# American College of Veterinary Internal Medicine (ACVIM)
# Small Animal Internal Medicine Exam (SAIM)
# Test Specifications

| **A. Cardiovascular** | **3%** |
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| 1. Describe the cardiac cycle | |
| 2. Describe the electrical conduction system of the heart | |
| 3. Describe the determinants of heart rate, peripheral vascular resistance, preload, and afterload | |
| 4. Recognize common congenital small animal cardiac defects (including breeds predisposed to defects) and their prognoses | |
| 5. Formulate an appropriate differential diagnosis list, treatment plan, prognosis, and monitoring plan for small animals with acquired valvular disorders | |
| 6. Achieve a diagnosis of acquired valvular disorders in small animals | |
| 7. Formulate an appropriate differential diagnosis list, treatment plan, prognosis, and monitoring plan for small animals with cardiomyopathic disease | |
| 8. Achieve a diagnosis of cardiomyopathic disease in small animals | |
| 9. Recognize cardiac neoplastic disorders in small animals and their prognoses | |
| 10. Formulate an appropriate differential diagnosis list for small animals with systemic hypertension | |
| 11. Achieve a diagnosis of systemic hypertension in small animals | |
| 12. Formulate an appropriate treatment plan and prognosis for small animals with systemic hypertension | |
| 13. Provide a monitoring plan to evaluate and adjust treatment, or complications of treatment, for small animals with systemic hypertension | |
| 14. Formulate an appropriate differential diagnosis list, treatment plan, prognosis, and monitoring plan for small animals with pulmonary hypertension | |
| 15. Achieve a diagnosis of pulmonary hypertension in small animals | |
| 16. Formulate an appropriate differential diagnosis list, treatment plan and prognosis, monitoring plan to evaluate and adjust treatment, or complications of treatment for small animals with arrhythmogenic disorders | |
| 17. Formulate an appropriate differential diagnosis list treatment plan, prognosis, monitoring plan to evaluate and adjust treatment, or complications of treatment for small animals with thromboembolic disorders | |
| 18. Achieve a diagnosis of thromboembolic disorders in small animals | |
| 19. Formulate an appropriate differential diagnosis list, treatment plan and monitoring plan to evaluate and adjust treatment, or complications of treatment, for small animals with pericardial disease | |
| 20. Achieve a diagnosis of pericardial disease in small animals | |
| 21. Recognize the most important/common breed predispositions for cardiac disease | |

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| 22. Perform and interpret an appropriate cardiac examination, including grading and classification of murmurs, recognition of pulse deficits, appreciation of femoral pulse quality, recognition or arrhythmias, and recognition of jugular vein distention and examination signs of congestive heart failure and pericardial effusion. | |
| 23. Obtain and interpret electrocardiogram (ECG) | |
| 24. Interpret heart size, heart shape, and pulmonary patterns on thoracic radiographs, to include pulmonary vasculature as well as signs of congestive heart failure | |
| 25. Interpret echocardiographic findings (e.g., reports, common images, hallmark signs) | |
| 26. Interpret blood tests associated with heart disease e.g., troponin, BNP) | |
| 27. Interpret routine laboratory results commonly identified in small animals with cardiac disease and/or on drugs prescribed to control heart disease (e.g., diuretics, RAAS inhibitors) | |
| 28. Choose appropriate indications for, and recognize adverse effects associated with, drugs used in the treatment of cardiac disease (e.g., anti-arrhythmic drugs, ACE inhibitors, diuretic drugs) | |
| 29. Choose appropriate fluid therapy for small animals with cardiac disease, including those with kidney dysfunction | |
| 30. Achieve a diagnosis of cardiac arrest and formulate an appropriate treatment plan and prognosis for small animals with cardiac arrest | |
| **B. Epidemiology/Statistics** | **2%** |
| 1. Understand the difference between prevalence and incidence when discussing population dynamics | |
| 2. Determine whether a study design is appropriate to answer the given question | |
| 3. Critically evaluate scientific manuscripts for study design flaws | |
| 4. Read and understand results of studies comparing diagnostic tests and treatment modalities | |
| 5. Define and recognize a null hypothesis | |
| 6. Calculate and understand positive predictive value and negative predictive value of a diagnostic test | |
| 7. Calculate and explain the relationship between sensitivity and specificity of tests, and how this impacts their diagnostic utility | |
| 8. Calculate mean, median, and mode | |
| 9. Interpret results when provided with the standard deviation, standard error of the mean, and a p value | |
| 10. Distinguish between statistical significance and biological relevance | |
| 11. Distinguish between qualitative and quantitative variables | |
| 12. Interpret box and whisker plots, pie charts, scatter diagrams, bar charts, histogram, linear regression graphs, Kaplan-Meier graphs, confidence intervals and understand their appropriate use | |
| 13. Recognize normally (parametric) or non-normally (non-parametric) distributed data and its implication for data analysis | |
| 14. Recognize the type of control group used in a study, and the pro's and con's of that control group (e.g., placebo controls, case control, cohort) | |
| 15. Distinguish between precision and accuracy | |

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| 16. Understand the meaning of a p value and statistical significance; interpret a result with a given p value | |
| 17. Understand what is meant by censoring in survival analysis | |
| 18. Understand the difference between causation and association | |
| 19. Understand sampling error | |
| 20. Differentiate between type 1 and type 2 error | |
| 21. Define and recognize an outlier in a data set | |
| 22. Understand what and why study blinding and randomization is used in study design | |
| 23. Describe the limitations of retrospective studies | |
| 24. Understand and recognize study bias | |
| 25. Understand and apply odds ratios | |
| 26. Understand the fundamental differences between observational and experimental studies | |
| 27. Distinguish between continuous and categorical variables | |
| 28. Recognize confounding factors | |
| 29. Understand the limitations of case series study designs | |
| 30. Understand the concept of statistical power and factors that can influence it | |
| **C. Endocrine** | **9%** |
| 1. Describe the normal physiology of main endocrine organs (e.g., thyroid, parathyroid, adrenal, pancreas) | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with thyroid-related endocrine disease | |
| 3. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with parathyroid disease | |
| 4. Achieve a diagnosis, formulate an appropriate treatment plan and prognosis for small animals with thyroid related endocrine disease | |
| 5. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with endocrine pancreatic disease | |
| 6. Achieve a diagnosis, formulate an appropriate treatment plan and prognosis for endocrine pancreatic disease in small animals | |
| 7. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with complications of diabetes mellitus (e.g., DKA, hyperosmolar syndrome, polyneuropathy, cataracts) | |
| 8. Achieve a diagnosis of sex-hormone related endocrine disorders in small animals | |
| 9. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with sex-hormone related endocrine disorders | |
| 10. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with neoplastic or paraneoplastic endocrine disease | |

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| 11. Achieve a diagnosis of neoplastic or paraneoplastic endocrine disease in small animals | |
| 12. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with neoplastic or paraneoplastic endocrine disease | |
| 13. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with disease of the pituitary gland resulting in endocrinopathy | |
| 14. Achieve a diagnosis of pituitary gland disease resulting in endocrinopathy in small animals | |
| 15. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with pituitary gland disease resulting in endocrinopathy | |
| 16. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with disease of the adrenal gland resulting in endocrinopathy | |
| 17. Achieve a diagnosis of adrenal gland disease resulting in endocrinopathy in small animals | |
| 18. Formulate an appropriate treatment plan and prognosis for small animals with adrenal gland disease resulting in endocrinopathy | |
| 19. Provide a monitoring plan to evaluate and adjust treatment, or complications of treatment, for small animals with adrenal gland disease resulting in endocrinopathy | |
| 20. Formulate an appropriate differential diagnosis list for small animals with disease of the hypothalamus resulting in endocrinopathy | |
| 21. Achieve a diagnosis of hypothalamic disease resulting in endocrinopathy in small animals | |
| 22. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypothalamic disease resulting in endocrinopathy | |
| 23. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with polyuria/polydipsia | |
| 24. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with non-pruritic alopecia | |
| 25. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with stunted/excessive growth | |
| 26. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with polyphagia | |
| 27. Perform and interpret abdominal ultrasound, including evaluation of the adrenal glands, pancreas | |
| 28. Interpret modified water deprivation and/or desmopressin response test | |
| 29. Interpret measurement of plasma and urine osmolality | |
| **D. Metabolism/Nutrition** | **5%** |
| 1. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hyperlipidemia/hypertriglyceridemia | |
| 2. Explain how carbohydrates/proteins/lipids are processed, stored and utilized within the body | |
| 3. Explain the underlying physiology/pathophysiology associated with regulation/dysregulation of gastrointestinal hormones (e.g., gastrin, cholecystokinin, secretin) | |
| 4. Select appropriate therapeutic diets for common diseases of small animals | |

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| 5. Calculate resting energy requirement for small animals | |
| 6. Choose the appropriate method of nutritional support for small animals needing assisted feeding (e.g., esophagostomy tube, PEG tube, appetite stimulant, J tube, Parenteral) | |
| 7. Describe the pathophysiology, prevention, and treatment of refeeding syndrome | |
| **E. Hepatobiliary** | **8%** |
| 1. Achieve a diagnosis of hepatobiliary disease in small animals | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hepatobiliary disease | |
| 3. Describe the pharmacologic principles, clinical indications and potential adverse effects of drugs used to treat hepatopathy (e.g., SAMe/silymarin, lactulose, milk thistle, D-penicillamine) | |
| 4. Formulate an appropriate diagnosis, treatment plan, prognosis, and management list for small animals with congenital hepatobiliary abnormalities | |
| 5. Interpret the results of liver function tests (e.g., fasting and post-prandial bile acids, ammonia, protein C) | |
| 6. Describe the pros/cons of different biopsy techniques (e.g., surgical, laparoscopic, tru-cut) | |
| 7. Interpret liver biopsy results including histopathology and copper quantification | |
| 8. Interpret liver, vascular, and biliary ultrasound and CT findings | |
| 9. Perform and interpret fine needle aspirates and microbial cultures (e.g., liver, gall bladder) | |
| 10. Formulate an appropriate nutritional plan for small animals with hepatobiliary disease | |
| **F. Exocrine Pancreatic Disorders** | **3%** |
| 1. Achieve a diagnosis of exocrine pancreatic disease in small animals | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with exocrine pancreatic disease | |
| 3. Interpret the results of exocrine pancreatic markers (e.g., PLI, TLI, PSL) | |
| **G. Gastrointestinal** | **9%** |
| 1. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with esophageal disease | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with gastric disease | |
| 3. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with small intestinal disease | |
| 4. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with large intestinal disease | |
| 5. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with recto-anal disease | |

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| 6. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals presenting with vomiting | |
| 7. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with regurgitation | |
| 8. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with dysphagia | |
| 9. Discriminate between vomiting and regurgitation | |
| 10. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with diarrhea | |
| 11. Discriminate between large and small bowel diarrhea | |
| 12. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with weight loss | |
| 13. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with constipation/obstipation | |
| 14. Understand and interpret the results of a blood and fecal markers of gastrointestinal health (e.g., folate, cobalamin, NMH, calprotectin, dysbiosis index) | |
| 15. Perform and interpret abdominal radiographs in a small animal patient | |
| 16. Interpret abdominal ultrasound in a small animal patient | |
| 17. Perform and interpret contrast-based imaging procedures (e.g., fluoroscopic swallowing studies) | |
| 18. Perform and interpret upper and lower endoscopy and sample collection | |
| 19. Perform therapeutic endoscopic procedures like foreign body retrieval and balloon dilation of esophageal or colonic strictures. | |
| 20. Understand the indication for and interpret various types of fecal analyses | |
| 21. Describe the interrelationship between gastrointestinal mucosal immunity and gastrointestinal microflora and the consequences of dysregulation of this relationship | |
| 22. Describe the pharmacologic principles, clinical indications, potential adverse effects, and be able to adjust dosages of drugs used to treat vomiting, diarrhea, inappetence, constipation, in small animals | |
| 23. Describe the pharmacologic principles, clinical indications, potential adverse effects, and be able to adjust dosages of drugs used to treat esophageal and GI ulcers and erosions, esophageal and gastrointestinal hypomotility, and other infections, inflammatory, and neoplastic diseases of the gastrointestinal tract. | |
| 24. Formulate an appropriate nutritional plan for small animals with gastrointestinal disease | |
| 25. Perform and interpret rectal scraping | |
| 26. Perform endoscopic procedures (esophagoscopy, gastroscopy, colonoscopy, cystoscopy) bronchoscopy, rhinoscopy) and obtain endoscopic biopsies | |
| **H. Hemolymphatic** | **8%** |
| 1. Perform and evaluate spun PCV and total solids determined by refractometer | |
| 2. Measure total leukocyte concentration of a blood sample and perform and interpret a leukocyte differential | |

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| 3. Prepare and interpret a peripheral blood smear (e.g., microscopic cell differentiation, manual platelet estimate) |
| 4. Accurately assess RBC morphology, including size (e.g., micro or macrocytic), shape (e.g., schistocytes, keratocytes, acanthocytes), color (e.g., hypochromasia), parasites (e.g., Babesia, M. haemofelis), or structural damage (e.g., Heinz bodies, basophilic stippling) |
| 5. Accurately assess WBC morphology, including left shift, nuclear and cytoplasmic changes, infectious organisms (toxic changes; reactive changes) |
| 6. Interpret microscopic reticulocyte enumeration in a patient with anemia |
| 7. Perform and interpret a saline slide agglutination test |
| 8. Interpret results of a Coomb's test |
| 9. Perform and interpret results of a buccal mucosal bleeding time |
| 10. Interpret results of serum protein electrophoresis |
| 11. Interpret and apply results of vWf antigen concentration and vWF collagen-binding assay |
| 12. Diagnose and manage defects of individual coagulation factors |
| 13. Explain the pathophysiology of disseminated intravascular coagulation and be able to diagnose it |
| 14. Perform and interpret an in-house major crossmatch |
| 15. Perform and interpret in-house blood typing |
| 16. Apply blood typing results to an individual patient |
| 17. Explain the principle of saline/osmotic fragility test |
| 18. Identify and interpret methemoglobinemia |
| 19. Explain principles of flow cytometry |
| 20. Interpret immunophenotyping results |
| 21. Interpret and apply results of testing for blood coagulation (PT, PTT, ACT, D-dimers, FDP, fibrinogen, thromboelastography, thromboelastometry, PFA-100) |
| 22. Explain normal coagulation including platelet function |
| 23. Interpret the results of tests of iron deficiency (serum iron, total iron-binding capacity, serum ferritin) and apply to a specific case |
| 24. Perform bone marrow aspiration and core biopsy |
| 25. Interpret the results of bone marrow cytology and bone marrow histopathology and apply to a specific case |
| 26. Formulate an appropriate differential diagnosis list for small animals with thrombocytosis and thrombocytopenia |
| 27. Achieve a diagnosis in small animals with thrombocytosis and thrombocytopenia |
| 28. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with anemia and polycythemia |
| 29. Achieve a diagnosis in small animals with anemia and polycythemia |

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| 30. Discriminate between primary, appropriate secondary, and inappropriate secondary polycythemia |
| 31. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with neutropenia and neutrophilia |
| 32. Achieve a diagnosis in small animals with neutropenia and neutrophilia |
| 33. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with eosinopenia and eosinophilia |
| 34. Achieve a diagnosis in small animals with eosinopenia and eosinophilia |
| 35. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with lymphopenia and lymphocytosis |
| 36. Achieve a diagnosis in small animals with lymphopenia and lymphocytosis |
| 37. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with hypo- and hyperglobulinemia |
| 38. Achieve a diagnosis in small animals with hypo- and hyperglobulinemia |
| 39. Describe the pharmacologic principles, clinical indications and potential adverse effects of drugs used to treat anemia or polycythemia (e.g., darbepoetin, erythropoietin, hydroxyurea) |
| 40. Describe the pharmacologic principles, clinical indications and potential adverse effects of drugs used to treat neutropenia (e.g., GCSF, antibiotics) |
| 41. Select and administer blood products (whole blood, frozen plasma, fresh frozen plasma, cryoprecipitate, packed RBCs, platelet rich plasma, platelet concentrate, cryosupernatant) |
| 42. Diagnose and manage immunologic and non-immunologic transfusion reactions |
| 43. Appropriately screen and select dogs and cats for blood donation |
| 44. Develop protocols to obtain and process blood or blood products for administration |
| 45. Perform aspiration of peripheral lymph nodes and interpret lymph node cytology results |
| 46. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with primary polycythemia |
| 47. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with immune mediated cytopenia (e.g., immune mediated hemolytic anemia, immune mediated thrombocytopenia, immune mediated neutropenia) |
| 48. Achieve a diagnosis of immune mediated cytopenia (e.g., immune mediated hemolytic anemia, immune mediated thrombocytopenia, immune mediated neutropenia) in small animals |
| 49. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with immune mediated cytopenia (e.g., immune mediated hemolytic anemia, immune mediated thrombocytopenia, immune mediated neutropenia) |
| 50. Identify and manage risk factors for thromboembolic complications |
| 51. Choose appropriate indications for, and recognize adverse effects associated with, drugs used in the treatment of thrombosis or thromboprophylaxis (e.g., heparin, low-molecular weight heparin, direct factor Xa inhibitors, warfarin, aspirin, clopidogrel, streptokinase, tissue plasminogen activator) |
| 52. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with inherited blood disorders (e.g., Chediak-Higashi, pyruvate kinase deficiency, Glanzmann's thrombasthenia) |

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| 53. Achieve a diagnosis of inherited blood disorders (e.g., Chediak-Higashi, pyruvate kinase deficiency, Glanzmann's thrombasthenia) in small animals | |
| 54. Recognize non-pathologic lesions of blood cells (e.g. Pelger-Huët anomaly, congenital macrothrombocytopenia, etc.) | |
| 55. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with inherited blood disorders (e.g., Chediak-Higashi, pyruvate kinase deficiency, Glanzmann's thrombasthenia) | |
| 56. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with lymphatic disorders | |
| 57. Achieve a diagnosis of lymphatic disorders in small animals | |
| 58. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with lymphatic disorders | |
| **I. Immunology** | **6%** |
| 1. Differentiate between immune-mediated disease, auto-immune disease, immunodeficiency and hypersensitivities | |
| 2. Differentiate the pathophysiologic mechanisms and clinical manifestations of hypersensitivities | |
| 3. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with immune mediated disease (e.g., immune mediated hemolytic anemia, immune mediated vasculitis, pemphigus) | |
| 4. Understand emerging treatments for immunologic diseases (e.g., therapeutic plasmapheresis, stem cells, IVIG therapy) | |
| 5. Achieve a diagnosis of immune mediated disease in small animals (e.g., immune mediated hemolytic anemia, immune mediated vasculitis, pemphigus) | |
| 6. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan to evaluate treatments for small animals with a hypersensitivity related disease (e.g., asthma, atopy, anaphylaxis) | |
| 7. Achieve a diagnosis of hypersensitivity related disease (e.g., asthma, atopy, anaphylaxis) in small animals | |
| 8. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with immunodeficiency states | |
| 9. Achieve a diagnosis of immunodeficiency states in small animals | |
| 10. Recognize breed predispositions to hereditary immunodeficiency diseases that affect small animal patients | |
| 11. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hemolymphatic neoplasia | |
| 12. Interpret tests for immune mediated disease (e.g., Coomb's test, antinuclear antibody test, rheumatoid factor test) | |
| 13. Perform and interpret cross match for transfusion, and know when it is necessary | |
| 14. Interpret alterations on routine laboratory testing that might imply immunologic disorders (e.g., spherocytosis, agglutination, lupus cells, proteinuria) | |

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| 15. Understand when to use immunologic and molecular diagnostic techniques (e.g., immunohistochemistry, ELISA test for antibody or antigen), and the limitations of these tests | |
| 16. Choose appropriate indications for, and recognize adverse effects associated with, vaccination | |
| 17. Choose appropriate indications for, and recognize adverse effects associated with immunomodulatory drugs (e.g., interferon, cyclosporine, Mycophenolate mofetil, hypo-sensitization therapy) | |
| 18. Be able to choose an appropriate preparation, dose, route, and course of glucocorticoid drugs for the management of inflammatory or immunologically mediated disease (e.g., oral prednisolone at a variety of dosages) | |
| 19. Describe the interrelationship between innate and adaptive immunity and the consequences of dysregulation of this relationship | |
| 20. Demonstrate awareness of immunologic interactions with systemic disease during disease treatment (e.g., recognize the possible immunologic component of myasthenia gravis, recognize the effect of anti-thyroglobulin antibodies on thyroid testing) | |
| 21. Perform arthrocentesis | |
| **J. Infectious Disease** | **8%** |
| 1. Obtain and safely handle appropriate biological samples for culture (e.g., blood culture, joint culture, culture of peritoneal and pleural fluids, culture of bile, urine culture, and culture of airway lavage fluid) | |
| 2. Recognize and apply cytologic findings suggestive of infection from various sites (e.g., urinalysis with gram stain, diagnostic peritoneal lavage, thoracic fluid analysis, CSF analysis, arthrocentesis, alveolar lavage) | |
| 3. Interpret culture and susceptibility profiles for bacterial cultures (e.g., make appropriate antimicrobial choices for a given pathogen in a given location, dose range of antimicrobial therapy) | |
| 4. Interpret results of serologic assays (including recognition that negative tests may be due to acute infection or that positive tests may not equate to active infection) | |
| 5. Interpret results of PCR test results (including understanding that negative PCR cannot be used to rule out infection) | |
| 6. Understand the limitations to commonly used diagnostic testing methods for infectious disease (e.g., routine laboratory tests such as blood counts or parasite exams, cytologic tests including Gram stain, serologic tests, PCR tests) | |
| 7. Choose and interpret other diagnostic tests for infectious disease, including recognition of limitations of each test (e.g., Baermann sedimentation, immunohistochemistry tests, viral culture) | |
| 8. Council pet owners on prevention of infectious disease (e.g., vaccination program implementation, ectoparasite control programs, avoiding raw diets, avoiding stagnant water for swimming) | |
| 9. Council pet owner regarding zoonosis prevention, including for households with immunosuppressed members | |
| 10. Recognize potential for zoonotic infection for any given patient | |
| 11. Maintain biosecurity protocols in various situations (kennel, cattery, animal shelter) to prevent disease transmission, including zoonosis | |
| 12. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for bacterial infection in small animals (e.g., pyothorax, bacterial peritonitis, septic arthritis, bacterial pneumonia) | |

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| 13. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for vector transmitted infections in small animals (e.g., Lyme, Ehrlichia, Leishmania, Anaplasma) | |
| 14. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for viral infections in small animals (e.g., FeLV, FIP, distemper virus, parvovirus) | |
| 15. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for protozoal infections in small animals (e.g., babesiosis, cytauxzoonosis, giardiasis) | |
| 16. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for fungal infections in small animals (e.g., blastomycosis, cryptococcosis, histoplasmosis, aspergillosis) | |
| 17. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for parasitic infections in small animals (e.g., heartworm, physaloptera, lung worms, intestinal worms) | |
| 18. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for algal infections in small animals (e.g., pythiosis, zygomycosis) | |
| 19. Choose appropriate antimicrobial therapy and route of administration if provided with likely pathogen, site of infection, +/- other relevant factors (e.g., co-morbid disease) | |
| 20. Avoid or mitigate adverse effects of antimicrobial drugs (e.g., avoid nephrotoxic drugs in animals with renal disease, avoid use of fluoroquinolone in animals receiving methylxanthines) | |
| 21. Recognize treatment failures or antimicrobial resistance and alter therapy accordingly | |
| 22. Recognize the potential role of biofilms in antimicrobial resistance and treatment failures | |
| 23. Adjust drug type/dose/administration based on a variety of relevant factors (e.g., renal dysfunction, presence of vomiting) | |
| 24. Recognize geographic implications for infectious disease (e.g., endemic regions, vector transmission) | |
| 25. Recognize breed predispositions for infectious disease (e.g., systemic aspergillosis in German shepherds, Pneumocystis in miniature dachshunds and CKCS) | |
| 26. Recognize vectors for infectious disease (e.g., mosquitoes transmit heartworm, Lone star ticks transmit cytauxzoonosis, brown dog ticks transmit E. canis) | |
| **K. Oncology** | **4%** |
| 1. Interpret advanced imaging to identify and stage neoplastic disease (e.g., CT, MR) | |
| 2. Interpret cytologic findings from needle aspirates suggestive of the most common/important tumor types (e.g., lymphoma, mast cell tumor, melanoma, carcinoma, sarcoma) | |
| 3. Perform prostatic wash and diagnostic catheterization of prostatic or bladder masses | |
| 4. Perform thoracocentesis/abdominocentesis/pericardiocentesis | |
| 5. Perform fine needle aspiration (including ultrasound-guided) | |
| 6. Perform and interpret pathologic reports from needle core soft tissue biopsy | |
| 7. Explain the concept and use of flow cytometry and PARR and appropriate sample handling | |
| 8. Conduct appropriate diagnostic tests to identify cancer metastasis (i.e., understand where/how to evaluate for metastasis of various cancer types) | |
| 9. Perform clinical staging of different tumor types according to WHO guidelines | |

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| 10. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with different tumor types (e.g., sarcoma, carcinoma, round cell tumors) | |
| 11. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with lymphoma | |
| 12. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hematologic malignancy | |
| 13. Achieve a diagnosis in small animals with paraneoplastic syndromes | |
| 14. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with paraneoplastic syndromes | |
| 15. Provide a prognosis for a given patient with common neoplastic disease (e.g., common lymphoma, mast cell, hemangiosarcoma) | |
| 16. Recognize and implement strategies to avoid neoplastic disease or its consequences (e.g., vaccination in the distal limb of cats, prevention of FeLV in cats, minimization of cytotoxic drug and radiation exposure) | |
| 17. Choose appropriate indications for, and recognize adverse effects associated with, cytotoxic drugs | |
| 18. Choose appropriate indications for, and recognize adverse effects associated with, non-cytotoxic drugs used in the treatment of neoplastic or paraneoplastic disease (e.g., toceranib, imatinib, streptozotocin, melanoma vaccine) | |
| 19. Perform and interpret appropriate tests to assess for toxicity of drugs used in the treatment of cancer | |
| 20. Interpret appropriate tests to assess for progression or regression of cancer | |
| 21. Formulate an appropriate analgesic plan for a cancer patient | |
| **L. Genetics/Molecular Biology** | **2%** |
| 1. Council the owners of any dog or cat affected with a genetically inherited disorder | |
| 2. Be able to choose when and what genetic testing is appropriate for small animals when genetic defects are included on the list of differential diagnosis (e.g., Von Willibrand disease, pyruvate kinase deficiency, cystinuria) | |
| 3. Recognize external traits associated with genotypes that may also related to disease or disease predisposition in dogs or cats (e.g., white cats and deafness, diluted coat colors, hairless dogs) | |
| 4. Formulate an appropriate differential diagnosis list for small animals with inherited disease (e.g., lysosomal storage diseases, coagulopathies, enzyme deficiencies, exercise induced collapse) | |
| 5. Achieve a diagnosis of inherited disease in small animals (e.g., lysosomal storage diseases, coagulopathies, enzyme deficiencies, exercise induced collapse) | |
| 6. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with inherited disease (e.g., lysosomal storage diseases, coagulopathies, enzyme deficiencies, exercise induced collapse) | |
| 7. Choose when/which molecular diagnostics are appropriate for animals with disease | |
| 8. Interpret the results of molecular diagnostics tests, including recognizing the limitation of such tests | |
| 9. Choose when pharmacogenomics testing is appropriate (e.g., collie dogs prior to certain chemotherapy treatment) | |

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| 10. Recognize the most common/important breed predispositions to genetic disease (e.g., thrombasthenia in Otterhounds, copper toxicosis in Bedlington terriers, phosphofructokinase deficiency in springer spaniels) | |
| **M. Reproduction** | **1%** |
| 1. Recognize and treat endocrine disease associated with pregnancy or parturition (e.g., hypoglycemia, diabetes mellitus, hypocalcemia) | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals presenting with mammary concerns | |
| 3. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for male and female dogs with feminizing syndrome | |
| 4. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with reproductive neoplasia (e.g., prostatic carcinoma, transmissible venereal tumor, Sertoli cell tumor) | |
| 5. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with contagious or infectious reproductive disease (e.g., brucellosis, bacterial vaginitis, prostatitis, pyometra, orchitis) | |
| **N. Respiratory** | **7%** |
| 1. Perform an appropriate examination for dogs or cats presented for nasal signs, to include evaluation of air flow, facial deformity, ability to retropulse the eyes, condition of the teeth, maxilla, palate, and nasal pigmentation | |
| 2. Evaluate whether nasal signs are more likely due to nasal diseases or systemic disease based upon clinical findings | |
| 3. Perform and interpret a laryngeal exam, including functional exam evaluation of laryngeal function | |
| 4. Obtain and interpret assessments of oxygenation (e.g., arterial blood gas, including calculation of A-a gradient, pulse oximetry) | |
| 5. Perform and interpret traceobronchoscopy, bronchoalveolar, and tracheal lavage | |
| 6. Interpret thoracic and nasal CT | |
| 7. Perform and interpret fine needle aspirate of the lungs | |
| 8. Perform rhinoscopy and obtain nasal biopsy and minimize the chances of uncontrolled hemorrhage | |
| 9. Describe the diagnostic and therapeutic indications for trephination | |
| 10. Perform appropriate tests for infectious respiratory disease (e.g., Baermann fecal, heat-treated heart worm antigen, urinary blastomycosis titer) | |
| 11. Perform and interpret an appropriate pulmonary examination, including recognition of adventitial lung sounds and recognition of respiratory patterns | |
| 12. Recognize when abnormal respiratory patterns are due to non-respiratory disease (e.g., anemia, pain, acidosis, ascites) | |
| 13. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with chronic or acute cough | |

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| 14. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with unilateral and bilateral nasal discharge/sneezing/epistaxis | |
| 15. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals respiratory distress or tachypnea | |
| 16. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with cyanosis | |
| 17. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with upper airway disease (e.g., nasal neoplasia, laryngeal paralysis, nasopharyngeal polyp) | |
| 18. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with lower airway disease (e.g., tracheal collapse, asthma, chronic bronchitis) | |
| 19. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan small animals with lung disease (e.g., pulmonary edema (cardiogenic and non-cardiogenic), pneumonia (infectious and non-infections) | |
| 20. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with pleural space disease (e.g., pyothorax, chylothroax, pneumothorax) | |
| 21. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with mediastinal mass | |
| 22. Choose appropriate indications for, and recognize adverse effects associated with, bronchodilator drugs (e.g., terbutaline, aminophylline, albuterol) | |
| 23. Choose appropriate indications for, and administration plan for, oxygen therapy | |
| 24. Choose appropriate indication for, and recognize complications of, ventilator support | |
| 25. Choose appropriate indications for, and recognize complications of nebulization | |
| 26. Choose appropriate indication for anti-infective drugs and protocols for small animals with respiratory disease (e.g., heart worm adulticide therapy, antimicrobials for pneumonia, topical antifungal therapies for mycotic rhinitis) | |
| 27. Perform tracheobronchoscopy and bronchoalveolar lavage | |
| **O. Pharmacology/Toxicology** | **4%** |
| 1. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with intoxication (e.g., poisons, environmental contaminants) | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with anaphylaxis | |
| 3. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with drug-related adverse reactions, including hypersensitivity | |
| 4. Use information provided regarding pharmacokinetic variable to choose appropriate dosing strategies for drugs | |
| 5. Recognize and avoid/mitigate adverse drug interactions (e.g., gastric acid inhibitors with sucralfate, theophylline with fluoroquinolones) | |
| 6. Recognize and avoid/mitigate harm from pharmaceutic, pharmacokinetic, and pharmacodynamics drug interactions | |
| 7. Choose an appropriate dosing strategy for an antimicrobial if provided with minimum inhibitory concentration for a pathogen and site of infection | |

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| 8. Choose appropriate indications for, and recognize adverse effects associated with, anti-infective drugs (e.g., anti-viral drugs, antibiotics, antifungals) |
| 9. Choose appropriate indications for, and recognize adverse effects associated with, anti-inflammatory drugs (e.g., COX inhibitors, LOX inhibitors, glucocorticoids) |
| 10. Choose appropriate indications for, and recognize adverse effects associated with, antineoplastic drugs (e.g., cytotoxic drugs, inhibitors of angiogenesis) |
| 11. Choose appropriate indications for, and recognize adverse effects associated with, antioxidant activity (e.g., acetylcysteine, SAMe, denamarin) |
| 12. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting coagulation (e.g., heparin, clopidogrel, rivaroxaban, tranexamic acid) |
| 13. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting gastrointestinal function (e.g., antiemetics, gastric acid inhibitors, pro and anti-motility agents) |
| 14. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting hepatic, pancreatic, or biliary function (e.g., hepatoprotectants, pancreatic enzyme supplementation, oral antiglycemic agents) |
| 15. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting cardiovascular function (e.g., diuretic, vasodilators, inotropes) |
| 16. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting the neuromuscular system (e.g., anticonvulsants, acetylcholinesterase inhibitors) |
| 17. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting the respiratory system (e.g., bronchodilators, cough suppressants) |
| 18. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting the endocrine systems (e.g., insulin, trilostane, DOCP) |
| 19. Choose appropriate indications for, and recognize adverse effects associated with, analgesic drugs (e.g., NSAIDs, tramadol, butorphanol) |
| 20. Choose appropriate indications for, and recognize adverse effects associated with, sedative and anesthetic drugs (e.g., acepromazine, propofol, dexmedetomidine) |
| 21. Choose appropriate indications for, and recognize adverse effects associated with, drugs impacting the urinary system (e.g., diuretics, ACE inhibitors, alopurinol) |
| 22. Choose appropriate indications for, types of, and dosing strategies, and recognize adverse effects associated with, glucocorticoids |
| 23. Choose appropriate indications for, recognize adverse effects associated with, and plan for dose adjustment to immunomodulatory drugs (e.g., leflunomide, cyclosporine, Mycophenolate) |
| 24. Choose appropriate drugs based on patient signalment (e.g. breed, pregnancy status, age) |
| **P. Fluid/Electrolyte/Acid Base** **6%** |
| 1. Perform proper collection technique for venous and arterial blood gas analysis samples |
| 2. Properly administer fluids by subcutaneous, intravenous, intraosseous & intraperitoneal routes |
| 3. Maintain catheters in such a way as to minimize the risk of complications |
| 4. Recognize shock and classify the likely pathophysiologic mechanism |

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| 5. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals in shock |
| 6. Recognize dehydration/hypovolemia and estimate its severity |
| 7. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for dehydration/hypovolemia in small animals |
| 8. Recognize systemic inflammatory response syndrome (SIRS) |
| 9. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for animals with SIRS |
| 10. Distinguish between primary and compensatory acid-base perturbations |
| 11. Determine if acidosis is metabolic, respiratory, or mixed in nature |
| 12. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with acidosis or alkalosis |
| 13. Understand the determinants involved in calculating anion gap |
| 14. Formulate an appropriate differential diagnosis list for small animals with an increased anion gap |
| 15. Calculate serum osmolality |
| 16. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with an abnormal osmolality |
| 17. Choose appropriate indications for, and recognize adverse effects associated with, supplemental electrolytes (e.g., potassium, phosphate) |
| 18. Choose appropriate indications dose, and rate for, and recognize adverse effects associated with bicarbonate therapy |
| 19. Choose appropriate indications, dose, and rate for, and recognize adverse effects associated with, crystalloid fluids (e.g., LRS, hypertonic saline, normal saline) |
| 20. Choose appropriate fluid therapy for small animals with electrolyte or acid-base disorders |
| 21. Choose an appropriate fluid therapy plan for small animals with reduced colloid oncotic pressure |
| 22. Choose appropriate indications for, and recognize adverse effects associated with, blood products (e.g., whole blood, plasma, canine or human albumin) |
| 23. Recognize fluid over-load, and institute appropriate counter measures |
| 24. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with peripheral edema or ascites |
| 25. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hyperviscosity |
| 26. Formulate an appropriate differential diagnosis, treatment plan and prognosis list for small animals with hepatorenal syndrome |
| 27. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hyperkalemia |
| 28. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hypernatremia |
| 29. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hypercalcemia |

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| 30. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hypomagnesaemia | |
| 31. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hypoglycemia | |
| 32. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hyperchloremia | |
| 33. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hypo or hyperphosphatemia | |
| **Q. Dermatology** | **1%** |
| 1. Identify the cutaneous manifestations of systemic illness (e.g., endocrinopathies, mycotic infection, vasculitis, liver disease, drug reactions, immune-mediated dermatopathy) | |
| 2. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with hepatocutaneous syndrome | |
| 3. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with calcinosis cutis | |
| 4. Formulate an appropriate differential diagnosis and diagnostic plan for small animals with a cutaneous mass | |
| 5. Describe the pharmacologic principles, clinical indications and potential adverse effects of drugs commonly used to treat dermatologic conditions (e.g., ivermectin, cyclosporine, oclacitinib) | |
| 6. Perform a skin biopsy for histopathology and culture (bacterial and fungal) | |
| 7. Perform and interpret fine needle aspirate from cutaneous mass | |
| **R. Neuromuscular/Neurology** | **4%** |
| 1. Obtain an appropriate history for animals with neurologic deficits or disorders (e.g., seizure, mentation change, paresis) | |
| 2. Discriminate between seizures, tremors, narcolepsy, and syncope | |
| 3. Assess level of consciousness | |
| 4. Based on neurologic examination, be able to localize neurologic lesion(s) | |
| 5. Discriminate between central nervous system, peripheral nervous system, or neuromuscular disease, endocrine, or metabolic disorders that mimic CNS abnormalities | |
| 6. Discriminate between sympathetic or parasympathetic nervous system disorders | |
| 7. Discriminate between central and peripheral causes of vestibular disease | |
| 8. Choose when MRI is indicated for animals with suspected neurologic disease, and understand the limitations of its use | |
| 9. Choose when CT is indicated for animals with suspected neurologic disease, and understand the limitations of its use | |
| 10. Choose appropriate indications for, and recognize adverse effects associated with, anticonvulsant drugs | |

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| 11. Choose appropriate indications for, and recognize adverse effects associated with, drugs that act on nerves, muscles, or at the neuromuscular junction | |
| 12. Choose drugs appropriate for use in treatment of central nervous system disease (e.g., antimicrobials that can penetrate blood-brain barrier if necessary) | |
| 13. Formulate an appropriate differential diagnosis list for small animals with altered states of consciousness (e.g., stupor, coma) | |
| 14. Achieve a diagnosis of altered states of consciousness in small animals (e.g., stupor, coma) | |
| 15. Formulate an appropriate differential diagnosis list for small animals with seizures, to include systemic and central nervous system disorders (e.g., structural or inflammatory brain disease, electrolyte disorders, toxins) | |
| 16. Achieve a diagnosis of seizures in small animals | |
| 17. Formulate an appropriate treatment plan and prognosis for small animals with seizures | |
| 18. Provide a monitoring plan to evaluate and adjust treatment, or complications of treatment, for small animals with seizure disease | |
| 19. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with cranial nerve deficits | |
| 20. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with altered mentation | |
| 21. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with vestibular disease | |
| 22. Achieve a diagnosis for nystagmus in small animals | |
| 23. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals with weakness | |
| 24. Identify co-morbid conditions in small animals with neurologic or neuromuscular disease | |
| 25. Recognize common/important breed predispositions for neurologic disease | |
| **S. Urinary** | **9%** |
| 1. Interpret urinalysis, considering method of collection | |
| 2. Interpret a urine culture and sensitivity including MIC, MUC, and antimicrobial breakpoints | |
| 3. Perform urinary catheterization (e.g., male and female, dog and cat) | |
| 4. Interpret diagnostic imaging of the urinary tract (e.g., routine studies, ultrasound, CT, intravenous urogram (IVU) and retrograde urethrogram/vaginourethrocystogram) | |
| 5. Perform and interpret cystoscopy/vaginoscopy including biopsy | |
| 6. Describe indications/contraindications for kidney biopsy and interpret the results | |
| 7. Calculate fractional excretion of urine solutes and interpret the results knowing the potential uses and limits | |
| 8. Recognize the factors that impact glomerular filtration rate, and how these factors may be manipulated | |
| 9. Recognize the factors that impact urine concentration, and how these factors may be manipulated | |

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| 10. Recognize the indications for, and limitations to, interpretation of the many techniques for measurement of GFR (e.g., Plasma clearance (inulin, iohexol, creatinine) urinary clearance (inulin, creatinine), renal scintigraphy) |
| 11. Apply IRIS (international renal interest society) staging to dogs and cats with chronic kidney disease (CKD) |
| 12. Apply IRIS grading of dogs/cats with acute kidney injury (AKI) |
| 13. Recognize the indications for, and limitations to measurement of markers of tubular dysfunction (e.g., SDMA, NGAL, and GGT) |
| 14. Differentiate acute from chronic kidney disease |
| 15. Formulate an appropriate differential diagnosis list for small animals with azotemia |
| 16. Achieve a diagnosis of chronic kidney disease in small animals |
| 17. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with chronic kidney disease recognizing and appropriately address pathologic consequences of renal disease (e.g., anemia d/t erythropoietin deficiency, aberrations in calcium and parathyroid hormone concentrations, systemic hypertension) |
| 18. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with acute kidney injury |
| 19. Recognize the indications for, and limitations to diagnostics that help determine the cause of acute kidney injury in small animals (e.g., abdominal ultrasound, urine culture, leptospiral testing, tests for ethylene glycol) |
| 20. Know appropriate measures to provide for protection and welfare of both the patient with leptospirosis induced acute kidney injury, and for other animals and humans exposed to that patient |
| 21. Formulate an appropriate treatment plan and prognosis for small animals with acute kidney injury including the indications for and limitations to the use of antidotes for nephrotoxicants, blood purification, and renal replacement therapies |
| 22. Formulate a monitoring plan to evaluate and adjust treatment, or complications of treatment, for small animals with acute kidney injury |
| 23. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with abnormalities recognized on urinalysis (e.g., hematuria, pyuria, crystalluria, glucosuria, pigmenturia, proteinuria) |
| 24. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with primary tubular disease (e.g., Fanconi syndrome, cystinuria, proximal or distal renal tubular acidosis) |
| 25. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with renomegaly, renal asymmetry or small kidneys |
| 26. Formulate an appropriate treatment plan and prognosis for small animals with renal neoplasia |
| 27. Formulate an appropriate treatment plan and prognosis for small animals with lower urinary tract obstruction (e.g., neoplasia, stricture, inflammation, urolithiasis) |
| 28. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with nephrolithiasis/ureterolithiasis/cystolithiasis |
| 29. Perform urolith hydropulsion |

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| 30. Recognize the indications for, and limitations to techniques for urolith removal (e.g., basket retrieval, laser lithotripsy, shockwave lithotripsy, urolith hydropropulsion, percutaneous cystolithotomy, cystotomy) |
| 31. Recognize the indications for, and limitations to techniques to treat ureteral obstructions (e.g., ureteral stenting, SUB placement, ureterotomy) |
| 32. Formulate an appropriate medical and dietary treatment plan and prognosis for small animals with nephrolithiasis/ureterolithiasis/cystolithiasis |
| 33. Formulate a monitoring plan to evaluate and adjust medical and dietary treatment, or complications of treatment, for small animals with nephrolithiasis/ureterolithiasis/cystolithiasis |
| 34. Recognize the indications for, and limitations to techniques to treat urethral obstructions (urethral ballooning, urethral stenting, urethral lasering) |
| 35. Recognize important/common breed predispositions to urinary tract disease (e.g., Persian cats and polycystic kidney disease, Dalmatian dogs and urate urolithiasis) |
| 36. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with familial renal disease (e.g., polycystic kidney disease, Wheaten protein losing nephropathy) |
| 37. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with proteinuria |
| 38. Interpret urine protein concentrations including the urine protein to creatinine ratio |
| 39. Formulate an appropriate treatment plan and prognosis for small animals with protein losing nephropathy (including nephrotic syndrome) disease |
| 40. Formulate a monitoring plan to evaluate and adjust treatment, or complications of treatment, for small animals with protein losing nephropathy (including nephrotic syndrome) |
| 41. Formulate an appropriate differential diagnosis list and diagnostic plan for small animals polyuria and/or polydipsia |
| 42. Recognize the indications for, risks, and limitations to diagnostics for polyuria/polydipsia (e.g., calculated plasma osmolality, modified water deprivation test, DDAVP trial) |
| 43. Formulate a monitoring plan for small animals receiving a modified water deprivation test and DDAVP trial |
| 44. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with infectious upper or lower urinary tract disease (e.g., pyelonephritis, fungal cystitis, sporadic bacterial cystitis, recurrent bacterial cystitis, subclinical bacteriuira) |
| 45. Recognize the indications for and risks to treating or monitoring bacteriuria |
| 46. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with infectious upper or lower urinary tract disease (e.g., pyelonephritis, fungal cystitis, sporadic bacterial cystitis, recurrent bacterial cystitis, subclinical bacteriuira) |
| 47. Formulate an appropriate differential diagnosis list and achieve a diagnosis for cats with FLUTD signs |
| 48. Formulate an appropriate treatment plan and prognosis for cats with FIC |
| 49. Formulate a monitoring plan to evaluate and adjust treatment, or complications of treatment, for cats with FIC |
| 50. Formulate an appropriate differential diagnosis list and achieve a diagnosis for small animals with micturition disorders |

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| 51. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with micturition disorders | |
| 52. Recognize the indications for and limitations to techniques to treat micturition disorders (e.g., urethral bulking injections, surgical techniques including culposuspension and ureteral reimplantation, hydraulic occluder device placement, laser ablation of ectopic ureters) | |
| **T. Ophthalmology** | **1%** |
| 1. Identify the ophthalmic manifestations of systemic illness (e.g., endocrinopathies, mycotic infection, vasculitis, renal disease) | |
| 2. Perform and interpret direct and indirect fundoscopy | |
| 3. Perform and interpret basic ocular diagnostics (e.g., tonometry, Schirmer tear test, anterior chamber evaluation, fluorescence stain, corneal evaluation) | |
| 4. Discriminate between central and ocular blindness | |
| 5. Formulate an appropriate differential diagnosis list for small animals with mydriasis | |
| 6. Formulate an appropriate differential diagnosis list for small animals with miotic pupils | |
| 7. Formulate an appropriate differential diagnosis list for small animals with anisocoria | |
| 8. Formulate an appropriate differential diagnosis list for small animals with absent pupillary light response (PLR) | |
| 9. Formulate an appropriate differential diagnosis list for small animals with sudden onset blindness | |
| 10. Formulate an appropriate differential diagnosis list for small animals with retinal vascular abnormalities (e.g., tortuous vessels, petechial hemorrhages) | |
| 11. Formulate an appropriate differential diagnosis list for small animals with retinal detachment | |
| 12. Achieve a diagnosis in small animals with uveitis | |
| 13. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with uveitis | |
| 14. Achieve a diagnosis of infectious ocular disease in small animals (e.g., herpes virus, blastomycosis) | |
| 15. Formulate an appropriate differential diagnosis list, prognosis, treatment, and monitoring plan for small animals with infectious ocular disease (e.g., herpes virus, blastomycosis) | |
| 16. Formulate an appropriate differential diagnosis list for small animals with Horner's syndrome | |
| 17. Achieve a diagnosis for Horner's syndrome in small animals | |
| 18. Understand the ocular impact of drugs (e.g., enrofloxacin in cats, TMS, atropine on tear production) | |