Certificate in Veterinary Anaesthesia

Please view the general documents to obtain copies of:

- Timetable
- Guidance Notes B.1 - for candidates on general requirements.
- Role of Advisers to Candidates

The following papers are attached:

**B.2:** Specific Guidance Notes for the Certificate. These notes explain what is required in terms of experience and in terms of the content of the Certificate examinations.

**C:** Syllabus and Commentary for the Certificate.

**D:** Reading list.

**E:** Application Forms E.1A, E.2.

- **E.1A** - for specific details of practice
- **E.2** - for final approval of experience and for permission to submit an entry to the examination

**F:** List of Advisers – also refer to Lists of Certificate holders in Register of Members.

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

April 2010
MEMBERSHIP OF THE ROYAL COLLEGE OF VETERINARY SURGEONS

1. It is a requirement of the Veterinary Anaesthesia Board that ALL Candidates entering for the Certificate are Members of the Royal College of Veterinary Surgeons (MRCVS).

SPECIFIC EXPERIENCE

2. Candidates may gain experience for a Certificate at a) an approved centre for their subject, or b) an approved practice. These are defined in byelaws 5.4 and 5.3 respectively.

3. The majority of candidates will have had experience of anaesthesia either of small or large animals, and the examiners will take this limitation of experience into account when setting the examination. Nevertheless, candidates will be expected to have a theoretical knowledge of anaesthesia in all species, at least to that level expected from a recent graduate. Candidates working in general practices must recognise the necessity of spending a significant part of their time on a continuing basis in work involving anaesthesia.

Approved Centre Route

4. Candidates following the approved centre 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 two years and are required to offer experience in the subject over at least one year full-time or two years’ part-time.

Approved Centres for Veterinary Anaesthesia

5. The following establishments have been granted Approved Centre status.

<table>
<thead>
<tr>
<th>CENTRE</th>
<th>DIPLOMATE/ SPECIALIST</th>
<th>STATUS</th>
<th>APPROVAL YES/NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>The University of Cambridge Department of Veterinary Medicine</td>
<td>Miss R C Bennett MA VetMB CertVA DipACVA MRCVS</td>
<td>Expires 2010</td>
<td>RE-APPROVED Nov. 2005</td>
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<tr>
<td>University College Dublin Veterinary Teaching Hospital</td>
<td>Mrs J M L Hughes MBV DiplECVA DVA MCARCSI MRCVS</td>
<td>Expires November 2012</td>
<td>Approved November 2007</td>
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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 three years and are required to offer experience in the subject over at least two years’ full-time or four years’ part-time.

7. 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.

Final Approval of Experience

8. The form of application for Final Approval of Experience (E2) and for permission to submit an entry to the next examination requires the candidate’s approved experience plus any additional experience to be attested by an adviser.

THE EXAMINATION

9. The examination consists of three Sections:

- 1 case book (comprising case diary + 8 case commentaries)
- TWO x 2 hour written papers, and
- a clinical, oral and practical examination.

SUBMITTED WORK FOR EXAMINATION

Format and Word Count

10. Candidates are required to present a minimum of 200 cases over a period of 8 calendar months. Candidates must also specify the date on which each anaesthetic took place. Eight of these cases should be the subject of a detailed commentary (which should be typed) of not more than 1,000 words per case. The word limit is for the discussion only and does not include appendices, references and tables. There should be no more than 2–3 references per case. Each of these 8 cases must be accompanied by the anaesthetic record. 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 on CD. Please ensure that the disks are easily identifiable by placing them in an envelope with your name, and ‘Electronic version of submitted work for Certificate in Veterinary Anaesthesia’ marked clearly on the front.

11. The purpose of this section of the Certificate examination is to provide the examiners with some idea of the candidate’s range of experience, and to form the basis of discussion where any anaesthetic problems may have arisen.
12. It is not necessary to acknowledge the assistance of veterinary laboratories or veterinary investigation centres etc, where relevant papers are included as part of a case report (names should be deleted if any such papers are included).

13. No more than one of the detailed cases submitted should have received major attention in the form of rewriting by the candidate’s adviser.

14. If the candidate's name should appear on the commentaries or records it should be in a form that has been removed or obliterated, for the purposes of the examination, by the candidate.

15. The case book should list the cases anaesthetized, drugs and apparatus used, and any complications which occur. (An example of a suitable format is attached.)

16. In general practice, the veterinary surgeon will often induce anaesthesia, then operate whilst maintenance is carried out by lay staff. Such cases may be included in the case book but the fact that monitoring was carried out by an assistant should be indicated in some way. Candidates, however, should avail themselves of every opportunity to carry out the total anaesthesia, particularly in major surgery and patients at greater risk.

17. Candidates considering proceeding to the Diploma may wish to keep the more detailed records required for this examination. Part of the requirement for submitted work for the Diploma examination is 300 records of cases of anaesthesia (including techniques of local analgesia but not diagnostic nerve blocks) observed and recorded in detail by them. At least 100 of these case records must relate to cats and dogs, and 100 to large animals which must include a significant number of horses. They should be divided according to species of animal and each section arranged in chronological order.

Grading Scheme:

18. The submitted work will be graded “Good Pass”; “Pass” or “Fail”. Certificate work that achieves a “Good Pass” may be used as an example for prospective candidates.

Candidates are reminded that there are casebooks that have achieved a ‘Good Pass’ available to view in the library as examples. It is also beneficial to candidates to spend as much time with their advisers as possible.

WRITTEN EXAMINATION

Format

19. There will be two written papers covering clinical veterinary anaesthesia in all its aspects, and patient management.

Paper I – 10 compulsory short-answer questions each lasting 12 minutes.
Paper II - 6 essay type questions of which 4 must be answered.

Each question should last 30 minutes. This paper will be divided into sections.

Marks Scheme:

20. 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

Format

21. The clinical and oral examination will be in the order of 1½ hours duration for each candidate.

   (a) In the clinical section of the examination, candidates are given the choice of whether to be examined in "Large" or "Small" animals.

   (b) In the oral examination candidates can expect to be examined on all species of animal with reference to their fitness for anaesthesia and to discuss practical anaesthesia and its relevance to the interpretation of radiographs, ECG’s and biochemical reports. A specific section in the practical examination will be given to the use and understanding of equipment. It should be emphasised that the clinical/oral/practical examination is of equal importance to the other parts of the examination and that candidates must achieve pass marks in this section to avoid failing the examination.

22. Candidates should bring protective clothing and stethoscopes to the clinical/oral/practical examination.

Clinical component (duration approx 20 mins)

23. Candidates are given a clinical case(s) to examine/discuss and will be asked questions relating to the anaesthesia/perioperative management of the case(s).

24. Candidates are permitted to request a small animal or large animal clinical component (note that this is the ONLY portion of the exam where this is permitted - in all other components candidates will be expected to answer questions on both large and small animal anaesthesia).

Steeplechase (duration approx 20 min)
25. This will involve a number of stations with questions based around ECGs, radiographs, blood/blood gas/electrolyte results, and other clinical material. Each station will be of 2 minutes' duration.

**Apparatus/drug practical (duration approx 20 min)**

26. Candidates will be questioned on items of anaesthetic apparatus and various anaesthetic-related drugs.

**Oral (duration approx 20-25 mins)**

27. Candidates may be questioned on all aspects of anaesthesia, including material pertaining to their casebooks and questions related to the content of the written papers.

**Marks Scheme**

28. TOTAL Mark for this Section (c) = 100 marks

**SYLLABUS AND READING LIST**

29. A syllabus, together with a commentary, is provided.

30. A reading/reference list is supplied. However, in view of increased access to the internet, and the ready availability of on-line literature searches, the Board has agreed that the existing reading lists should be frozen in 2002 and that in 2-3 years’ time these lists will be withdrawn altogether. In future, candidates will be expected to do their own research and encouraged to seek advice on suitable reading matter from their advisers and through the RCVS Library and Information Service.

31. Some tapes/slide programmes are available from the Unit for Continuing Education, The Royal Veterinary College, Royal College Street, Camden Town, London NW1 OTU, and from Graves Medical Audiovisual Library, P O Box 99, Chelmsford CM1 5HL. Candidates should consult their adviser as to the suitability of these tapes.

**ATTENDANCE AT SHORT COURSES**

32. The RCVS does not organise courses for the Certificate. Such courses may be organised at a number of centres, but their frequency will depend on demand, and their availability cannot be guaranteed. However, candidates are strongly advised to attend the meetings of the Association of Veterinary Anaesthetists, and the anaesthetic sessions of congresses such as the BVA, BSAVA and BEVA. Courses and meetings in anaesthetic departments of local hospitals may also prove useful.

**ABBREVIATION FOR QUALIFICATION**

33. Successful candidates are permitted to use the appropriate abbreviation after their names in
the RCVS Register of Members, and on practice plates and stationery, etc. The abbreviation for the Certificate in Veterinary Anaesthesia is **CertVA**.

November 1986
### CVA CASE RECORD BOOK: EXAMPLE

<table>
<thead>
<tr>
<th>Date</th>
<th>Case No.</th>
<th>Breed</th>
<th>Age</th>
<th>Sex</th>
<th>Species</th>
<th>Weight</th>
<th>Diagnosis</th>
<th>Procedure</th>
<th>Special considerations</th>
<th>Pre-op treatment</th>
<th>Comments</th>
<th>Premedication</th>
<th>Induction</th>
<th>Maintenance Circuit</th>
<th>Anaesthesia time</th>
<th>Fluid therapy</th>
<th>Notes on procedure Recovery</th>
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<tbody>
<tr>
<td>07/03/95</td>
<td>12547</td>
<td>TBX</td>
<td>16y</td>
<td>M</td>
<td>EQUINE</td>
<td>557KG</td>
<td>Recurrent colic</td>
<td>Exploratory laparotomy</td>
<td>Fit eventer</td>
<td>CVS compromise</td>
<td>minimal</td>
<td>Romifidine 30mg IV</td>
<td>Ketamine 1.1g IV</td>
<td>Hal. in 100% O2</td>
<td>70 mins</td>
<td>Hartmann's 51</td>
<td>NNT O2 for 20mins quality of recovery poor</td>
</tr>
<tr>
<td>07/03/95</td>
<td>12542</td>
<td>TB</td>
<td>16y</td>
<td>G</td>
<td>EQUINE</td>
<td>560kg</td>
<td>Sarcoid-R groin</td>
<td>Remove sarcoid</td>
<td></td>
<td></td>
<td></td>
<td>Romifidine 35mg IV</td>
<td>Ketamine 1.2g IV</td>
<td>Hal. in 100% O2</td>
<td>(N2O/O2 initially)</td>
<td>LA circle</td>
<td>NTT Flunixin 500mg IV pre-op</td>
</tr>
<tr>
<td>08/03/95</td>
<td>12798</td>
<td>Collie</td>
<td>4y</td>
<td>M</td>
<td>CANINE</td>
<td>23.4kg</td>
<td># Humerus</td>
<td>Radiography</td>
<td>Very boisterous</td>
<td></td>
<td></td>
<td>ACP 1mg IM Pethidine</td>
<td>Thiopentone 150mg IV</td>
<td>Hal. in 50% O2, 50% N2O</td>
<td>SA circle 15 mins</td>
<td>Hartmann's 21</td>
<td>Quality of recovery good</td>
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<tr>
<td>09/03/95</td>
<td>12776</td>
<td>GSD</td>
<td>8m</td>
<td>F</td>
<td>CANINE</td>
<td>25.3kg</td>
<td>Forelimb deviation</td>
<td>Radiography Ulnar and radial</td>
<td>Pain</td>
<td></td>
<td></td>
<td>ACP 1mg IM Papaveretum</td>
<td>Thiopentone 200mg IV</td>
<td>Hartmann's 10ml/kg/hr</td>
<td></td>
<td></td>
<td>Carprofen 100mg SC post-op</td>
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<tr>
<td>09/03/95</td>
<td>12946</td>
<td>Dob.</td>
<td>3y</td>
<td>F</td>
<td>CANINE</td>
<td>37.6kg</td>
<td>Lameness</td>
<td>Radiography EMG</td>
<td></td>
<td></td>
<td></td>
<td>ACP 2mg IM Pethidine</td>
<td>Thiopentone 300mg IV</td>
<td>Hal. in 50% O2, 50% N2O</td>
<td>SA circle 55 mins</td>
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*This is an example of the requested format and the type of information required. It is not necessarily a recommendation for the techniques described.*

*A key for any abbreviations used should be included in the case record book.*

*December 1996*
<table>
<thead>
<tr>
<th>Date</th>
<th>Case No.</th>
<th>Species</th>
<th>Breed</th>
<th>Age</th>
<th>Sex</th>
<th>Weight</th>
<th>Diagnosis</th>
<th>Procedure</th>
<th>Special considerations Pre-op treatment</th>
<th>Comments</th>
<th>Premedication</th>
<th>Induction</th>
<th>Maintenance Circuit Anaesthesia time Fluid therapy</th>
<th>Notes on procedure Recovery</th>
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<tbody>
<tr>
<td>19/04/95</td>
<td>12225</td>
<td>CANINE</td>
<td>Yorks. terrier</td>
<td>4</td>
<td>M</td>
<td>6.05kg</td>
<td>Urinary problem</td>
<td>Radiography</td>
<td>Pain</td>
<td>ACP 0.2mg IM</td>
<td>Morphine 1.2mg</td>
<td>Thiopentone 50mg</td>
<td>Hal. in 50% O2 50% N2O Ayre’s T – piece 25 mins</td>
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<tr>
<td>20/04/95</td>
<td>12743</td>
<td>EQUINE</td>
<td>ArabX</td>
<td>15</td>
<td>M</td>
<td>360kg</td>
<td>Sagittal # P3 LH</td>
<td>Repair # with lag screw</td>
<td>Excitable Horse Need smooth recovery after # repair Pain</td>
<td>ACP 10mg IM Butorphanol 20 mg IM to sedate for jugular catheter placement.</td>
<td>Thiopentone 2g IV</td>
<td>GGE 20g IV</td>
<td>Hal. in 100% O2 N2O/O2 initially LA circle 100 mins Hartmann’s 61</td>
<td>Dobutamine infusion required to maintain mean arterial blood pressure above 60mmHg Post-op LH plantar digital nerve block (bupivicaine) Flunixin 350mg IV post-op NTT</td>
</tr>
<tr>
<td>20/04/95</td>
<td>12743</td>
<td>BOVINE</td>
<td>Friesian</td>
<td>2.5</td>
<td>F</td>
<td>80kg</td>
<td>Umbilical hernia</td>
<td>Umbilical hernia repair</td>
<td>Small-hypothemia Pain</td>
<td>Xylazine 10mg IV Butorphanol 10mg IV</td>
<td>Hal. In 100% O2</td>
<td>Hal. In 100% O2 SA circle 140 mins Hartmann’s 2.5l</td>
<td>Pethidine 200mg IM pos-op</td>
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<tr>
<td>Date</td>
<td>Patient</td>
<td>Breed</td>
<td>Age</td>
<td>Gender</td>
<td>Weight</td>
<td>Condition</td>
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<td>Monitoring</td>
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<tr>
<td>22/04/95</td>
<td>TB</td>
<td>17y F</td>
<td>500kg</td>
<td>Colic post foaling</td>
<td>Exploratory laparotomy</td>
<td>Pulse quality very poor, mucous membranes pale grey</td>
<td>Xylazine 300mg IV</td>
<td>Ketamine 1.1g IV, Diazepam 30mg IV</td>
<td>Hal. In 100% O2 LA circle 90 mins 7% NaCl 1.75l Hartmann’s 17.5l</td>
<td>360degree large colon torsion corrected Phenylephrine used to improve pulse quality as dobutamine ineffective Mixed metabolic and respiratory acidosis throughout procedure but improving</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>22/04/95</td>
<td>ArabX</td>
<td>14y G</td>
<td>280kg</td>
<td>RF heel wound</td>
<td>Cast RF</td>
<td>Need smooth recovery to maintain cast</td>
<td>Romifidine 22mg IV</td>
<td>Ketamine 0.55g IV, Diazepam 10mg IV</td>
<td>Hal. In 100% O2 (N2O/O2 initially) LA circle 70 mins</td>
<td>Xylazine 75mg IV post-op Recovery very rapid</td>
<td></td>
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</table>

This is an example of the requested format and the type of information required. It is not necessarily a recommendation for the techniques described.

A key for any abbreviations used should be included in the case record book.  

(Dec 1996)
THE ROYAL COLLEGE OF VETERINARY SURGEONS
CERTIFICATE IN VETERINARY ANAESTHESIA

Commentary on the Syllabus

Candidates will have to be competent clinicians with a sound working knowledge of anaesthesia together with an awareness of its legal requirements. They should be able to assess the individual case, select a suitable anaesthetic and administer it accordingly. A general understanding of anaesthesia in all animals will be required but a particular involvement in one species or group of species (e.g. small animals, horses, farm animals, laboratory animals) will be acceptable.

A. CLINICAL ANAESTHESIA

1. Pre-operative clinical assessment - clinical examination, interpretation of radiographs, and ultrasonography, EGG’s, haematological and biochemical reports, effects of existing pathology and current medication and the preparation of the animal for anaesthesia.

2. Analgesia - Signs of pain, the physiological and pharmacological principles of pain control, application of analgesic techniques before, during and after surgery, the pharmacology of commonly used analgesic drugs.

3. Sedation - the clinical pharmacology of drugs used as sedatives and tranquillisers in veterinary practice, the application of neuroleptanalgesia.

4. Premedication - aims of premedication and the basic pharmacology of the drugs commonly used for this purpose and knowledge of their influence on the course of anaesthesia.

5. General anaesthesia - the principles of anaesthetic technique:

   a. the effect of anaesthesia on:

      i. the central, peripheral and autonomic nervous systems,

      ii. respiration, including a knowledge of the physiology of its control; of pulmonary/alveolar gas exchange and transport of oxygen and carbon dioxide,

      iii. cardiovascular system, including a knowledge of the clinical physiology of the heart and circulation

      iv. body temperature, including maintenance and the effects of change from normal,

      v. renal and hepatic function, including a knowledge of the clinical physiology and the effects of drugs.
b. Care of the unconscious animal - maintenance of an airway, the functional anatomy of the larynx and pharynx, the use of endotracheal tubes, tracheostomy and support of pulmonary ventilation, monitoring, assessment of the level of consciousness and the condition of the animal during and after surgery. Elementary knowledge of simple monitoring devices used in veterinary practice will be required (not detailed knowledge of electrical circuits etc.)

c. Apparatus - practical knowledge of the use and maintenance of inhalational anaesthetic apparatus, selection of suitable systems (circuits), the importance of airway resistance and apparatus, dead space and flow of gases through the system, the design, function and limitation of commonly used vaporizers, the use and storage of gases, the risks of fires and explosions, the use of pollution control devices and the practical details of at least one ventilator familiar to the candidate.

d. Intravenous anaesthesia - the pharmacology and clinical application of drugs used for induction and maintenance of anaesthesia, including methods of administration, duration of activity and elimination, interaction with other drugs and hazards of administration.

e. Inhalation anaesthesia - the pharmacology and clinical application of commonly used agents, including the physical properties, vaporisation, uptake and elimination, diffusion of gases across membranes.

f. Muscle relaxation - the clinical physiology of the neuromuscular junction and the pharmacology of drugs used in anaesthetic practice which relax skeletal muscle, indications for the use of neuromuscular blocking drugs and methods of reversing their action.

g. Intermittent positive pressure ventilation - its applications for thoracotomy, and the paralysed animal and for resuscitation.


7. Local and Regional Analgesia - anatomy of the spinal cord, epidural space and peripheral nerves commonly blocked in veterinary local analgesic techniques, the pharmacology of local analgesic drugs and their application topically, by local infiltration, regional, epidural and spinal techniques in veterinary practice.
B. PATIENT MANAGEMENT

The principles of intensive care for animals suffering from severe trauma and advanced disease as well as their care before, during and after surgery must be understood. Candidates should understand the applied physiology of the body fluids, the general nature of colloids and crystalloids, the activity of electrolytes, hydrogen ions, bases and buffers.

Ability to make a broad clinical assessment of fluid, electrolyte and acid base disturbances, the techniques of administration of fluids and the selection of the appropriate treatment for the conditions occurring commonly in veterinary practice will be required, also the indications for and management of, blood transfusion in animals and the use of blood products. Candidates will be expected to prescribe supportive measures, including nutrition, during the post-operative period which will reduce the effects of surgery and speed recovery and include maintenance of circulatory perfusion, adequate pulmonary ventilation, the provision of heat and maintenance of renal output.

March 1982
Amended November 1982
Reviewed December 1994/Feb95/jan96
THE ROYAL COLLEGE OF VETERINARY SURGEONS CERTIFICATE IN VETERINARY ANAESTHESIA

Syllabus


B. Patient Management - the care of animals before, during and after surgery, including special care for those that are diseased or severely traumatised. Assessment and treatment of fluid, electrolyte and acid-base disturbances. Blood transfusion.

   Maintenance of circulatory, pulmonary, hepatic and renal homeostasis in surgical cases.

C. General Medicine and Surgery - the principles and practice of medicine and surgery with emphasis on the diagnosis and management of clinical conditions where anaesthesia with or without surgical intervention is likely to be used.

March 1982
Amended November 1982
Reviewed December 1994
READING LIST FOR VETERINARY ANAESTHESIA CERTIFICATE AND DIPLOMA CANDIDATES

Candidates should note that the reading list for Veterinary Anaesthesia 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.

This list is not intended to be exhaustive and candidates are not expected to consult or read all of these books. Publications in black/italic type are suggested for certificate candidates. Physiology & pharmacology contained within anaesthetic texts is of sufficient detail for the certificate. A list of useful websites and e-mail addresses is also included.

BOOKS AND JOURNALS

VETERINARY ANAESTHESIA

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<thead>
<tr>
<th>Author</th>
<th>Title</th>
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<tr>
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<td>1996</td>
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<td><em>Hall, Clarke, Trim</em></td>
<td><em>Veterinary Anaesthesia 10th Edn</em></td>
<td>2000</td>
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<td>Short (ed)</td>
<td>Principles and Practice of Veterinary Anaesthesia</td>
<td>1987</td>
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<td><em>Seymour (ed)</em></td>
<td><em>BSAVA Manual of Small Animal Anaesthesia and Analgesia 3rd Edn</em></td>
<td>1999</td>
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<tr>
<td><em>Hall and Taylor</em></td>
<td><em>Anaesthesia of the Cat</em></td>
<td>1994</td>
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<tr>
<td><em>Flecknell</em></td>
<td><em>Laboratory Animal Anaesthesia</em></td>
<td>1996</td>
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<tr>
<td><em>Muir, Hubbell and Skarda</em></td>
<td><em>Handbook of Veterinary Anaesthesia</em></td>
<td>1989</td>
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<td><em>Muir and Hubbell</em></td>
<td><em>Equine Anesthesia, Veterinary Clinics of North America: Various</em></td>
<td>1990</td>
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<td><em>Haskins, Klide</em></td>
<td><em>VCNA small animal practice: opinions in small animal anaesthesia</em></td>
<td>1992</td>
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<td></td>
<td><em>VCNA small animal practice: clinical anaesthesia</em></td>
<td>1999</td>
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### FUNDAMENTALS OF ANAESTHESIA

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<th>Title</th>
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<tr>
<td>Hemmings and Hopkins</td>
<td>Foundations of Anaesthesia. Basic and Clinical Sciences</td>
<td>1999</td>
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<tr>
<td>Miller</td>
<td>Anesthesia (5th edition)</td>
<td>2000</td>
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<tr>
<td>Starr</td>
<td>Anesthesiology Boards</td>
<td>2000</td>
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<tr>
<td>DiBartola</td>
<td>Fluid Therapy in Small Animal Practice 2nd Edn</td>
<td>2001</td>
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### EQUIPMENT

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<tr>
<td>Al. Shaikh and Stacey</td>
<td>Essentials of anaesthetic equipment</td>
<td>1995</td>
</tr>
<tr>
<td>Moyle (Contributor)</td>
<td>Ward’s Anaesthetic Equipment</td>
<td>1992</td>
</tr>
<tr>
<td>Dorsch &amp; Dorsch</td>
<td>Understanding Anaesthetic Equipment 4th ed.</td>
<td>2001</td>
</tr>
</tbody>
</table>

### PHYSIOLOGY

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>Respiratory Physiology: The essentials</td>
<td>1990</td>
</tr>
<tr>
<td>Ganong</td>
<td>Review of Medical Physiology</td>
<td>1995</td>
</tr>
<tr>
<td>Stoelting</td>
<td>Handbook of Pharmacology and Physiology in Anesthetic Practice</td>
<td>1995</td>
</tr>
<tr>
<td>Author</td>
<td>Title</td>
<td>published</td>
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<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Iman GR</td>
<td>Applied Cardiovascular Physiology. 2nd Ed. London, Butterworths</td>
<td></td>
</tr>
<tr>
<td>Cunningham</td>
<td>Textbook of Veterinary Physiology</td>
<td>2000</td>
</tr>
<tr>
<td>Power I, Kam P</td>
<td>Principles of Physiology for the Anaesthesist</td>
<td>2001</td>
</tr>
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</table>

**STATISTICS-EXPERIMENTAL DESIGN**

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rowntree</td>
<td>Statistics without Tears</td>
<td>1981</td>
</tr>
<tr>
<td>Zbinden, Thomson</td>
<td>Conducting Research in Anaesthesia and Intensive Care Medicine (Butterworth)</td>
<td>2001</td>
</tr>
<tr>
<td>Altman DG</td>
<td>Practical Statistics for Medical Research (Chapman and Hall)</td>
<td>1996</td>
</tr>
<tr>
<td>Petrie, Watson</td>
<td>Statistics for Veterinary and Animal Science</td>
<td>1999</td>
</tr>
</tbody>
</table>
### INTENSIVE CARE

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
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<tbody>
<tr>
<td>Wingfield</td>
<td>Veterinary Emergency Medicine Secrets</td>
<td>2001</td>
</tr>
<tr>
<td>Wingfield</td>
<td>The Veterinary ICU Book</td>
<td>2002</td>
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### PHARMACOLOGY

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
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<tbody>
<tr>
<td>Rang Dale &amp; Ritter</td>
<td>Pharmacology</td>
<td>2000</td>
</tr>
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</table>

### PHYSICS - MEASUREMENT

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh, Mushin, Epstein</td>
<td>Physics for the Anaesthetist, Blackwell Scientific Publications</td>
<td>1991</td>
</tr>
<tr>
<td>Davis, Parbrook, Kenny</td>
<td>Basic Physics and measurement in anaesthesia</td>
<td>1990</td>
</tr>
</tbody>
</table>
PAIN IN ANIMALS

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short, Poznak</td>
<td>Animal Pain</td>
<td>1992</td>
</tr>
<tr>
<td>Flecknell, Waterman-Pearson</td>
<td>Pain Management in Animals</td>
<td>2000</td>
</tr>
<tr>
<td>Hellebrekers</td>
<td>Animal Pain</td>
<td>2000</td>
</tr>
<tr>
<td>Tranquilli, Grimm, Lamont</td>
<td>Pain Management for the small animal practitioner</td>
<td>2000</td>
</tr>
</tbody>
</table>

PAIN GENERAL

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>published</th>
</tr>
</thead>
</table>

JOURNALS

**Anaesthesia Journals**

**Veterinary Anaesthesia and Analgesia**
- Anaesthesia
- Anesthesia and Analgesia
- Anesthesiology
- British Journal of Anaesthesia

**Emergency medicine**

- Journal of Veterinary Emergency and Critical Care
- Critical Care Medicine
Veterinary Medicine

*Veterinary Record*
American Journal of Veterinary Research
Research in Veterinary Science
Journal of the Veterinary Medical Association
Veterinary Surgery
Journal of the American Animal Hospital Association (JAAHA)

Small Animals

*Journal of Small Animal Practice*

Horses

*Equine Veterinary Education*
*Equine Veterinary Journal*

Laboratory Animals / Exotic Animals
Laboratory Animal
Laboratory Animal Science

The following list is not comprehensive, but may be useful as an introduction to Internet resources for veterinary anaesthetists.

**EMAIL DISCUSSION LISTS**

ACVA-L
Veterinary anesthesia and analgesia
Send subscription request to Dr John Ludders JWL1@cornell.edu or Dr Pauline Wong PLWONG@ucdavis.edu.

VECCS-L
Veterinary emergency and critical care medicine
Send subscription request to Dr Bernie Hansen bernie_hansen@ncsu.edu.
GASNet Anesthesiology Discussion Group
Human anesthesia – moderate mail volume, moderate noise level.
Archived messages accessible without subscription:
http://www.gasnet.org/anesthesiology/index.php
Send subscription request to Dr Keith Ruskin ruskin@harpo.med.yale.edu

Pediatric Anaesthesia Conference
Human pediatric anesthesia – low volume, low noise
Archived messages accessible without subscription:
http://www.gasnet.org/pac/index.php
Send subscription request to listmaster@anaes.sickkids.on.ca

Pediatric Pain
Human pediatric pain – low volume, variable noise
Send subscription request to Dr G Allen Finley allen.finley@dal.ca

CCM-L
Human critical care medicine – high volume, moderate noise
Send subscription request to Dr David Crippen crippen+@pitt.edu

WEB SITES

COMPUTERIZED LITERATURE SEARCH

US National Library of Medicine Databases & Electronic Information Sources
Medline

PubMed (free Web access to Medline)
OldMedline (Citations for biomedical journal articles published 1958-1965 can be searched via the NLM Gateway)
http://gateway.nlm.nih.gov/gw/Cmd

National Agricultural Library’s (NAL) AGRICultural OnLine Access (AGRICOLA)
http://www.nal.usda.gov/ag98/ag98.html

VETERINARY ANESTHESIA & CRITICAL CARE

American College of Veterinary Anesthesiologists
http://www.acva.org/

Association of Veterinary Anaesthetists
http://www.aveta.org.uk

European College of Veterinary Anaesthesia
http://www.ecva.org.uk/

Veterinary anaesthesia chapter of the Virtual Anaesthesia Textbook

Veterinary Emergency and Critical Care Society
http://veccs.org/

Future European Veterinary Emergency and Critical Care Society
http://www.eveccs.org/

MEDICAL ANESTHESIA & CRITICAL CARE

GASNet
http://www.gasnet.org
Virtual Anaesthesia Textbook (VAT)
http://www.virtual-anaesthesia-textbook.com/

Wright’s Anesthesia and Critical Care Resources on the Internet (ACCRI)
http://www.eur.nl/fgg/anest/wright/index.html

Hardin Meta Directory - Anesthesiology
http://www.lib.uiowa.edu/hardin/md/anesth.html

Martindale’s Anesthesiology Center
http://www-sci.lib.uci.edu/~martindale/MedicalSurgery.html#AA

Pediatric, critical care and medical Internet resources
http://pedsccm.wustl.edu/Internet.html

Pediatric Pain
http://is.dal.ca/~pedpain/

IntensiveCare.com
http://www.intensivecare.com/

New York Online Access to Health (NOAH)

VETERINARY ANESTHESIA JOURNALS ONLINE

Veterinary Anaesthesia and Analgesia

Journal of Veterinary Pharmacology and Therapeutics
Veterinary Surgery (issues of Veterinary Anesthesia published in this journal prior to 2001)

**MEDICAL ANESTHESIA AND PAIN ORGANIZATIONS and JOURNALS**

http://members.tripod.com/navarian5/journals.html

American Society of Anesthesiologists
http://www.asahq.org

International Association for Anesthesia Research
http://iars.org

International Association for the Study of Pain
http://www.iasp-pain.org/

Acta Anaesthesiologica Scandinavica
<http://journals.munksgaard.dk/tidsskrifter.nsf/a3b40ef0ca9b8d86c1256a160050049I/f30a37adce76589ec1256a110036150c?OpenDocument>

Anaesthesia

Anesthesia & Analgesia
http://www.anesthesia-analgesia.org/

Anesthesiology
http://www.anesthesiology.org

British Journal of Anaesthesia
http://bja.oupjournals.org/
Canadian Journal of Anesthesia
http://www.cas.ca/public/journal/

Internet Journal of Anesthesiology

**VETERINARY**

NetVet
http://netvet.wustl.edu/vet.htm

American Veterinary Medical Association’s Network of Animal Health (NOAH)
http://www.avma.org/network.html

International Veterinary Information Service (IVIS)
http://www.ivis.org/

Veterinary Information Network (VIN)
Http://www.vin.com/

Martindale’s Health Science Guide 2000: The “Virtual ~ Veterinary Center
http://www-sci.lib.uci.edu/HSG/Vet.html

National Animal Poison Control Center
http://www.napcc.aspca.org/
http://www.aspca.org/site/PageServer?pagename=apcc

US Food and Drug Administration Center for Veterinary Medicine
Adverse Drug Experience Reports
http://www.fda.gov/cvm/index/ade/adetoc.htm
US Pharmacopeia
Drug product reporting

Veterinary Medical Schools, Veterinary Technology Schools
http://netvet.wustl.edu/vschool.htm

E-Vet
http://www.e-vet.com/

Products, supplies, services, listings
http://www.vetscape.net/supplies.htm

November 2002
PLEASE ENSURE THAT YOU COMPLETE A FORM E1 (TO BE FOUND IN THE COMMON DOCUMENTS) AND ATTACH IT TO THIS FORM.

THE ROYAL COLLEGE OF VETERINARY SURGEONS

Specialisation and Further Education

CERTIFICATE IN VETERINARY ANAESTHESIA

Details of the veterinary practice/establishment in which experience is being gained over at least two calendar years to meet the requirements of the byelaws for the Certificate in Veterinary Anaesthesia:

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

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. Approx. case load per month:

<table>
<thead>
<tr>
<th>dog and cat</th>
<th>horses</th>
</tr>
</thead>
<tbody>
<tr>
<td>farm animals</td>
<td>other species</td>
</tr>
</tbody>
</table>

5. Equipment/facilities available

This check list is intended to be a guide to the requirements for an approved practice. It is not intended that these facilities should be regarded as mandatory, but is provided merely for guidance.
Please indicate which of the following facilities you have in your practice.

a. Apparatus for the administration of controlled inhalational anaesthesia. YES / NO
   if yes, please specify:

b. Facilities for weighing animals YES / NO
   if yes, please specify:

c. Facilities for hospitalisation of small animals YES / NO
   Facilities for hospitalisation of large animals YES / NO

d. Radiographic equipment YES / NO
   If yes, please specify

e. Basic laboratory facilities YES / NO
   If yes please specify
f. Equipment for the administration of fluid therapy  YES / NO

g. Suction equipment  YES / NO

h. Surgical equipment for major surgery including thoracotomy  YES / NO

i. Please state how many lay assistants are employed in your practice?

How many are Veterinary Nurses?

6. Approximate throughout of cases of anaesthesia:

<table>
<thead>
<tr>
<th></th>
<th>No. per month</th>
<th>Dog and cat</th>
<th>Horses</th>
<th>Farm animals</th>
<th>Other species</th>
</tr>
</thead>
<tbody>
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</table>

7. Proportion of cases specified in question 6 above, which you personally undertake:

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<tr>
<th></th>
<th>%</th>
<th>Dog and cat</th>
<th>Horses</th>
<th>Farm animals</th>
<th>Other species</th>
</tr>
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<tbody>
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<td></td>
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</tbody>
</table>
8. Do you have access to:

   a) library facilities, (if so please specify)

   b) training centre

Signature ____________________________________________

Date ________________________________________________

PLEASE RETURN ORIGINAL PLUS FOUR COPIES

THE FOLLOWING SECTION SHOULD BE COMPLETED BY YOUR ADVISER

I have agreed that this candidate will be advised by me and note that it is the candidate’s responsibility to approach me as necessary.

Name ________________________________________________
(block capitals)

Signature ___________________________ Date _____________
CERTIFICATE IN VETERINARY ANAESTHESIA

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. TITLE

2. NAME in full (block letters)

3. DEGREES/DIPLOMAS/CERTIFICATES (in abbrev.form)

4. ADDRESS for all correspondence (block letters)

5. (a) TELEPHONE No(s) (for contact during day)

   (b) FAX No. (for contact during day)

   (c) EMAIL

6. DATE OF ENROLMENT (MONTH/YEAR)
7. **PERIODS OF EXPERIENCE BEING OFFERED** to meet the requirements of the byelaws

<table>
<thead>
<tr>
<th>Veterinary Practice or Centre (name and address)</th>
<th>Period of employment (from/to)</th>
<th>Certified by Practice Principal</th>
</tr>
</thead>
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</tbody>
</table>

If there has been any change in the work-load of the practice/centre or in your personal work-load, since you applied for enrolment, please give details below:


8. **ATTENDANCE AT RELEVANT SHORT COURSES**
Candidates are asked to fill in the **CPD Record Card** for each year for which they are applying for final approval of experience. Details of all relevant short conferences and meetings attended should be shown. Candidates must comply with the annual recommended minimum hours of CPD otherwise final approval of experience and permission to sit the next examination will not be granted.

9. **OTHER INVOLVEMENT IN RELATION TO VETERINARY ANAESTHESIA**
List any attendances at relevant congresses, conferences, meetings, symposia, etc., with dates:
10. **PUBLICATIONS/ARTICLES/PAPERS/LECTURES**
    Give details below (including any involvement in the instruction of others):

11. **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, please give brief details:

12. **I HEREBY APPLY FOR FINAL APPROVAL OF EXPERIENCE AND FOR PERMISSION TO SUBMIT AN ENTRY TO THE NEXT CERTIFICATE EXAMINATION IN VETERINARY ANAESTHESIA.**
    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.

    Signature: ___________________________  Date: ___________________________
13. **CONFIRMATION OF INTENT 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 = 1 March).

Signature  ________________________________________________________________

Date  ________________________________________________________________

**PLEASE RETURN ORIGINAL 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  ________________________________________________________________

Please return **four** copies of this form to the RCVS

Please note: The Royal College is occasionally asked, by Course organisers and other such people, for address lists of candidates enrolled for this subject. If you would prefer your name and address NOT to be sent out in response to such requests, please tick this box

[ ]
CERTIFICATE IN VETERINARY ANAESTHESIA ADVISER LIST

Candidates should consult the RCVS Register of Members for a suitably willing and qualified individual (someone holding a Certificate or Diploma or equivalent) who is familiar with the RCVS Certificate or Diploma examination system and clinically active.
THE ROYAL COLLEGE OF VETERINARY SURGEONS

CERTIFICATE IN VETERINARY ANAESTHESIA

TUESDAY 21 JULY 2009

PAPER 1
(2 hours)

Candidates are required to answer **ALL TEN** questions.

Allow 12 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. Write **short notes** on the physiological effects of pregnancy that impact on anaesthesia.

2. **List** the potential problems associated with anaesthesia in birds.

3. **Compare and contrast** alpha-2 adrenoreceptor agonists and acepromazine in veterinary anaesthesia.

4. **Outline** your approach to managing the analgesic requirements of a cat undergoing an exploratory laparotomy.

5. Write **short notes** explaining the following terms:
   
   a. Affinity.
   b. Potency.
   c. Efficacy.

6. **Briefly describe** the anaesthetic considerations and your approach to anaesthetise a pet Vietnamese pot-bellied pig presented for routine castration.

7. What are the limitations of pulse oximetry?

8. **Describe** your approach to a 12 year-old Warmblood gelding for **standing** oral extraction of the left third maxillary cheek tooth. The clinician estimates the extraction may take 3 hours.

P.T.O. for Questions 9 and 10
9. Write **short notes** on how you can determine when a carbon dioxide absorbent (e.g. soda lime) is no longer absorbing enough carbon dioxide to prevent re-breathing. **List** the advantages **and** disadvantages to each approach.

10. What is meant by the term ‘Base Excess’? How might you utilise the information it imparts during the peri-anaesthetic period?
Candidates are required to answer **FOUR** of the following **SIX** questions.

Allow 30 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. “Nitrous oxide is an outdated drug and has no place in modern veterinary practice.”

   **Discuss** this statement in relation to veterinary anaesthesia.

2. **Discuss** the use of pain assessment, with application to different veterinary species.

3. **Compare and contrast** ‘in-circuit’ and ‘out-of-circuit’ vaporisers.

4. **Discuss** the use of neuromuscular blocking agents in horses.

5. **Write an essay** on the management of hyperkalaemia in the peri-anaesthetic period.

6. **Describe in detail** the anaesthetic considerations for a dog presenting with an oesophageal foreign body.