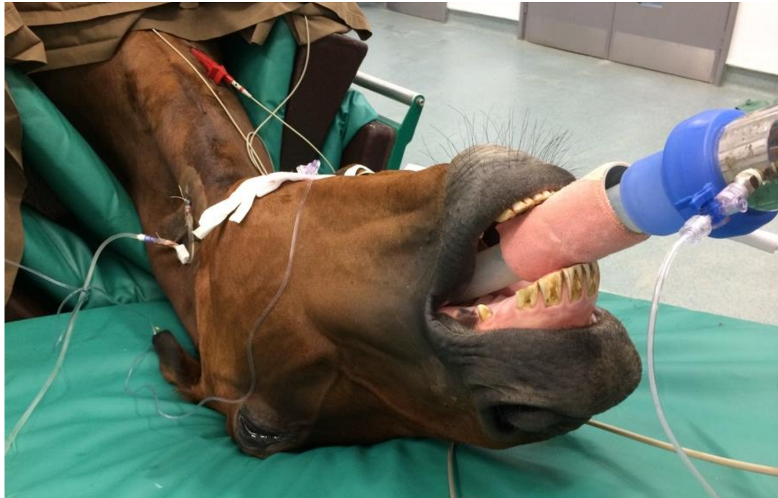
Royal Veterinary College
University of London

Certificate in Advanced Veterinary Practice

C-VA.2 Equine Anaesthesia and Analgesia

Module Outline



Module Leaders:

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European and RCVS Specialist in Anaesthesia and Analgesia

Enrolment guidance

The aim of the module is to enable you to extend and consolidate clinical knowledge and skills gained at undergraduate level, and to develop an in-depth understanding of the application of that knowledge in a practice environment in relation to equine anaesthesia.

You should fulfil the following criteria:

a) You should have completed module B-EP.3.
b) If you are only enrolling for the C-VA modules, it is **highly recommended** that you submit an equine anaesthesia essay for review, written at B module standard and following the guidelines required for the B-SAP.1 anaesthesia essay. The subject of the essay should be on preparing for an equine anaesthetic. This essay will be reviewed by the assessors prior to assessment of any C Module work. This is to ensure you are aware of the standard required for C module work.
c) It is your responsibility to ensure that you have access to sufficient cases to produce adequate material for the module.

Coverage of this module may be integrated with others, particularly other B and C modules. All candidates will normally have completed A-FAVP.1 Foundations of Advanced Veterinary Practice module, and at least one of the practice B modules, before undertaking a C module, although you can choose to work through modules in a different order if you wish. In whichever order modules are tackled, compliance with best practice for all the topics covered by module A-FAVP.1 will be expected whenever these are appropriate in C modules. For example, awareness of, and compliance with, all relevant legislation, welfare and ethical principles will be required throughout.

Before embarking on any module, you are advised to plan a structured programme of continuing professional development to help them achieve their objectives. Involvement in ‘learning sets’ and networks of other candidates working towards the same or similar modules is encouraged; this could be initiated by the candidates themselves via RVC Learn. The RCVS considers that candidates will need advisers/mentors to support them through the programme; you are free to choose their own advisers/mentors.

For a designated Certificate in Advanced Veterinary Practice (Veterinary Anaesthesia) you must complete this module, one further C-VA/C-LAS.1 module, two ‘free choice’ 10 credit modules and an RCVS synoptic assessment.

Learning outcomes

At the end of the module, you should be able to:

- Examine a horse and appreciate the relevance of clinical, haematological, biochemical and other specific diagnostic findings on the conduct of anaesthesia and management of the perioperative period
- Appreciate the impact of pre-existing disease on the conduct of anaesthesia and management of the perioperative period
- Understand the pharmacology and clinical use of drugs used for premedication, sedation, analgesia and standing surgical anaesthesia
- Understand the pharmacology and clinical use of intravenous anaesthetic drugs and their use in total and partial intravenous techniques
- Understand the pharmacology of the inhalant anaesthetic agents and their use in anaesthesia
- Understand the functional characteristics of the anaesthetic breathing systems and anaesthetic machine
- Appreciate the advantages and disadvantages of intermittent positive pressure ventilation and how this may be delivered
- Understand in general terms how the electronic monitoring systems used during anaesthesia function, and be able to interpret the information they provide
- Understand the anatomy of the spinal cord, epidural space and peripheral nerves commonly blocked by local anaesthetic techniques. Understand the pharmacology of local anaesthetic drugs, their application (topical, local infiltration, regional and epidural techniques) and appreciate the procedures suited to local anaesthetic / analgesic techniques
- Understand the effects of anaesthesia on cardiovascular function, appreciate how these effects can be minimised and understand the pharmacology and clinical effects of drugs commonly used to support cardiovascular function

- Plan and deliver appropriate fluid therapy (including an awareness of the principles of blood transfusion)
- Understand the effects of anaesthesia on oxygenation and ventilation. Appreciate how these are maintained and monitored during anaesthesia
- Understand the specific problems associated with anaesthesia in foals including differences in physiology and pharmacology, the effects of pre-existing disease, hypothermia and management of the mare
- Recognise and deal with common anaesthetic emergencies and complications that develop in the peri- and postoperative periods, which result in mortality or morbidity. Understand the pathophysiology of these conditions and methods to minimise their development
- Review and constructively criticise current literature on the speciality, to determine its relevance to their current practice
- Utilise their understanding of evidence based medicine and decision analysis to develop practical anaesthetic techniques for their patients
- Review the outcomes of at least part of their clinical work, using the process of clinical audit to improve performance
- Recognise when a case is beyond their personal or practice capabilities, and provide an effective channel of referral

Learning topics

Aspects of physiology related to anaesthesia, including current knowledge of the function of peripheral and autonomic nervous system, cardiovascular and respiratory systems and the transport of gases, the control of water, electrolytes, hydrogen ions and buffers in biological systems, hepatic and renal physiology and endocrinology.

Pharmacology, a knowledge of the actions of all drugs used in anaesthesia and supportive care including an understanding of pharmacokinetics and metabolism, the effects of change in composition of body fluids and transport across cell membranes.

Biophysics relevant to anaesthesia, techniques of biological measurement used in clinical and experimental animals and interpretation of results including statistics.

Equine specific anatomy: CNS, spinal cord and the main nerve trunks blocked in regional analgesic techniques and a knowledge of the anatomy of the thorax, abdomen, head and neck as they relate to anaesthesia.

Equine anaesthesia (including techniques and drugs) pre-operative clinical assessment, sedation, analgesia, premedication, intravenous anaesthesia, inhalational anaesthesia, induction and maintenance of general anaesthesia, monitoring during anaesthesia. Use of neuromuscular blocking agents. IPPV. Local and regional analgesic techniques.

Relevant anaesthetic apparatus: basic understanding of anaesthetic machines, breathing circuits, vaporizers, monitoring equipment etc.

Knowledge of the pathophysiology of common equine diseases and disorders as they affect anaesthesia, as well as the way anaesthesia may affect pathological processes, particularly those diseases which affect cardiovascular, respiratory and renal function and those which produce metabolic disturbances.

Assessment

- One case report can be submitted for review prior to being marked. This is only permitted once per candidate per discipline.

- A case diary that documents a broad range of cases requiring anaesthesia and documents your experiences over a minimum of 90 days and no fewer than 50 general anaesthetics. All cases should be those that have been directly managed by you. If you have chosen to spend time seeing practice with a diploma anaesthetist, those cases you observe being managed can be included in the case diary and may be mentioned in the synoptic essay but should be in addition to the minimum case requirements for this module.

- At the end of the case diary you should include a 500-1,000 word synopsis of what you have learned from the module. This might include what has changed in your approach to a case, any new procedures or investigations that are now considered, any additional reading which was helpful, and/or any unexpected features of a case which will influence decision making in the future.

- Ten cases from the diary should include brief (< 350 words per case) critical commentaries describing some of the learning resources used, and documenting how the learning process was applied to the case. **These should be principally reflective in nature; commentaries that are merely a literature review of aspects relevant to the case will not achieve a passing grade.**

- Four case reports, with a combined total word count of 6,000 words and each individual case book being a minimum of 1,000 words. In combination, these cases should be selected to demonstrate that you have developed proficiency in the skills and understanding of the learning objectives outlined in the module content. The cases used should be different from the ones used in the critical commentaries.

It is important that there is evidence from the case diary, critical commentaries and synoptic essay that you are familiar with and has reviewed all of the specified learning topics for the module.

Assessment weighting

- Case diary with synopsis 20%
- Critical commentary 30%
- Case reports 50%

Annual assessment timetable

1st November	Please inform the CertAVP office if you are intending on submitting work
12th November	You are given the opportunity to have one case report per discipline reviewed prior to marking (therefore only one for all C-VA modules). Please submit your report by this date if you haven't already had a review.
12th December	Case report feedback returned to you
31st January	All work to be submitted
31st March	You will be notified of your results

Learning support activities

Learning support is provided to aid self-directed learning and to provide easy access to published articles. You will be given a username and password which will allow you to log on to 4 different systems:

1. RVC Learn (http://learn.rvc.ac.uk/)

- Tips for module preparation with the case diary template
- Mixed anaesthesia and analgesia questions
- Articles on anaesthesia equipment, pharmacology and topics relevant to human and veterinary anaesthesia
- Access to discussion forums that are used by all CertAVP candidates as well as RVC tutors.
- Access to the RVC online library. This is invaluable when researching literature for writing up case reports. This means that (with rare exception) all journal articles that you want to view can be downloaded to your PC with a few mouse clicks. This includes original research articles as well as review articles and case reports. IT and Library support is available for this facility (email library@rvc.ac.uk or helpdesk@rvc.ac.uk).
- There are also several CPD courses run each year at the RVC that support some of the learning outcomes for C-VA modules. CertAVP candidates receive a 20% discount on RVC CPD courses – please contact the CertAVP office for further details.

2. RVC Intranet (https://intranet.rvc.ac.uk)

Access to all information available to all RVC students and employees, for example, news, events, policies, committees, services, Library, IT helpdesk, etc.

3. Athens (http://www.openathens.net/)

A huge amount of any library's information is now available online, e.g. electronic journals, e-books and databases. 'Athens' is a system used by UK universities for controlling access to these type of online services and with your username and password, you can access many of a library's online databases, electronic journals and e-books seamlessly.

4. Email (http://mail.rvc.ac.uk)

You are given an RVC email address, which is **compulsory** to use for CertAVP communication and submission of work.

Case diary guidelines

- Cases collected from up to 12 months prior to the date of enrolment on the CertAVP programme can be submitted for assessment.

- A suggested template is provided on Learn. Please note that this is not intended as a required format, and not all the information shown in the example need necessarily be included in case diary submissions. This should be taken as a guideline and adapted for the suitability of your caseload and practice. Similarly, the case examples that are included should not be taken as 'ideal' or recommended methods of case management, they are provided only as indicators of the type of information the examiners are looking for in the diary, and it is likely that you may find you wish to include additional information. Doses in mg/kg (or mcg/kg as appropriate) should be provided for all drugs administered. It should be easy to identify from the case diary which cases are the subject of a critical commentary or a case report.

- Up to 20% of cases submitted can be standing surgical procedures, however sedations for non-invasive procedures, such as radiography, and diagnostic nerve blocks should not be included. It is expected that for most of these standing sedation cases local or regional analgesic techniques will be utilised and the case diary should include details of this, as well as that of any other analgesia administered.

- Whilst it is appreciated that many cases anaesthetised in general practice may be for routine procedures (eg. castration), a case diary consisting entirely of routine castrations would be unlikely to achieve a pass grade. You should make every effort to anaesthetise a wider range of cases to enhance the learning process during the module and achieve coverage of the learning topics specified for the module.

Reflective synopsis guidelines

Guidelines for suitable material for the reflective synopsis are provided in the module description documents available on Learn. These tend to vary widely, and there is no set information that the examiners are looking for. Examples may include aspects of anaesthetic management that have been evaluated during the C module period, information you have

learned or become particularly interested in during the process, or any changes that have been made as a result of undertaking the C module.

Critical commentaries guidelines

Each commentary should be <350 words in length and should be primarily reflective in nature. These are intended to demonstrate skills associated with applying various learning resources to case management. They are not intended to be literature reviews of how to anaesthetise particular patients, or complete case reports. Instead, it is expected that some case aspects will be discussed in the context of how your learning resources (e.g. journal articles, online searches, book chapters, CPD events or advice/ discussion with colleagues) were useful in supporting or directing case management. This is an opportunity to discuss any cases where things went wrong, or where you feel improvements can be made. Commentaries may also include unusual cases, for which the discussion would not be of sufficient length or detail to meet the requirements for a case report, but where you used learning resources to change your case management or learn new techniques. An example critical commentary is provided at the end of this module outline.

Case reports guidelines

Case reports should demonstrate your ability to use the competencies that have been acquired to cope with a challenging situation, emphasising critical thinking, problem solving, patient assessment and application of knowledge. They should not be “textbook cases” describing how to manage particular conditions, nor do they need to represent perfect management (although it would be expected that discussion of possible improvements would form part of the report). The case reports may include comparative aspects of other cases and knowledge gained from other species as evidence of learning. To avoid repetition, it is permissible to cross-reference between the components of the module work, for example where the same principles have been applied to different cases. **It is imperative that you don't tell us only what you are doing but why you are doing it and furthermore that you understand the why. Justification / explanation of case management that is based solely on non critical extracts from the literature is generally too descriptive and not indicative of understanding of case management, and therefore will usually not reach the standard required at this level.**

The following frame work should be used as a guide to the structure of the case report:

- Identification of patient
- History
- Clinical signs
- Problem list as this relates to anaesthetic management
- Pre-anaesthetic investigations
- Anaesthetic management
- Discussion
- References

You should be reminded that these are intended to be written at Master's degree level. Previous submissions have occasionally failed because of failure to demonstrate the desired level of knowledge and understanding of the learning objectives. Although diploma-level detail is not expected, it is anticipated that to reach C module passing status, you will have needed to attend some advanced level anaesthesia CPD, spent some time with a diplomate anaesthetist, or spent the suggested learning hours reading relevant textbooks and scientific literature at an advanced level.

It is challenging to include the level of detail required to reach this level within the word limit provided, however concise scientific writing is one of the skills necessary to work to this level. A few tips:

- Avoid repeating information, since however relevant it is, marks can only be awarded for a particular piece of information once. Common examples have been discussing pharmacology of the same anaesthetic agents, or reasons for anaesthetic circuit selection, in all case reports. Information such as this, that is relevant to many cases, can instead be included in the case diary critical commentaries where appropriate. Alternatively, details such as these could be included in one case report, but then not repeated in the remaining reports. Cross-referencing between different components of the module package is acceptable.

- Avoid including large chunks of information which are not relevant to clinical case management. The reports are intended to demonstrate how you have applied information you have learnt to improve or support clinical case management. The most common example of this is anaesthetic pharmacology – however tempting, it is not necessary to include large paragraphs on anaesthetic pharmacology that are

irrelevant to case management or agent selection, and marks will not be awarded for this. Instead, focus on aspects of pharmacology that help you decide which agents to use, or may present a problem. Agent selection for complicated cases is rarely ideal, and knowledge of pharmacology is used to explain how anticipated drug side effects are managed. Another example is the inclusion of large amounts of information on how anaesthetic monitors work – again, this information is important to learn during module preparation, but should be described in the context of how the information provided by monitors is useful. Additionally, lots of detail on the surgical procedures and techniques is not required for an anaesthetic case report. It is important to appreciate when a surgical technique may impact on patient physiology and anaesthetic management, and details of this may be included, but specific surgical approaches and suture patterns are not required!

- Avoid the temptation to select cases that are too complicated to adequately discuss in 1,000-1,500 words. Instead, choose cases where an underlying disease state, use of a particular technique (e.g. multimodal analgesia, total intravenous anaesthesia) or management of an anaesthetic complication contributed to the case being interesting and challenging, and where this can be discussed in detail. A 2 day old septic foal with a congenital heart defect having colic surgery may provide a fascinating case example, but cannot possibly be discussed to the required level within the word limit! In these situations, it would be highly likely that you would be penalised for failing to discuss important case information in sufficient detail.

Note that cases selected do not need to represent ideal or perfect management, and frequently well-written reports highlight where things went wrong or how they could have been done differently. You are in no way disadvantaged because of lack of availability of equipment or individual drugs. Discussion of how management could be improved if alternative equipment etc was available or if costs allowed often provides a valuable component of the case report. This should be explained in the context of how it would be helpful, rather than listing all the additional equipment/ drugs etc that would be used in a different setting.

Case reports should be written in the third person in a style suitable for publication in a Journal (for example Equine Veterinary Education or Veterinary Anaesthesia & Analgesia). You are expected to demonstrate a high standard of literacy and please ensure that any spelling and grammatical errors have been corrected.

References:

- These should be properly cited in the text, in accordance with the style in Veterinary Anaesthesia & Analgesia. Do not list references that were not cited in the text or vice versa.
- We recommend using Harvard referencing.
- You will find it very helpful to use a program such as Endnote® or Reference manager® to organise your references.

Appendices:

- You may include appendices but please note that the examiners are not obliged to read them (so please don't include essential case information).
- Images may be included here or in the main body of text. Include any images that you think are relevant as these generally enhance your report and enable examiners to assess your interpretation.
- Laboratory reports may be included here but all abnormalities need to be written in the text and reference ranges must be included. It is acceptable to scan printed reports rather than re-type them if you prefer, but any case details or details of your name or practice must be blanked out.

The word limit is 6,000 words for all four case reports. Tables, figure legends, appendices and reference list are NOT included in the word count. The report title and titles within the report ARE included. You should not put important information, such as the physical examination, into a table to avoid the word count; only numerical data should appear within a table (such as laboratory results). In the interests of fairness to all candidates the word count is adhered to strictly and reports that exceed it will be returned unmarked.

All written work submitted to the Royal Veterinary College is passed through plagiarism detection software. Work submitted for this module should not have been submitted for any other courses at RVC or other institutions.

Instructions for submitting work

Each piece of work you submit must be anonymous and please ensure that your work includes this table on the front page:

Student number:	
Module:	C-VA.2
Piece of work:	*case diary synopsis, case report 1, case report 2 etc*
Word count:	

Contact the CertAVP office if you need a reminder of your student number (found on your Rover email when you first enrolled). All work is submitted online via Learn; you will be given further instructions when you enrol.

The case diary should be written in Excel and organised in such a way that it can be easily viewed on one page/screen in landscape view. Other work should be in Word.

The content of case reports must also be anonymous, e.g., removing practice details from discharge notes or laboratory reports.

Sample critical commentaries (<350 words – cited references excluded)

Critical Commentary 1: Alternative induction agents

Case diary reference 17: a 14 year old Arabian cross gelding presented for tenoscopy.

The present owner reported that upon purchasing the horse 5 years ago, the previous owner had said the horse was "allergic to ketamine" but no further details of the problem were known. Ketamine is my routine induction agent but I thought it wise to avoid this, in case the horse had a further adverse reaction. Other possible induction agents investigated included propofol, alfaxalone or thiopental. I discounted the possibility of using an inhalational induction as the horse was too big and excitable and the risk of injury to itself or personnel was unacceptably high. Induction quality after propofol in horses varies, with some authors reporting poor (Mama et al. 1996) and others reporting excellent inductions (Brosnan et al. 2011), depending on the choice of sedative, muscle relaxant and propofol dose. The risk of a poor quality induction or failing to induce adequate depth of anaesthesia ruled out propofol. Alfaxalone produced acceptable quality inductions and recoveries compared to ketamine (Kloppel & Leece 2011; Keates et al. 2012). However, for this size of horse, alfaxalone was prohibitively expensive.

Thiopental was used in horses for many years although it is no longer licensed. Taylor & Clarke (2007) recommend use of 5-6 mg/kg thiopental after premedication with ACP and detomidine, as is my usual practice. I spoke to one of the senior partners in my practice who had used thiopental and he advised that the speed of induction would be more rapid than I was used to and the horse might paddle its legs on initial recumbency. He also advised that, although intubation would be possible, the horse would not be adequately anaesthetised to lift on the hoist straight away.

I decided to use thiopental. I ensured deep sedation from detomidine before induction. Induction was rapid (within 30-45 seconds) but very smooth with no paddling. After intubation, I brought the anaesthetic machine to the recovery box and administered isoflurane for around 3 minutes before hoisting the horse. No reaction was seen to hoisting and anaesthetic maintenance was unremarkable.

Word count: 348

References:

- Brosnan RJ, Steffey EP, Escobar A et al. (2011) Anesthetic induction with guaifenesin and propofol in adult horses. Am J Vet Res 72, 1569-75.
- Keates HL, van Eps AW & Pearson MR (2012) Alfaxalone compared with ketamine for induction of anaesthesia in horses following xylazine and guaifenesin. Vet Anaesth Analg doi: 10.1111/j.1467-2995.2012.00756.x.
- Kloppel H & Leece EA (2011) Comparison of ketamine and alfaxalone for induction and maintenance of anaesthesia in ponies undergoing castration. Vet Anaesth Analg 38, 37-43.
- Mama KR, Steffey EP & Pascoe PJ (1996) Evaluation of propofol for general anesthesia in premedicated horses. Am J Vet Res 57, 512-6.
- Taylor PM & Clarke KW (2007) Handbook of Equine Anaesthesia, 2nd Edition, Saunders.

Critical Commentary 2: Anaesthetic machine fault

Case diary reference 24: a 4 year old TB gelding presented for fetlock arthroscopy.

After routine anaesthetic induction, the horse was connected to the anaesthetic machine and circle breathing system and standard monitoring was applied, including capnography. IPPV was instituted due to hypoventilation (RR<4 bpm). After 40 minutes, I noticed a sudden change in the capnography trace. Inspired and expired CO_2 increased rapidly from 0 to 8 mm Hg and 52 to 60 mm Hg respectively. Initially I checked the soda lime for exhaustion, but less than 25% had changed colour and the soda lime was fresh at the start of the anaesthetic. As changes in inspired CO_2 usually indicate an equipment problem (Dugdale 2010), I systematically checked the breathing system. During the course of the anaesthetic a lot of water vapour had accumulated and condensed in the expiratory parts of the circle tubing and around the Perspex housing of the one-way valves. On closer inspection, I realised that the expiratory valve was stuck open, causing CO_2 rebreathing (Dugdale 2010). I tapped on the Perspex housing and the valve fell back into place. Immediately, the inspired CO_2 returned to zero. Expired CO_2 decreased more slowly over the next 10 minutes. I discovered that expiratory valve faults have been previously reported as a cause of CO_2 rebreathing in dogs and cats (Cantwell & Modell 2001).

I did not open the valve housing during the anaesthetic as the escape of isoflurane would pollute the environment. Room air would dilute the inspired gases, possibly resulting in the horse inhaling insufficient isoflurane. However, after the anaesthetic, I carefully examined

the expiratory valve and valve housing. One of the metal bars which holds the valve in place was slightly bent inwards, which may have happened when the valve was removed for drying after a previous anaesthetic. I suspect that as water vapour accumulated, the valve became stuck on this bent metal rod due to surface tension. I bent the metal rod slightly back outwards to reduce the risk of this sticking again and have warned all staff involved in anaesthesia about this complication.

Word count: 348

References:

- Cantwell SL & Modell JH (2001) Inadvertent severe hypercarbia associated with anesthesia machine malfunction in one cat and two dogs. J Am Vet Med Assoc 219, 1573-6
- Dugdale A (2010) Veterinary Anaesthesia Principles to Practice, 1st Edition, Wiley-Blackwell.

Mentors

Candidates who study for the CertAVP medicine C modules with the Royal Veterinary College (RVC) are advised to find a mentor who can guide them. Finding a mentor, and maintaining appropriate and regular contact, are the responsibility of the candidate and mentors operate on a goodwill basis only. Suitable mentors may include holders of the RCVS CertVA or RCVS CertAVP qualifications or holders of American, European or RCVS Diploma qualifications. Individuals who are examiners for the CertAVP C modules (the module leaders) are not able to act as mentors.

What does the role of mentor involve?

The CertAVP is quite different from the previous RCVS certificate qualifications (see later), and therefore we encourage mentors to familiarise themselves with the guidance notes, learning objectives, assessment criteria and case guidelines for the C-VA modules. In addition, we consider that the role of mentor may include:

- Encouraging candidates to undertake continuing professional development and to 'see practice' at relevant centres appropriate to your strengths and weaknesses.
- Guide candidates on the level and amount of reading that they should be doing during your period of study. Most RVC CertAVP candidates choose to have access to the RVC library and have an Athens password for online journal access. For C module work we encourage use of primary research papers in addition to review articles and textbooks; one of the objectives includes the ability to critically review the literature and to attempt to have a balanced view of the literature where differing opinions exist.
- Encourage candidates to get support from other CertAVP candidates either through the RVC learning support discussion forums or by other means.

What is the mentor's role regarding submitted work?

We consider that a mentor can give general advice on preparation of a case log and selection of cases for writing up into full-length reports. We do not recommend that mentors give detailed written advice on case reports. However, one read through of one case report and some general feedback (ideally verbally) is acceptable. Candidates will be asked to confirm which report has been read at the time of submission. Candidates are given guidance notes on preparation and layout of case reports and these can be found in the relevant module outline documents.

Suggested reading

The following list is given as a guide as to where to start and for this reason cannot be considered ‘complete’. We also don’t expect you to read texts from cover to cover or to use all of the texts listed, however we do recommend you make use of the most recent edition of textbooks where available. We apologise if you feel a particular favourite is missing - feel free to use the Learn discussion board to pass on additional suggestions to other candidates.

Textbooks

- Manual of Equine Anaesthesia, Doherty and Valverde
- Equine Anaesthesia: Monitoring and Emergency Therapy, Muir and Hubbell
- Lumb and Jones’ Veterinary Anaesthesia and Analgesia 5th edition (2015) Tranquilli, Thurmon and Grimm
- Equine Emrgency: Treatment ad Procedures Orsini Divers (2014)

Journals:

- Veterinary Anaesthesia and Analgesia
- Journal of Veterinary Emergency and Critical Care
- Journal of the American Veterinary Medical Association
- Equine Veterinary Journal
- Equine Veterinary Education