American College of Veterinary Internal Medicine (ACVIM)
General - Small Animal Internal Medicine Exam (GEN-SAIM)
Test Specifications

I. General Section	**50%**
A. Cardiology	**5.5%**
1. Describe the cardiac cycle	
2. Describe the electrical conduction system, including the cardiac action potentials	
3. Describe the determinants of heart rate, cardiac output, peripheral vascular resistance, preload, and afterload	
4. Describe pathophysiology of left- and right- sided congestive heart failure	
5. Describe the components of a normal electrocardiogram (ECG)	
6. Recognize blood-based biomarkers associated with heart disease (e.g., troponin, NT-pro BNP)	
7. Describe pharmacology of therapeutics used in the treatment of cardiac disease (e.g., anti-arrhythmic drugs, ACE inhibitors, diuretic drugs, omega-3 fatty acids)	
B. Endocrine	**6%**
1. Describe the normal physiology of the thyroid gland	
2. Describe the normal physiology of the parathyroid gland	
3. Describe the normal physiology of the adrenal gland	
4. Describe the normal physiology of the endocrine pancreas	
5. Describe the normal physiology of the hypothalamic pituitary axis	
6. Recognize endocrine effects of adipose tissue	
7. Describe physiologic effects of endocrine hormones (e.g., steroidal, nonsteroidal)	
C. Gastrointestinal/Hepatobiliary	**6.5%**
1. Explain the production and function of GI hormones	
2. Describe the anatomy and physiology of the liver and biliary system	
3. Describe the anatomy and physiology of the monogastric gastrointestinal system	
4. Describe the anatomy and physiology of the exocrine pancreas	
5. Describe the role of the liver in drug and toxin metabolism and excretion	
6. Describe bile acid metabolism	
7. Explain digestion and absorption of macro-nutrients (i.e., protein, fat, fiber, and carbohydrate)	

8. Explain digestion and absorption of micro-nutrients (e.g., vitamins and minerals)	
9. Discriminate between mechanisms of vomiting and regurgitation	
10. Discriminate between mechanisms of diarrhea	
11. Recognize indications for various types of fecal analyses	
12. Describe pharmacology of therapeutics used in the treatment of gastrointestinal and hepatobiliary disease (e.g., gastro-protectants, motility modifiers, anti-emetics, probiotics)	
D. Hemolymphatic/Immunology	**5.5%**
1. Differentiate between primary and secondary hemostasis	
2. Differentiate between innate vs. acquired immunity	
3. Describe the roles of cytokines and chemokines	
4. Explain the pathophysiology of hypersensitivity reactions	
5. Recognize mechanisms of inflammation and fever	
6. Recognize the mechanisms of anemia	
7. Describe the maturation process of blood cell lines in bone marrow	
8. Describe principles of major and minor cross match	
9. Recognize principles of immunologic and molecular diagnostic techniques (e.g., immunohistochemistry, ELISA test for antibody or antigen), and the limitations of these tests	
10. Describe the role of the immune system in cancer development and progression	
11. Recognize the mechanisms of cell death (e.g., apoptosis, autophagy, necrosis)	
12. Describe pharmacology of therapeutics used in the treatment of immune-related or hematologic disease (e.g., vaccines, immunosuppressants, anti-inflammatories)	
13. Describe mechanisms and types of edema and effusions	
14. Describe the characteristic features of the immunoglobulin classes	
E. Nephrology/Urology	**6%**
1. Describe anatomy and physiology of the urinary system (e.g., RAAS system, counter current exchange, electrolyte handling)	
2. Recognize mechanisms of urinalysis abnormalities (e.g., proteinuria, glucosuria, pigmenturia)	
3. Recognize factors that impact urine concentration	
4. Describe the mechanisms of polyuria/polydipsia	
5. Describe the physiology of micturition	
6. Recognize factors that impact glomerular filtration rate	
7. Describe the renal regulation of acid-base status	
8. Describe the role of the kidney in drug and toxin excretion	
9. Differentiate between acute kidney injury vs. chronic kidney disease	

10. Describe pharmacology of therapeutics used in the treatment of urologic disease (e.g., diuretics, fluid therapy, continence)	
F. Neurology/Musculoskeletal	**5%**
1. Determine neuro-localization based on neurologic examination findings	
2. Describe the anatomy and physiology of sympathetic and parasympathetic nervous systems	
3. Describe the physiology of neuronal conduction and synaptic transmission	
4. Describe the cellular anatomy and physiology of the neuromuscular junction and normal muscle cell physiology	
5. Recognize mechanisms and effects of neurotoxins	
6. Describe pharmacology of therapeutics used in the treatment of neurologic disease and the role of the blood brain barrier	
G. Nutrition/Metabolism	**4%**
1. Describe mechanisms of appetite regulation	
2. Recognize components of the nutritional assessment	
3. Recognize factors that impact maintenance energy requirements	
4. Recognize key pathways of cellular glucose, protein and lipid metabolism	
5. Describe pathophysiology of starvation and refeeding syndrome	
6. Describe mechanisms of calcium, phosphorus, magnesium, and vitamin D homeostasis	
H. Respiratory	**5.5%**
1. Describe the anatomy and physiology of the respiratory system	
2. Interpret assessments of oxygenation (e.g., arterial blood gas, including calculation of A-a gradient, pulse oximetry)	
3. Describe findings from respiratory examination, including upper airway sounds, lung sounds, and respiratory patterns	
4. Describe the mechanisms of cough	
5. Describe the pulmonary regulation of acid-base status	
6. Describe pharmacology of therapeutics used in the treatment of respiratory disease (e.g., bronchodilators, anti-tussives)	
I. Pan-Systemic	**3.5%**
1. Recognize basic terminology of the microbiome (e.g., alpha diversity, beta diversity, gamma diversity)	
2. Describe mechanisms of pathogenicity of bacterial, viral, fungal, protozoal, and parasitic infections	
3. Describe the mechanisms of action of antimicrobial classes	
4. Recognize basic terminology describing the principles of pharmacology (e.g., pharmacokinetics, pharmacodynamics)	
5. Describe the mechanisms of action of sedatives, anesthetics, and analgesics	

J. Epidemiology	2.5%
1. Apply terminology relating to epidemiology to the interpretation of diagnostic test results (e.g., sensitivity, specificity, predictive values)	
2. Recognize advantages, and disadvantages of various study designs	
3. Recognize advantages and disadvantages of basic statistical analyses (i.e., Chi-square, T tests, types of errors/bias, correlation, ANOVA)	
II. SAIM Specific Section	**50%**
A. Cardiology	**6%**
1. Recognize the clinical features and differential diagnoses of acquired heart disease	
2. Recognize the clinical features and predisposing factors for systemic hypertension	
3. Recognize the clinical features and differential diagnoses of congenital heart disease	
4. Recognize the clinical features and differential diagnoses for pericardial disease	
5. Recognize the clinical features, differential diagnoses, and principles of management for pulmonary hypertension	
6. Recognize the clinical features, predisposing factors, and principles of management of thromboembolic disease	
7. Select indicated therapy for arrhythmias (e.g., ventricular tachycardia, supraventricular tachycardia, AV block, atrial fibrillation)	
8. Recognize the classes of drugs used in the management of cardiac disease	
9. Recognize the clinical features and pathophysiology of cardiovascular syncope	
10. Recognize the clinical features and diagnostics for heartworm disease	
11. Recognize common cardiac neoplasms	
B. Endocrine	**6.5%**
1. Recognize the clinical features and diagnostics for feline hyperthyroidism	
2. Recognize the clinical features and diagnostics for canine hypothyroidism	
3. Recognize the clinical features, diagnostics, and emergency treatment for hypoadrenocorticism	
4. Recognize the clinical features and diagnostics for hyperadrenocorticism	
5. Recognize the classes of drugs used in the management of endocrine diseases	
6. Recognize endocrine neoplastic disorders	
7. Recognize the clinical features, predisposing factors, diagnostics, and emergency management for diabetes mellitus	
8. Interpret the results of a hypercalcemia panel (i.e., ionized calcium, PTH, PTHrp, Vitamin D)	
9. Recognize clinical features, differential diagnoses, and acute management principles of hypocalcemia	
10. Recognize clinical features, differential diagnoses, and acute management principles of hypercalcemia	

C. Gastrointestinal/Hepatobiliary	6.5%
1. Interpret the results of liver function tests (e.g., fasting and post-prandial bile acids, ammonia, protein C)	
2. Differentiate between hepatocellular leakage and cholestatic enzymes	
3. Recognize the clinical features and principles of management of enteropathies	
4. Recognize infectious causes of gastrointestinal disease (e.g., mycotic, protozoal, parasitic, and viral)	
5. Recognize the clinical features and principles of management of portosystemic vascular anomalies	
6. Recognize the clinical features, differential diagnoses, and principles of management of hepatobiliary disorders	
7. Recognize the clinical features, differential diagnoses, and principles of management of pancreatitis	
8. Recognize the clinical features and diagnostics of exocrine pancreatic disease	
9. Differentiate causes of dysphagia	
10. Recognize the clinical features, differential diagnoses, and principles of management of esophageal disorders	
11. Recognize clinical features and principles of management of oral, gastrointestinal, and hepatobiliary neoplastic disorders	
D. Hemolymphatic/Immunology	**6%**
1. Identify clinical characteristics, differential diagnoses, diagnostics, and principles of management of anemia	
2. Identify clinical characteristics, differential diagnoses, diagnostics, and principles of management of thrombocytopenia	
3. Identify clinical characteristics, differential diagnoses, diagnostics, and principles of management of neutropenia	
4. Recognize the clinical features, differential diagnoses, and diagnostics of hematologic malignancies, as well as principles of management of lymphoma	
5. Apply fundamentals of screening diagnostics prior to blood product administration	
6. Recognize the principles of blood product selection	
7. Select appropriate diagnostic testing for primary and secondary hemostasis	
8. Recognize the mechanisms of erythrocytosis	
9. Recognize the clinical applications and side effects of immunomodulatory medications	
10. Recognize the principles of management of bone marrow and gastrointestinal side effects of chemotherapy	
11. Interpret a peripheral blood smear	
12. Identify the cytologic characteristics of malignancy including common tumor types	
13. Formulate a differential diagnosis list for peripheral lymphadenopathy in dogs	
E. Nephrology/Urology	**6.5%**
1. Formulate a differential diagnosis list for PU/PD	
2. Interpret diagnostic tests to assess kidney function (e.g., biochemical profile, urinalysis, SDMA)	

3. Recognize the principles of diagnosis and management of proteinuria	
4. Formulate a differential diagnoses list and treatment plan for acute kidney injury	
5. Apply the IRIS staging system to patients with chronic kidney disease	
6. Identify predisposing factors for cystoliths (i.e., calcium oxalate, struvite, urate)	
7. Recognize the diagnostic tests available for urogenital neoplastic disorders	
8. Identify clinical features and differential diagnoses for lower urinary tract disease	
9. Differentiate pollakiuria and polyuria	
10. Identify indications of drugs used in the management of urologic diseases	
11. Recognize the principles of management of chronic kidney disease	
F. Neurology/Musculoskeletal	**5.5%**
1. Recognize differential diagnoses for encephalopathies (e.g., inflammatory, metabolic, neoplastic, and vascular)	
2. Recognize differential diagnoses for myelopathies (e.g., degenerative, inflammatory, neoplasia, vascular)	
3. Recognize differential diagnoses, clinical features, and diagnostic evaluation of arthropathies	
4. Recognize differential diagnoses, clinical features, and diagnostic evaluation of myopathies	
5. Identify prognostic indicators for neurologic recovery from acute spinal cord injury	
6. Identify indications and adverse effects of anticonvulsant drugs used in the management of seizures	
7. Select drugs for use in treatment of central nervous system disease (e.g., antimicrobials and chemotherapeutics that can penetrate the blood-brain barrier)	
8. Identify the differentials for acute lower motor neuron signs	
9. Utilize the neurologic exam to differentiate between neurologic and non-neurologic causes for weakness	
10. Differentiate the clinical features of neurologic and non-neurologic causes for episodes (e.g., seizures vs. syncope)	
11. Describe the pathway and diagnostic approach to Horner syndrome	
12. Recognize emergent treatments for a patient with signs of increased intracranial pressure	
G. Nutrition/Metabolism	**4%**
1. Recognize findings of diet induced disorders (e.g., deficiencies, excesses, toxicity, contamination)	
2. Recognize nutrients of concern based on pathophysiologic state including when a nutritional consultation is needed	
3. Integrate nutritional assessment results into overall assessment (e.g., muscle condition score, body condition score) and treatment plan (e.g., routes and types of nutritional support)	
4. Recognize unique nutritional differences in cats (e.g., taurine, arachidonic acid, niacin)	
5. Recognize the clinical features of disorders of lipid metabolism	
6. Recognize clinical features of cachexia and sarcopenia	
7. Recognize the methods to determine nutritional adequacy for pet diets and supplements	
8. Describe pharmacology of therapeutics used in appetite stimulation	

H. Respiratory	**5.5%**
1. Differentiate between pulmonary and cardiovascular causes of dyspnea	
2. Recognize the clinical features, differential diagnoses, and diagnostics of nasal disease and epistaxis	
3. Recognize the clinical features, differential diagnoses, diagnostics, and principles of management of laryngeal disease	
4. Recognize the clinical features, differential diagnoses, diagnostics, and principles of management of tracheal disease	
5. Recognize the clinical features, differential diagnoses, diagnostics, and principles of management of pulmonary disease	
6. Recognize the clinical features, differential diagnoses, diagnostics, and principles of management of pleural and mediastinal disease	
7. Differentiate between clinical features of primary pulmonary and metastatic neoplasia	
I. Pan-Systemic	**3.5%**
1. Identify paraneoplastic syndromes	
2. Describe principles of antimicrobial stewardship	
3. Recognize ocular manifestations of systemic diseases	
4. Recognize dermatologic manifestations of systemic diseases	
5. Recognize zoonotic and nosocomial disease and their modes of transmission	