Veterinary Refresher Scheme for Companion Animal Practice - Learning objectives

Module 1: Anaesthesia and critical care

Topic 1: Introduction
Review the concept of anaesthesia and its effects on body systems. Recall the preparation that is required in the period before and drug administration.

Topic 2: Premedication
Review commonly used sedatives, injectable anaesthetics and inhalation maintenance options. Premedication drugs combinations are discussed, with pros and cons, dose rates and administration techniques detailed.

Topic 3: Anaesthetic machines and breathing circuits
Refresh your memory on the parts of the anaesthetic machine, breathing circuits (re-breathing and non-rebreathing) and fresh gas flow rates. Recall the appropriate procedure used to refill the vaporiser, and change the CO2 canister. Understand the importance of and know how to perform a leak check on a circuit. Discuss endotracheal tubes, intubation and complications. Review stages and planes of anaesthesia, and options for patient monitoring, including monitoring tools, and support that may be required during the procedure.

Topic 4: Recovery
When you should be extubating, what you should be monitoring, for how long and potential complications during recovery are examined in this module. An in depth look at analgesia, including pre-emptive analgesia is undertaken.

Topic 5: Anaesthesia in paediatrics and geriatrics
Challenges around anaesthesia for paediatrics and geriatrics are discussed as well as options for small mammals and birds. A closer look at anaesthesia, the risks and management options for brachycephalics and ocular disease is undertaken.

Topic 6: Anaesthesia for compromised patients
Procedures in the pre-anaesthetic period are discussed with respect to minimising risk for the patient, support and monitoring during anaesthesia are refreshed, and specific examples are discussed in detail. These include cardiovascular (including hyperthyroid cats) and respiratory compromised patients.

Topic 7: Anaesthesia for diabetes mellitus, bleeding masses
Diaphragmatic hernia, abdominal fluid, GI disease. Discussion on the above issues in compromised patients will refresh your memory around pre-anaesthetic assessment, support and monitoring, complications to watch out for, sedation and induction choices.

Topic 8: Anaesthesia for caesarian section, urogenital disorders
Dental and oral surgery. Discussion on the above issue in compromised patients and specific procedures will refresh your memory around pre-anaesthetic assessment, support and monitoring, complications to watch out for, sedation and induction choices.

Topic 9: Triage
Confidence to assess the emergency patient, and provide support and emergency drugs will be enhanced through learnings in this module, covering the initial assessment, administration of CPR and drugs if required. Revisit shock - what are the causes, and how to assess and treat.

Topic 10: Congestive heart failure (CHF) and respiratory disorders
Examine how to manage CHF in the pre-anaesthetic period as well as discussion on some contributors to the disease process, and compromised respiratory scenarios (upper and lower airway obstruction, pyothorax, pleural effusion, pneumothorax) are reviewed. Finally a brief discussion on heat stroke and management of this condition is undertaken.

Topic 11: Coma and seizures
Review steps to take and some differentials (e.g. is this coma, or is CPR required?) to consider when presented with a patient in coma or having seizures.

Topic 12: Acute renal failure and urethral obstruction
A brief overview is given of some causes of ARF and diagnostics findings associated with the disease and precedes some practical
Module 2: Surgery

Topic 1: Basics principles of surgery
By the end of this module, the participant should be familiar with patient and surgical risk assessment, and surgical principles including Halstead's. Participants will be reminded of how to implement Halstead's Principles in practice.

Topic 2: Aseptic technique
By the end of this module, the participant should be familiar with how we prepare the theatre, the patient, instruments and ourselves for aseptic surgery.

Topic 3: Suture materials
By the end of this module, the participant should be familiar with current information on the range of suture materials available to the small animal practitioner and some guidelines of their use. It consists of two articles from the veterinary literature, which provide a detailed overview.

Topic 4: Suturing – patterns and techniques
By the end of this module, the participant should be familiar with types of knots, suture patterns including indications and contraindications for each, and techniques for abdominal wall closure.

Topic 5: Surgical techniques
By the end of this module, the participant should be familiar with surgical techniques of exploratory laparotomies (inclusive of enterotomies), GDV, ovariohysterectomies, and lateral fabellar suture. Suture choices, techniques, and behaviour of tissues involved in the above surgeries are discussed. Benefits or otherwise of early age neutering and comparison of ovariohysterectomies vs. ovarioectomies are examined.

Topic 6: Diagnosis of arthropathies in companion animal practice
By the end of this module, the participant should be familiar with common causes of arthropathies in CAP, diagnostics tools and indications for use in diagnosis, and interpretation of tests used.

Topic 7: Principles of surgical oncology
By the end of this module, the participant should be familiar with basic methods of surgical oncology and what type of resection and/or adjunctive therapy can be used in treatment of cancers. Use of India ink is discussed.

Topic 8: When to refer
By the end of this module, the participant should be familiar with clinical scenarios for which referral is recommended (both orthopaedics, including using a fracture assessment scoring system), and soft tissue scenarios, are investigated. Procedures for a neurological examination and differentials for various neurological presentations, controversy regarding use of steroids in spinal cord injured patients, and basic knowledge of fractures, repair techniques and options are examined. Some fracture repair techniques are discussed and limitations and common errors are identified.

Module 3: Clinical pathology

Topic 1: Anaemia
The learning outcomes of this module are to refresh your knowledge on regenerative and non-regenerative anaemia, and look at causes of both. There is also a brief discussion on blood typing and cross matching.

Topic 2: Erythrocytosis
This is a very short module covering off polycythaemia, and the difference between relative and absolute polycythaemia.

Topic 3: Leukocytosis
Types of neutrophilia are discussed including inflammation (acute and chronic), and leukaemia and paraneoplastic syndrome. Other more unusual causes of leukocytosis are touched on as are other white blood cell abnormalities.

Topic 4: Leukopaenia
Neutropaenia as the most common cause of leukopaenia is examined, and examples of processes that induce neutropaenia are discussed. This includes inflammation, bone marrow dysfunction, cyclic neutropaenia and auto immune destruction of neutrophils. Other white blood cell reductions are briefly examined.

Topic 5: Abnormalities in leukopaenia morphology
Toxic change and other more unusual changes are briefly discussed.

Topic 6: Clotting
A discussion on determining the primary or secondary nature of the coagulopathy begins this module. The importance of correct sampling is highlighted. Both primary and secondary types of clotting disorders and causes of these are then reviewed. Haemophilia and DIC are touched on.

Topic 7: Protein disorders
Methods for measuring total protein are discussed, and then protein components (albumin and globulins) and alterations to these are reviewed. Infection, inflammation and neoplasia...
are identified as causes of hyperglobulinaemia (polyclonal and monoclonal).

**Topic 8: Lipid abnormalities**
Lipid abnormalities are briefly discussed, including hyper and hypo-cholesterolaemia.

**Topic 9: Renal function**
Azotaemia (pre-, post-, and renal) is examined and relative usefulness of urine specific gravity (SG) is discussed. Azotaemia in the presence of normal SG is looked at and causes indicated (high serum Ca, E. coli etc.), as well as other abnormalities (electrolytes, amylase, lipase, albumin) that may be seen in association with impaired renal function.

**Topic 10: Urinalysis**
Sample collection techniques are discussed, before urinalysis, including gross examination and specific gravity and interpretation of various SGs in cats and dogs. Biochemical analysis is broken down to look at pH, and protein content of samples, as well as glucose, ketones, bilirubin and blood. Sediment examination is discussed briefly.

**Topic 11: Hepatic disorders**
Activity of various liver enzymes is reviewed, including ALT and ALP. Parameters of liver function are discussed including the use of bile acids to assess function, and how to do this.

**Topic 12: Hormone problems**
Feline hyperthyroidism and canine hypothyroidism are reviewed, as is adrenal disease in dogs. Diabetes mellitus with reference to limitations of fructosamine testing is discussed, and insulinoma as a differential to hypoglycaemia. Blood calcium irregularities are reviewed, and two papers provided regarding feline acromegaly, and feline Cushing's disease, as well as feline hyperaldosteronism.

**Topic 13: Microbiology**
Focus on sample collections and techniques for storage, handling and transport are covered, and methods for collections of all of the main specimens discussed.

**Topic 14: Serology, PCR and DNA Testing**
Discussions on serology and statistics are undertaken, with sensitivity and specificity looked at using FeLV and FIV as a case studies. The various in-house tests for are discussed that cover the commonly thought of diseases (FIV, FeLV, FIP, lepto, feline respiratory disease, panleukopaenia), as well as some more unusual diseases, such as masticatory myositis, and myasthenia gravis.

**Module 4: Medicine and practical pharmacology**

**Topic 1: Vaccination and early age neutering**
Explore the concept of early age neutering and the associated risks and benefit. Refresh your knowledge about juvenile vaccination protocols.

**Topic 2: Urogenital**

**Topic 3: Dermatology**
Review common dermatological problems that will be encountered in practice and examine some of the newer drugs now available. Work through some cases and answer the questions, assisted by directed reading of supplementary material.

**Topic 4: Cardiology**
Review mitral valve disease and explore use of pimobendan for its treatment. Secondly, explore dilated cardiomyopathy in Dobermans and exploration of ECG in its management.

**Topic 5: Gastroenterology**
Learn about a diagnostic approach to the vomiting Labrador, with pancreatitis in mind, examine Cerenia, and explore enteral nutrition and its pros and cons for these cases. Included is a brief discussion on pancreatitis in cats.

**Topic 6: Endocrinology**
Examine diabetes mellitus, and the new drug glargine, and review hyperthyroidism and treatment modalities including slow release tablets, ear spots, diet and surgery.

**Topic 7: Neurology**
The learning outcomes of this module are to refresh your knowledge on performing a neurological examination and localising a lesion and then to test your knowledge with cases.