C-VA.2 Equine Anaesthesia and Analgesia

Credits: 10 (100 hours)

Provider: Veterinary Postgraduate Unit – School of Veterinary Science

RCVS Content Covered

The following outlines the modular content as set out by the RCVS.

At the end of the module, candidates 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 peri-operative period
- Appreciate the impact of pre-existing disease on the conduct of anaesthesia and management of the peri-operative period
- Understand the pharmacology and clinical use of drugs used for premedication, sedation and standing surgical anaesthesia
- Understand the pharmacology and clinical use of intravenous anaesthetic drugs and their use in total intravenous techniques
- Understand the pharmacology of the inhalant anaesthetic agents and their use in anaesthesia
- Understand the functional characteristics of the anaesthetic breathing systems
- Appreciate the advantages and disadvantages of intermittent positive pressure ventilation and how this may be delivered
- Understand 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 analgesic drugs, their application (topical, local infiltration, regional and epidural techniques) and appreciate the procedures suited to local analgesic techniques
- Understand the effects of anaesthesia on cardiovascular function, appreciate how these effects can be minimised and the pharmacology of drugs commonly used to support cardiovascular function
- Understand the effects of anaesthesia on oxygenation and ventilation and appreciate how these are maintained and monitored during anaesthesia
- Understand the specific problems associated with anaesthesia in foals including 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 postoperative period, 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

Syllabus

Aspects of physiology related to anaesthesia, including current knowledge of the function of the peripheral and autonomic nervous systems, 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; 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 and IPPV. Local and regional analgesic techniques.

Relevant anaesthetic apparatus; basic understanding of anaesthetic machines, breathing circuits, vaporizers and monitoring equipment.

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.

Aim of the Module

The aim of this module is 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.

Learning Outcomes

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

1. demonstrate a critical awareness of the relevance of clinical, haematological, biochemical and other specific diagnostic findings on the conduct of anaesthesia and management of the peri-operative period and develop the ability to recognise the impact of pre-existing disease on the conduct of anaesthesia and management of the peri-operative period;

2. demonstrate the ability to understand the anatomy and physiology of the neurological, cardiovascular and pulmonary systems, the effects of anaesthesia on these body systems and how deleterious effects can be minimised with appropriate selection of drugs;
3. evaluate critically the pharmacology of the commonly used drugs and their application in sedation, premedication, standing surgery, induction and recovery in equine anaesthesia;
4. demonstrate the ability to recognise and deal with common anaesthetic emergencies and complications that develop in the postoperative period, which result in mortality or morbidity;
5. understand the pathophysiology of these conditions and methods to minimise their development;
6. appraise critically the literature relevant to clinical cases in the topics covered and discuss how the literature can be used to inform practice while demonstrating the ability for critical reflection on their clinical work, including identifying potential clinical audit points translating to new protocols or measureable outcomes.

Module Structure

The module will be divided into 5 study units:

Study Unit 1 Anatomy and Physiology: This unit will cover the anatomy and applied physiology of the cardiovascular and respiratory systems with specific emphasis on their role in oxygenation and ventilation. It also includes a review of the anatomy of the neurological system and its relevance to equine anaesthesia.

Study Unit 2 Pharmacology: This unit will cover the pharmacology of the drugs commonly used in equine anaesthesia, including injectable and inhalational agents, and their role in sedation and anaesthesia of the equid. A focus is placed on the potential side effects of these drugs, and strategies to pre-empt and manage side effects.

Study Unit 3 Equipment and Monitoring: This unit will cover the equipment used in equine anaesthesia and its application. The advantages and disadvantages of intermittent positive pressure ventilation and the importance of appropriate monitoring are emphasised.

Study Unit 4 Anaesthesia of the Foal: This unit will focus on the specific considerations in anaesthesia of the foal including the importance of recognition of pre-existing disease and hypothermia.

Study Unit 5 Emergency Anaesthesia: This unit will cover common equine emergencies including wounds, fractures and colic and the special anaesthetic considerations given to each disease state. Emphasis is placed on an understanding of the underlying disease conditions and how these affect anaesthesia planning.

Assessment Strategy

Portfolio of cases (20 case log book), 3 x detailed case reports (1500 words), 1 x short answer question and/or MCQ test at the end of the module and 1 x journal critique/journal club presentation (pass/fail)