswil.

Electrocardiography

Tilley, L.P. (1992). Essentials of Canine and Feline Electrocardiography. Interpretation and Treatment. 3rd. Edition. Lea & Febiger, Philadelphia.

Vlay, S.C. (1996). A Practical Approach to Cardiac Arrhythmias. 2nd edition. Little, Brown & Co., New York.

Echocardiography / Doppler

Feigenbaum, H. (1994). Echocardiography. 5th edition. Lea & Febiger, Philadelphia.

Weyman, A.E. (1994). Principles and Practice of Echocardiography. Lea & Febiger, Philadelphia.

C. Journal References

As a starting point, Diploma candidates may refer to the limited reading list provided for the RCVS Certificate in Veterinary Cardiology. Diploma candidates are expected to be up to date on all the current veterinary and human cardiology literature and to be able to perform literature searches on specific subjects.

See also: Reading List for the RCVS Certificate in Veterinary Cardiology

Reformatted February 2001/Jan 2002/January 2003

E1(A)

Please ensure that you complete a form E1 and attach it to this form

The Royal College of Veterinary Surgeons

Diploma in Veterinary Cardiology

Details of the veterinary practice in which experience has been or is being gained towards meeting the requirement of at least five calendar years of substantial experience prior to entry for the examination for the Diploma in Veterinary Cardiology:

(If more than one practice please photocopy this form and complete in respect of each such practice)

1. Name of practice and address

2. Date of joining the practice

(and date of leaving if you are no longer employed at this address)

3. Numbers of veterinary surgeons usually working in the practice

4. Approximate percentage time of practice and applicant devoted to:

5. Description of your work insofar as veterinary cardiology is concerned (in relation to the syllabus):

6. Brief description of your other duties:

7. Any special equipment or facilities to which you have access in relation to your work and studies:

Equipment	Manufacturer and model	Additional information
Radiography		
ECG		Single lead or multiple lead capability
Echocardiography		Transducer frequency and type Spectral Doppler Yes <input type="checkbox"/> No <input type="checkbox"/> Colour Doppler Yes <input type="checkbox"/> No <input type="checkbox"/>
Stethoscopes		
Laboratory equipment		

8. Choice of subject for dissertation/published articles

Please give below your choice of subject or references for published articles, including name and date:

If you wish to apply now for formal approval of our choice of subject, please append a brief summary of the aims of the project and the proposed methods to be used to achieve such aims.

9. Have you previously been turned down in any application for recognition as a Specialist?

YES/NO (please delete where applicable)

If yes, please state the reason for rejection and any advice given.

Signature _____

Date _____

Please return original form plus four copies

E2

Diploma in Veterinary Cardiology

Application for FINAL approval of experience and for permission to submit an entry to the next examination

This form must be completed and returned to the RCVS, Belgravia House, 62–64 Horseferry Road, London SW1P 2AF by **1 November** prior to the year in which you wish to enter the examination.

NO LATE APPLICATIONS WILL BE ACCEPTED

1. **Name** in full (block letters)

2. **Degrees/Diplomas/Certificates** _____
(in abbrev. form)

3. **Address** for all correspondence (block letters)

4. **(a) Telephone No(s)** (for contact during day) _____

(b) Email address _____

5. **Date of enrolment** _____ (Month/Year)

If application for enrolment is being submitted concurrently with this application please state 'concurrent'.

Periods of Experience being offered to meet the requirements of the byelaws

A: Approved Centre

Name and address of approved centre	Period of employment (from/to)	Date when approval given (unless this is currently being sought)

B: Approved practice or other branch of the profession (if applicable)

Name and address of practice	Period of employment (from/to)	Date when approval given (unless this is currently being sought)

If there has been any change in the workload of the practice or centre, and/or in your personal work load, since the practice or centre was approved in relation to your enrolment, please give details below and on a separate sheet if necessary.

7. Attendance at relevant courses

Title of course attended: _____

Dates and Venue: _____

8. Other involved in relation to Veterinary Cardiology

List any attendances at relevant congresses, conferences, meetings, symposia, etc., with dates:

9. Publications/Articles/Papers/Lectures

Give details below (including any involvement in the instruction of others):

10. Other Postgraduate studies

During the period of experience being offered, have you been or are you studying for any other postgraduate qualification? **YES / NO**

If yes, give brief details:

11. Submitted work – Choice of subject for dissertation/published articles

Has this subject already been approved by the Board?

YES / NO

If no, then please append a brief summary of the aims of the project(s) and the proposed methods to be used to achieve such aims.

12. **I hereby apply for final approval of experience and for permission to submit an entry to the net Diploma in Veterinary Cardiology examination.**

I certify that the period of experience being offered has not been/is not being offered to meet the requirements of the byelaws for any other RCVS Certificate or Diploma.

13. **Confirmation of intention to sit the examination**

If approval of experience is granted, I do / do not (delete as appropriate) intend to submit an entry to the next examination (closing date for receipt of entries is 1 March).

Signature _____

Date _____

PLEASE RETURN ORIGINAL FORM PLUS FOUR COPIES

The following section should be completed by your adviser:

I confirm that I am acting as this candidate's Adviser.

Name _____
(block capitals)

Signature of Adviser _____

Date _____

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Diploma in Veterinary Cardiology

Candidates should refer to the lists of Specialists and Diploma holders published in Section 3 of the RCVS Register of Members

April 2006

The Royal College of Veterinary Surgeons

Diploma in Veterinary Cardiology

Tuesday 7 July 2009

PAPER I

(3 hours)

Candidates are required to answer **FOUR** out of the following **five** questions on this paper.

Allow 45 minutes per question.

Illegible handwriting or failure to answer the question in the form requested may result in examiners being unable to award marks for information which candidates intended to convey.

1. The endothelium is a key regulator of blood flow to tissues.
 - a. **Give an account** of the factors produced by the vascular endothelium which regulate smooth muscle tone.
 - b. What diseases have dysfunction of the endothelium been well characterized in human medicine and is there any evidence that endothelial cell dysfunction may be important in veterinary species?

2. **Explain the pros and cons** of antagonist drugs which selectively and competitively target membrane receptors in the cardiovascular system.

How might the targeting of second messenger / effector systems (to produce non-competitive and/or physiological antagonism) overcome some of the potential disadvantages? Illustrate your answer **with examples**.

3. How does knowledge of the pathogenesis and epidemiology of atrial fibrillation influence its treatment and management?

4. **Describe** the changes in the foetal heart and circulation that occur on and just after birth.

P.T.O. for Question 5

5.

- a. **Briefly outline** the **FOUR** haemodynamic phases of diastole for the left ventricle.
- b. What factors contribute to the left ventricular passive diastolic properties?
- c. What does it indicate when the left ventricular diastolic pressure-volume relationship is shifted to the right and to the left?
- d. What shifts, if any, to the left ventricular diastolic pressure-volume relationship are seen with the following cardiac disease states?
 - a. Dilated cardiomyopathy.
 - b. Restrictive cardiomyopathy.
 - c. Constrictive pericarditis.
 - d. Isolated chronic mitral regurgitation with LV enlargement.

The Royal College of Veterinary Surgeons

Diploma in Veterinary Cardiology

Tuesday 7 July 2009

PAPER II

(3 hours)

Candidates are required to answer **FOUR** out of the following **five** questions on this paper.

Allow 45 minutes per question.

Illegible handwriting or failure to answer the question in the form requested may result in examiners being unable to award marks for information which candidates intended to convey.

1. A five year-old pregnant, welsh cob mare is presented to you with pyrexia, severe ventral and brisket oedema and engorged jugular veins. The pony was reported to be lame some days earlier, but then became progressively more lethargic. On clinical examination, you detect a grade 5/6 systolic murmur with point of maximal intensity at the cranial left heart base. The murmur is also audible on the right, but at a lesser intensity. The pony has been reliably auscultated in the past and no murmur was noted. Her resting heart rate is 70 beats per minute. Respiratory rate is normal (10 breaths per minute). The mare is six weeks off her expected foaling date.
 - a. What is your most likely diagnosis and why?
 - b. How would you confirm your diagnosis and manage this case?
 - c. What advice would you give to her owners?

2. How can mitral regurgitation be **quantified** using echocardiography?
 - a. **Describe in detail** the available techniques and **discuss** any limitations.
 - b. In your opinion, should quantification of regurgitation be part of a routine echocardiographic examination?

P.T.O. for Questions 3 - 5

3. **Discuss** the electrocardiographic characteristics of supraventricular tachyarrhythmias and their therapies (including both acute and chronic management). Include all proposed SVT mechanisms in your answer, not just those described in dogs.
 4. **Discuss** the various aetiologies and therapy options for canine pulmonary hypertension.
 5. **Explain** the proposed role of the aldosterone antagonist spironolactone in the treatment of congestive heart failure. **Discuss** relevant human and veterinary clinical trial data.
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