Certificate in Advanced Veterinary Practice

C-ECC.1 Critical Care

Module Outline

Module Leader:

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RCVS Recognised Specialist in Emergency and Critical Care
Associate Professor in Transfusion Medicine and Emergency and Critical Care

Enrolment guidance

Before embarking on this module, you should fulfil the following criteria:

a) You should ideally have completed a B Practice module.

b) If you have completed a B Practice module at another institution, you may submit one report for feedback by RVC assessors. If you are only enrolling for the ECC C modules it is highly recommended that you write one report from your relevant B Practice module and this will be reviewed by the assessors prior to assessment of any C module work.

c) It is your responsibility to ensure that you have access to sufficient critical care cases to both produce adequate material for the case reports and also to allow sufficient experience to develop in this area as this will greatly enhance your ability to pass the written examination.

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 candidates can choose to work through modules in a different order if they 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.

You are advised to plan a structured programme of continuing professional development to help you achieve your 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 certificate.

For a designated Certificate in Advanced Veterinary Practice (Emergency and Critical Care) you must complete this module with a combination of C-ECC.2, C-ECC.3, C-VA.3 or a fourth 10 credit module and an RCVS synoptic assessment.

Standards

The aim of this module is to enable the candidate to extend and consolidate clinical knowledge and skills gained at undergraduate level, so that they can apply this knowledge to patients who have simultaneous problems in multiple body systems over multiple days. Through review and adaptation of existing knowledge, the candidate will develop an understanding of what is and is not being assessed in a patient within their own practice. The candidate will be able to evaluate their own standards of critical care and to develop strategies for continuous improvement in the future.

Areas covered

The module is one of three C- level modules in Emergency and Critical Care. This module is focused upon the physiology, pharmacology and management of the critically ill patient with multisystem disease.

The module is aimed at veterinary surgeons in general small animal practice or at an emergency service who are seeing and managing critically ill small animal patients. The module is written from a small animal perspective. The majority of the material will apply to the dog or cat, with a minority of the material addressing common conditions of rabbits and other species.

Learning outcomes

This module will enable you to:

- Gain a sound understanding of the interplay between the cardiovascular, respiratory, renal and endocrine systems that controls cardiopulmonary homeostasis in the critically ill patient.

- Develop a variety of skills that can be used in treating and monitoring critically ill patients.

- Thoughtfully appraise your current working practices with regard to monitoring, treatment and communication issues surrounding the critically ill patient.

Learning topics

1. Physiology, Pharmacology and Assessment of the Critically Ill Patient

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

- Document an understanding of the cardiac cycle, principles of oxygen delivery and oxygen consumption, homeostatic and compensatory control of blood pressure.

- Describe methods of assessing cardiovascular status such central venous pressure, pulmonary capillary wedge pressure, ECG, echocardiography and arterial blood gases

- Discuss common cardiovascular drugs, including anti-arrhythmics, vasopressors, inotropes and anti-hypertensives drugs.

- Document an understanding of the factors controlling respiratory function and how to assess ventilation-perfusion mismatches

- Describe methods of delivering oxygen and assisted ventilation over hours or days, and using blood gas analysis to monitor a patient

- Document an understanding of the principles and methods of enteral and parenteral nutritional support

- Document an understanding of the pathophysiology of vomiting, diarrhoea and ileus, and the mechanisms by which commonly-used pharmacotherapeutics act to control these derangements

- Document an understanding of renal physiology, including factors that control sodium, potassium, chloride and bicarbonate excretion, and the mechanisms by which commonly-used pharmacotherapeutics act to influence these factors

- Document a thorough understanding of fluid therapy, including crystalloid, colloid and blood products, linear and non-linear methods of calculating fluid requirements, calculation of electrolyte replacement requirements, fluid compartments in the body, factors controlling fluid shifts within the body, calculating fluid balance, calculating

constant rate infusion dosages and volumes, using fluid pumps and syringe pumps, and treating common acid-base disturbances

- Show a practical understanding of clinical pathology as it applies to the assessment of critically ill patients, including microscopic evaluation of blood smears, methods of assessing coagulation status, evaluation of body fluids and basic cytology.

- Discuss the indications, contra-indications, routes of delivery and adverse effects of anaesthetics and analgesics available for use in the critically ill patient, such as alfaxalone, propofol, benzodiazepines, ketamine, lidocaine, bupivacaine, morphine, methadone, fentanyl, butorphanol, acepromazine, buprenorphine, dexmedetomidine, medetomidine, non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol.

- Document an understanding of the basic physiology of pain transmission pathways within the body and how different classes of analgesics block those pathways.

- Discuss the risk factors, pathophysiology, clinical signs and treatment options for systemic inflammatory response syndrome, sepsis, septic shock and refractory septic shock.

2.   Communication Strategies

On completion of the module, you must be able to discuss and present information that reflects a thorough understanding of patient, client, referral and team communication issues. You should be able to:

- Review and assess issues and solutions regarding patient information management, such as records management, tracking therapies, ways of documenting findings, and clinical audit methods

- Develop skills that address client communication issues, such as the process and sequence of grief, bereavement behaviours, managing client anger, communicating financial information, communicating patient progress, and ways of documenting client consent and deferment

- Develop skills that facilitate excellent referral and colleague communication, such as writing clear, concise patient summaries, communicating suggestions for ongoing therapy, and strategies for avoiding misunderstandings.

- Demonstrate an understanding of team management issues, such as understanding both hidden and obvious stressors, managing stress, interpersonal communication strategies, communicating expectations, and preparation for emergencies

Assessment

- 3 written case reports of 1,750 words each.

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

- A 1,000 word essay on a current area of human critical care with reflection on the application of this to veterinary critical care. The essay subject should be agreed with the CertAVP team beforehand.

- 2 hour examination (unseen clinical cases) to assess the breadth and depth of your knowledge base and problem solving ability.

Guidance is given below for preparation of case reports and please do listen to the C-ECC webinar on Learn for further assessment guidance. Examples of successful work are available on Learn. Please use the forum to ask any questions you have about these submissions.

Annual assessment timetable

1st February	If you are submitting work for assessment on the following dates, please inform the CertAVP office and notify us of your essay subject.
16th February	You are given the opportunity to have one case report per discipline reviewed prior to marking (therefore only one for all ECC modules). Please submit your report by this date if you haven't already had a review.
16th March	Case report feedback returned to you
30th April	Case reports and essay to be submitted
30th June	You will be notified of your results
July	2 hour examination (date to be confirmed)
Late August	You will be notified of your exam result and module pass

Assessment weighting

- Case reports   33%

- Essay   33%

- Exam   34%

February 2021

Learning support

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/)

- Sample essay, case diary and synopsis, case report and exam questions
- Guidance for mentors
- Interesting articles to read
- Access to discussion forums that are used by all CertAVP candidates as well as RVC tutors. The forums can be used to discuss any topic relevant to the CertAVP ECC modules or simply to find out who else is out there!
- Study buddy list
- A webinar which contains guidance on preparing written work for the ECC modules
- Access to presentations from the CertAVP Induction Day
- 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.
- There are also several CPD courses run each year at the RVC that support some of the learning outcomes for ECC 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.

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 report guidelines

The cases should be selected to exhibit your ability to use your acquired competencies to manage a patient that has multiple systemic problems requiring treatment or monitoring over at least 24 hours. Cases should be chosen to demonstrate critical care which is defined as the care of patients whose conditions are life threatening and require constant care and organ support from medications. Examples of this could include post-operative management of the acute abdomen, septic patients, acute hepatic failure, acute kidney injury and hypoxaemia or respiratory failure. The discussion in the report should also include comparative aspects relevant literature on the condition including in other species (often humans) as evidence of learning.

Cases seen up to 12 months prior to the date of enrolment on the CertAVP programme will be accepted, and you should have had primary control of an extended period of the critical care phase.

The case report should be written in the third person in a style suitable for publication in a journal (for example Journal of Small Animal Practice). You are expected to demonstrate a high standard of literacy; please check carefully for any spelling and grammatical errors. You may use well-known abbreviations as long as these are explained in an appendix.

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 and differential diagnoses
- Investigation
- Diagnosis
- Treatment
- Outcome
- Discussion
- References

Images

Images may be used where they provide valuable information for the case. For radiographs lateral views of any part should be orientated with the cranial or rostral part to the viewers left. Ventrodorsal and dorsoventral images should be viewed with the left side on the

viewers right. Lateral and medial should be consistent throughout the report. For ultrasound images cranial should be to the left with ventral surface at the top of the image.

Essay guidelines

Please listen to the C-ECC webinar on Learn for assessment guidance on the writing of the essay. Examples of successful work are available on Learn.

Instructions for submitting work

Each piece of work you submit must be anonymous. Please name your files to include the following: module code, your student number, and the type of work you are submitting, and email them to certavp@rvc.ac.uk:

CECC1 Student Number – Case report - REVIEW

CECC1 Student Number – Case report 1

CECC1 Student Number – Case report 2

CECC1 Student Number – Case report 3

CECC1 Student Number – Essay

If a piece of work is a re-submission, please name your file like this:

CECC1 Student Number – Case report 3 RE-SUB

Please ensure that the beginning of your work include:

- Module name
- Your student number
- Case report title
- Word count (excluding the above, tables, photo titles and references)

References

- These should be properly cited in the text. Do not list references that were not cited in the text or vice versa.
- We recommend using Harvard referencing as described by the Anglia-Ruskin University (http://libweb.anglia.ac.uk/referencing/harvard.htm).
- You may find it 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. Normal ultrasound images need not be included unless you would like to do so but clearly abnormal images should be included if

possible.

- 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.

Any work that that exceeds the permitted word count will be returned to you for re-submission within the word limit. This is in the interest of fairness as it is difficult to compare work exceeding the word limit with one which has been kept to the required limits. Additionally, the ability to keep a discussion tightly focused, with every word counting, is an important skill to have developed at this level. You should not put important information, such as the physical examination, in to a table to avoid the word count; only numerical data should appear within a table (such as laboratory results). Figure legends, appendices and a reference list are NOT included in the word count. The report title and titles within the report ARE included.

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.

Suggested reading list

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.

ECC Textbooks

- BSAVA manual of Emergency and Critical Care - Boag & King
- Small Animal Critical Care Medicine – Silverstein & Hopper
- Fluid Therapy in Small Animal Practice, DiBartola
- Handbook of Veterinary Procedures and Emergency Treatment - Ford & Mazzaferro
- Veterinary Emergency & Critical Care Procedures, Hackett & Mazzaferro
- Emergency and Critical Care Manual – K Mathews
- Small Animal Emergency & Critical Care Medicine – Macintire, Drobatz et al
- Veterinary Emergency Medicine Secrets - Wingfield
- Textbook of Small Animal Surgery - Fossum

Journals

- You are encouraged to review recent issues of the Journal of Veterinary Emergency and Critical Care.

Online Resources
www.medscape.com
www.webmd.com
www.pubmed.gov