American College of Veterinary Internal Medicine (ACVIM)
Neurology Specialty Exam (NEURO)
Test Specifications

I. General Knowledge	**20%**
A. Anatomy & Physiology	
1. Identify the gross anatomy and neuroanatomic structures of the cat, dog, horse, and food/fiber animal brain and spinal cord	
2. Recognize the basic microscopic anatomy of the nervous system (e.g., astrocyte, neuron, Purkinje cell)	
3. Describe the functional neuroanatomy of the central, peripheral, and autonomic nervous systems	
4. Describe the basic principles of neurophysiology in regard to neurotransmission	
5. Describe the basic principles of cerebrospinal fluid (CSF) dynamics (e.g., production, flow, absorption)	
6. Describe the physiological maintenance of intracranial pressure	
7. Recognize the differences in vascular anatomy between species	
8. Outline the principles of nociceptive pathways	
B. Pharmacology & Toxicology	
1. Explain the effects of pharmaceuticals and neurotoxins on central, peripheral, and autonomic nervous system receptors and neurotransmitters	
2. Describe the mechanisms of drug-delivery through the blood-brain barrier	
3. Explain mechanisms of drug resistance (e.g., anti-seizure, anti-microbial)	
4. Describe the mechanism of action of the major classes of anti-seizure drugs	
5. Recognize the basic principles of anti-seizure drug absorption, metabolism, and clearance (e.g., efficacy, half-lives, MOA, pharmacodynamic, pharmacokinetics, safety, side effects)	
6. Differentiate the classes and mechanisms of action of analgesic and anesthetic therapy	
7. Recognize the basic principles of neurologic drug absorption, metabolism, and clearance (e.g., efficacy, half-lives, MOA, pharmacodynamic, pharmacokinetics, safety, side effects)	
8. Describe the mechanisms of action and side-effects of immunomodulatory and chemotherapeutic drugs for neurologic diseases (e.g., inflammatory, neoplasia, neuromuscular)	
II. Medical Neurology	**31%**

A. Technical Skills & Diagnostic Interpretation
1. Interpret neurologic findings from an examination of a cat, dog, horse, and food/fiber animal
2. Provide a neuroanatomic localization based on examination with or without historical findings
3. Interpret hematological, serum chemistry, and urinalysis results as they relate to neurologic disorders
4. Interpret organ function tests (e.g., endocrine, liver) as they relate to neurologic disorders
5. Interpret radiographs of the thorax and abdomen as they relate to neurologic disorders
6. Describe the anatomy and technique for cisterna magna collection of CSF in a cat, dog, horse, and food/fiber animal
7. Describe the anatomy and technique for lumbar collection of CSF in a cat, dog, horse, and food/fiber animal
8. Describe the technique for a cervical and lumbosacral epidural and perineural injections
9. Recognize indications for, and the physiological basis of, electrodiagnostic testing (e.g., sensory, motor, evoked potentials)
10. Describe how to set-up for EMG, nerve conduction testing, BAER, and EEG
11. Interpret testing results from EMG, nerve conduction testing, BAER, and EEG
12. Recognize indications for Myringotomy
13. Differentiate infectious disease testing techniques (e.g., PCR, serology, western blot)
14. Interpret infectious disease testing results
15. Recognize common genetic mutations that cause neurologic and muscular diseases
B. Canine & Feline Disease Pathogenesis, Diagnosis & Treatment (e.g., analgesia, hyper-osmotic agents/fluid therapy)
1. Describe the pathogenesis, diagnostics, and treatment of:
a. vascular disease affecting the nervous system
b. inflammatory disease of the CNS (e.g., infectious vs non-infectious)
c. inflammatory disease of the PNS, including neuromuscular system (e.g., infectious vs non-infectious)
d. traumatic disease of the CNS
e. traumatic disease of the PNS (including neuromuscular system)
f. neoplastic diseases affecting the CNS
g. neoplastic diseases affecting the PNS, including neuromuscular system (e.g., paraneoplastic)
h. toxic diseases affecting the nervous system
i. anomalous and/or congenital diseases affecting the nervous system

j. metabolic diseases affecting the nervous system (e.g., endocrinopathies, liver disease)
k. nutritional diseases affecting the nervous system
l. degenerative diseases affecting the nervous system (e.g., juvenile, geriatric)
m. movement disorders (e.g., episodic ataxias, paroxysms, tremor syndromes)
n. epilepsy (e.g., genetic, reactive, structural, unknown)
o. micturition dysfunction (e.g., UMN/LMN bladder)
p. disc disease
q. sleep disorders
r. Myringotomy
2. Describe diagnosis and treatment of idiopathic nervous system diseases (e.g., facial nerve paralysis, trigeminal neuritis)
3. Recognize basic principles of radiation therapy as it applies to neurologic disorders:
a. indications
b. complications
c. modalities (e.g., fractionated, stereotactic)
C. Complimentary Therapies
1. Recognize the indications for complimentary therapies (e.g., acupuncture, rehabilitation, regenerative medicine)
III. Surgical Neurology **22%**
A. General
1. Apply tissue handling theory and techniques (e.g., bone and wound healing, hemostasis, skin-handling, tension lines)
2. Apply principles of fixation and biomechanics to neurosurgical cases
3. Select appropriate neurosurgical instrumentation
B. Surgical Procedures
1. Identify the indications, describe the procedures and post-operative care, and recognize the complications for the following surgical procedures:
a. Ventral slot
b. Cervical hemilaminectomy
c. Thoracolumbar hemilaminectomy
d. Durotomy

e. Corpectomy
f. Dorsal laminectomy of cervical and thoracolumbar vertebral column
g. Lumbosacral decompression
h. Disc fenestration
i. Vertebral column stabilization (e.g., cervical, lumbar/LS, thoracic)
j. Nerve and muscle biopsy
k. Ventriculoperitoneal shunt
l. Craniectomy (e.g., rostro-tentorial, suboccipital, transfrontal)
m. Atlantoaxial (AA) luxation
n. Tumor excision (e.g., brain, spinal cord)
2. Recognize the indications for the following surgical procedures:
a. Hypophysectomy
b. Foraminotomy
c. Corpectomy
d. Brain biopsy (i.e., stereotactic)
e. Cervical vertebral distraction-fusion (e.g., disc replacement)

IV. Neuroradiology	**22%**
A. Radiographs	
1. Interpret radiographs of the axial and appendicular skeleton	
2. Interpret radiographs of the skull	
B. Myelogram (Radiograph & CT)	
1. Describe indications and techniques for performing a myelogram	
2. Interpret myelograms of the vertebral column (including artifacts of myelograms)	
C. Computerized Tomography (CT)	
1. Describe indications for performing a CT	
2. Describe the fundamentals of CT imaging (e.g., Hounsfield units, window width and level)	
3. Describe CT scanning protocols (e.g., contrast media, imaging planes, slice thickness)	
4. Interpret CT images of the head	
5. Interpret CT images of the vertebral column and spinal cord	

6. Identify common artifacts of CT and describe how to correct them
D. Magnetic Resonance Imaging (MRI)
1. Describe indications for performing an MRI
2. Describe the fundamentals of MRI (e.g., basic physics / image acquisition, contrast media, IR, TE, TR)
3. Identify common MRI sequences and their indications (e.g., ADC, DWI, FLAIR, STIR, T1, T2, T2*)
4. Interpret MRI images of the head
5. Interpret MRI images of the vertebral column
6. Interpret MRI images of the peripheral nervous system and musculature
7. Identify common artifacts of MRI & describe how to correct them

V. Neuropathology	**5%**
1. Explain CSF sample storage and preparation	
2. Interpret CSF cytology on photomicrograph	
3. Clinically interpret CSF analysis (e.g., cell count, CK, glucose, protein)	
4. Describe collection and storage of a biopsy sample from a CNS, PNS, and muscle sample	
5. Identify and provide differentials for various diseases in the CNS, on a gross and microscopic level (e.g., vascular, neoplasia, inflammatory, metabolic)	
6. Identify and provide differentials for various diseases in the PNS, including the neuromuscular system, on a gross and microscopic level (e.g., neoplasia, inflammatory, trauma)	
7. Evaluate a clinical and anatomical pathological report and provide differentials	