

## C-VC.1 Cardiovascular Anatomy, Physiology and Pathology

**Credits:** 10 (100 hours)

**Provider:** Veterinary Postgraduate Unit – Institute of Veterinary Science

### RCVS Content Covered

On successfully completing this module, candidates would be expected to have knowledge of, and understand the clinical relevance of:

#### Anatomy:

- The gross anatomy of the mammalian heart, pericardium, and great vessels
- The microscopic anatomy of the myocardium and the myocyte
- The cardiac pacemaker, conduction system and autonomic nerves supplying the heart.
- The gross anatomy of the upper and lower respiratory tract including the nasal chambers, nasopharynx, larynx, trachea, bronchi, alveoli, thoracic cavity, pulmonary parenchyma and pulmonary vessels.
- The organisation of the circulation *in utero*, before birth, and the changes that occur after birth.
- Characteristic congenital abnormalities of the heart and circulation such as patent ductus arteriosus, pulmonic stenosis, ventricular septal defect, aortic stenosis, vascular ‘ring’ abnormalities and Tetralogy of Fallot.
- Familiarity with congenital abnormalities which are common in certain species and certain breeds.
- Comparative anatomy covering species of major veterinary interest.

#### Physiology:

- The cardiac cycle.
- Myocardial function
- Impulse conduction
- Vascular microanatomy and physiology
- Central/neural control of the heart and circulation
- Blood pressure control
- Cardiovascular response to exercise
- Cardiovascular effects of trauma
- The physiology of the pericardium
- Anaesthesia and the cardiovascular system
- Fluid balance
- Pregnancy
- Age and the cardiovascular system

- The physiology of the airways
- Gas exchange in the lungs
- Blood gases and acid-base balance
- Electrolyte physiology and the circulation
- Integrative physiology: CNS, CVS, respiratory and renal function

### **Pathology:**

- Shock and circulatory failure
- Blood clotting and clotting defects
- Hypertension and hypotension
- Heart failure
- Arteriosclerosis and atherosclerosis
- Tachycardia and bradycardia
- Pre-load and afterload
- Valvular incompetence
- Dilated cardiomyopathy
- Hypertrophic cardiomyopathy
- Neoplasia and the heart
- Pericardial disease
- Comparative aspects of cardiovascular disease
- Rhinitis, nasal and nasopharyngeal disease
- Laryngeal, tracheal and bronchial diseases
- Asthma, COPD and small airway diseases
- Pulmonary parasitology
- Pneumonia
- Respiratory failure
- Disorders of the pleural space / thorax
- Systemic disease and the CVS / respiratory system
- Comparative pathology of the CVS and respiratory systems

## **Aim of the Module**

The aim of this module is to:

1. increase the student's depth of knowledge and understanding of the normal anatomy and physiology of the cardiovascular and respiratory systems of veterinary species;
2. develop the student's knowledge and understanding of pathological changes to the cardiovascular and respiratory systems in veterinary species

## **Learning Outcomes**

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

1. demonstrate in-depth understanding of the anatomy and physiology of the cardiovascular and respiratory systems;
2. demonstrate the ability to apply their knowledge in order to appreciate how alterations in the normal structure and function of these systems contributes to clinical disease manifestations;

3. appraise critically the literature relevant to clinical cases in the topics covered and discuss how the literature can be used to inform practice;
4. demonstrate the ability to recognise the appropriate case for onward referral.

## Module Structure

The module will be divided into 3 study units:

**Study Unit 1:** This unit will cover anatomy of the mammalian cardiovascular and respiratory systems. The focus is on the integration of structure and function at the cellular and tissue level and how this is altered during embryological development and in congenital disease states.

**Study Unit 2:** This unit will cover cardiorespiratory physiology. The focus is on physiology in the normal animal and the alterations seen in disease states or physiological alterations such as exercise and pregnancy

**Study Unit 3:** This unit will cover cardiovascular and respiratory pathology. The focus is on the pathophysiological effects of the more common disease states affecting these body systems

## Assessment Strategy

Portfolio of cases (20 case log book), 3 x short answer question and/or MCQ tests, 1 x reflective case report/essay (1500 words) and 1 x journal critique/journal club presentation (pass/fail)

**PLEASE NOTE:** It is your responsibility to ensure that you have access to sufficient appropriate cases where you were the primary decision maker to produce adequate material for the module. This may not be possible with some internship positions. You must also be aware of any limitations of your facilities that may make the accumulation of appropriate cases difficult or impossible.