

# North American Neuroscience Course (Brain Camp) Week 2 AGENDA On Demand 2022

| Advanced Veterinary Neuroscience – Week 2  |                   |
|--|-------------------|
| Торіс  | Presenter(s)      |
| Neuropathology – Histologic Pattern Recognition and Select Malformations   |                   |
| <ul> <li>Recognize the basic histologic landscape of the CNS and PNS</li> </ul>  | Dr. Drew          |
| <ul> <li>Describe how the CNS and PNS response to disease</li> </ul>   | Miller            |
| <ul> <li>Define the common malformations and how to recognize them</li> </ul>  |                   |
| Infectious Diseases of the CNS   |                   |
| <ul> <li>Recognize infectious conditions that can affect the CNS in domestic animals (including large animals)</li> </ul>                  |                   |
| <ul> <li>List pathways of spread for disease processes in the CNS and most common agents<br/>associated with different pathways</li> </ul> | Dr. Alina Demeter |
| <ul> <li>List specific etiologies for inflammatory conditions of the CNS in various domestic species</li> </ul>                            |                   |
| Formulate differential diagnoses based on specific inflammatory patterns/processes   |                   |
| Non-Infectious Inflammatory Diseases of the CNS  |                   |
| Differentiate between granulomatous meningoencephalitis (GME), necrotizing   |                   |
| meningoencephalitis (NME), and necrotizing leukoencephalitis (NLE) in dogs   |                   |
| <ul> <li>List nutritional and toxic causes of inflammation in different domestic animals</li> </ul>  | Dr. Alina Demeter |
| List the most common circulatory conditions affecting the CNS in different domestic  |                   |
| species  |                   |
| Be familiar with the neuropathologic features of intervertebral disc disease   |                   |
| Degenerative Diseases of the CNS   |                   |
| <ul> <li>Be familiar with lysosomal diseases of the CNS in domestic animals</li> </ul>   |                   |
| List various multisystem neuronal degenerations in domestic animals and specific   | Dr. Alina Demeter |
| affected breeds  |                   |
| Formulate differential diagnoses based on signalment and main histopathology findings  |                   |
| CNS Neoplasia  |                   |
| <ul> <li>Name common and rare extra-axial and intra-axial brain tumors in dogs and cats</li> </ul>   | Dr. Tim Pontloy   |
| Understand the significance and limitations of the human and veterinary grading  | ы. ПП вениеу      |
| systems for brain tumors, and the significance of molecular classification of gliomas  |                   |

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| Give differential diagnoses for each of the 3 locations of spinal cord tumors (extradural, intradural-extramedullary, intramedullary)  |                   |
|--|-------------------|
| MRI of CNS Neoplasia   |                   |
| <ul> <li>Characterize brain tumors on MRI as 1) meningeal masses, 2) ventricular masses, 3)<br/>enhancing intra-axial lesions, 4) non-enhancing intra-axial lesions, and 5) multifocal<br/>lesions</li> </ul>                          | Dr. Tim Bentley   |
| <ul> <li>Provide the neoplastic differential diagnosis for each of these 5 locations / patterns,<br/>including common tumors and rare tumors</li> </ul>  |                   |
| <ul> <li>Provide the major non-neoplastic differential diagnosis for each of these 5 locations /<br/>patterns</li> </ul>   |                   |
| MRI Distinction of Neoplasia vs. Non-Neoplasia   |                   |
| Recognize which extra-axial and intra-axial brain masses could be granulomas rather than neoplastic lesions  |                   |
| <ul> <li>List the infectious and non-infectious diseases that can lead to a granuloma "mimicking"<br/>a brain tumor on MRI</li> </ul>  | Dr. Tim Bentley   |
| <ul> <li>Recognize lesions that span the pia mater on MRI, occupying a mixed intra-axial and<br/>extra-axial location</li> </ul>   |                   |
| <ul> <li>Use MRI features such as a mixed intra-axial / extra-axial location, the border of the<br/>lesion and the degree of perilesional edema to predict whether neoplastic or<br/>granulomatous diseases are most likely</li> </ul> |                   |
| Neuropathology – CNS/PNS Neoplasia   |                   |
| <ul> <li>Provide a list of differentials for tumors occurring extradural, intradural-extramedullary,<br/>and intradural-intramedullary</li> <li>Recognize the common pathologic features of each tumor</li> </ul>                      | Dr. Drew Miller   |
| Prioritize tumor differentials based on signalment, tumor location, and presentation   |                   |
| Pathophysiology of Seizures and Epilepsy   |                   |
| Comprehend in detail the underlying pathophysiology of recurrent seizure generation in companion animals   | Dr. Ned Patterson |
| Describe the mechanism of action of the anti-seizure drugs used in companion animals   |                   |
| <ul> <li>Principles and Practice Treatment of Epilepsy</li> <li>Make evidence-based decision on the treatment of seizures in companion animals</li> </ul>  | Dr. Ned Patterson |



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| <ul> <li>Educate other veterinarians, students, and clients about the standard of care for chron<br/>seizures in companion animal</li> </ul> | lic                  |
|--|----------------------|
| Canine Electroencephalography Insights from Intracranial EEG Research  |                      |
| • Describe EEG findings from research in dogs, that are relevant to the general canine   |                      |
| epilepsy population  | Du Mari Dattana an   |
| Be aware of considerations for the one device currently available for the treatment of   | Dr. Ned Patterson    |
| canine epilepsy, and the potential for future devices with clinical application for  |                      |
| companion animals  |                      |
| Refractory Epilepsy & Status Epilepticus   |                      |
| <ul> <li>Make evidence-based decision on the treatment of refractor seizures and seizure</li> </ul>  |                      |
| emergencies  | Dr. Ned Patterson    |
| Educate veterinarians, students, and clients about the standard of care for seizures in  |                      |
| companion animals  |                      |
| Advanced Imaging of the Equine Head  |                      |
| <ul> <li>Discuss the pros and cons of different modalities available for evaluation of the equine</li> </ul>                                 | )                    |
| head   | Dr. Frin Porter      |
| <ul> <li>Be familiar with common anatomical differences between equine and canine heads as</li> </ul>  |                      |
| evaluated with CT and MRI  |                      |
| Review common pathology of the equine head as seen with CT and MRI   |                      |
| Principles of Radiation Neurobiology   |                      |
| <ul> <li>Explain the biology and the clinical principles behind radiation therapy</li> </ul>   | Dr. Marilia Takada   |
| Describe the different methods of delivery of RT for tumors of CNS   |                      |
| Radiotherapy of CNS Neoplasms  |                      |
| <ul> <li>Explain how radiation therapy is incorporated into the care of tumors of CNS</li> </ul>   | Dr. Marilia Takada   |
| Describe the outcomes of intracranial tumors treated with RT   |                      |
| Spinal Neoplasia   |                      |
| Form appropriate differentials for masses within and surrounding the spinal canal  |                      |
| <ul> <li>Know the common extradural, intradural/ extramedullary and intramedullary tumors of</li> </ul>                                      | Dr. Michaela Reaslev |
| dogs and cats  |                      |
| Correctly identify spinal neoplasia surgical candidates and the best surgical approach   |                      |
| based on the tumor location  |                      |

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| Micturition Disorders   |                      |
|---|----------------------|
| Know the sympathetic, parasympathetic and somatic innervation to the bladder and                          |                      |
| urethra   | Dr. Michaele Pecelov |
| <ul> <li>Understand common bladder drug mechanisms of actions</li> </ul>                                  | DI. MICHAEIA DEASIEY |
| <ul> <li>Correctly interpret urine cultures results and select appropriate antibiotics for the</li> </ul> |                      |
| bacteria present  |                      |
| Neuro-Ophthalmology   |                      |
| <ul> <li>Trace the pathway of a photon of light to the visual cortex in the brain</li> </ul>              |                      |
| Identify the 12 cranial nerves by both name and number and give the functions of those                    |                      |
| cranial nerves that are involved with the eye and orbit   | Dr. Palnh Hamor      |
| <ul> <li>Describe the anatomic route of the normal pupillary light reflex (PLR) and given a</li> </ul>    | DI. Ναιρη Παιτιοι    |
| description of an abnormal PLR, be able to localize the possible lesion(s)                                |                      |
| <ul> <li>Outline the anatomic route of the visual pathway and given a description of a visual</li> </ul>  |                      |
| deficit, be able to localize the possible lesion(s)   |                      |
| Applications of 3D Printing in Veterinary Neurology   |                      |
| <ul> <li>Develop an understanding of printer technology and available materials</li> </ul>                |                      |
| <ul> <li>Recognize how to acquire ideal images for printing and basic techniques on model</li> </ul>      | Dr. Fred Wininger    |
| creation  |                      |
| <ul> <li>Appreciate the different applications beyond anatomic modeling including custom</li> </ul>       |                      |
| surgical tool creation  |                      |
| Neuro-Anesthesia  |                      |
| <ul> <li>Discuss the pathophysiology of cerebral blood flow and intracranial pressure</li> </ul>          |                      |
| Present the effect of anesthetic and preanesthetic agents on cerebral blood flow and                      |                      |
| intracranial pressure   | Dr. Chito Pablo      |
| Explain the different ways to decrease intracranial pressure during the peri-anesthetic                   |                      |
| period  |                      |
| Discuss the anesthetic considerations for intervertebral disc disease and spinal injuries                 |                      |
| Pathophysiology of Acute Spinal Cord Injury   |                      |
| <ul> <li>List the main mechanisms of primary injury in a patient with SCI</li> </ul>                      | Dr. Sarah Moore      |
| <ul> <li>List the main mechanisms of secondary injury in a patient with SCI</li> </ul>                    |                      |

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| <ul> <li>Consider practical clinical approaches that might allow for intervention associated with<br/>both primary and secondary injury</li> </ul>                                     |                 |
|--|-----------------|
| Treatment of Spinal Cord Injury  |                 |
| • Define proposed mechanisms of action for various therapeutic strategies (DMSO, MMP-<br>inhibitors, high dose corticosteroids, etc.) to improve outcome after SCI                     |                 |
| <ul> <li>Identify challenges with interpretation of the NASCIS studies in the context of both<br/>human and canine spinal cord injury</li> </ul>                                       | Dr. Sarah Moore |
| • Discuss aspects of the basic and clinical SCI literature relevant to treatment in the veterinary clinical setting (e.g. role of rehabilitation therapy)                              |                 |
| Critical Points in the Diagnosis and Treatment of IVDD   |                 |
| <ul> <li>Compare and contrast diagnostic accuracy for CT and MRI in the diagnosis of acute<br/>canine IVDE</li> </ul>  | Dr. Sarah Moore |
| <ul> <li>Discuss the relevance of emergent surgical decompression for dogs with IVDE</li> <li>Evaluate the veterinary literature surrounding diagnosis and treatment of PMM</li> </ul> |                 |
| Pathogenesis and Diagnosis of Cervical Spondylomyelopathy  |                 |
| <ul> <li>Explain the pathogenesis of cervical spondylomyelopathy (CSM) (disc and osseous-<br/>associated)</li> </ul>   |                 |
| <ul> <li>Identify the abnormalities associated with CSM on various diagnostic imaging techniques</li> </ul>  | Dr. Kari Foss   |
| <ul> <li>Outline the literature describing the options for medical and surgical management of CSM</li> </ul>   |                 |
| Pathogenesis and Diagnosis of Cervical Spondylomyelopathy  |                 |
| <ul> <li>Explain the pathogenesis of cervical spondylomyelopathy (CSM) (disc and osseous-<br/>associated)</li> </ul>   |                 |
| <ul> <li>Identify the abnormalities associated with CSM on various diagnostic imaging techniques</li> </ul>  | Dr. Kari Foss   |
| <ul> <li>Outline the literature describing the options for medical and surgical management of CSM</li> </ul>   |                 |
| Lumbosacral Diseases   | Dr. Kari Foss   |
| Explain the pathogenesis of lumbosacral diseases   | ום. המווז וט.   |



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| <ul> <li>Identify the clinical signs and abnormalities associated with lumbosacral diseases on<br/>various diagnostic imaging techniques</li> </ul> |                     |
|---|---------------------|
| Various diagnostic imaging techniques   |                     |
| Outline the literature describing the options for medical and surgical management of  |                     |
| Iumbosacrai diseases  |                     |
|   |                     |
| <ul> <li>Explain the different terminology used to describe pain which includes nociceptive,</li> </ul>   |                     |
| acute, chronic, adaptive, maladaptive, neuropathic and functional pain  | Dr. Sheilah         |
| <ul> <li>Describe the etiology of different types of pain and that many patients have a</li> </ul>  | Robertson           |
| combination of these  |                     |
| Explain the etiology and recognize clinical signs suggestive of neuropathic pain  |                     |
| Physical Therapy and Rehabilitation in Neurology  |                     |
| <ul> <li>Recognize types of neurological patients that can benefit from rehabilitation and</li> </ul>   |                     |
| integrative medicine  | Dr. Jen Repac       |
| <ul> <li>Incorporate methods and goals of neurological rehab and integrative therapy</li> </ul>   |                     |
| <ul> <li>Utilize current literature for neurological rehabilitative and integrative therapy</li> </ul>  |                     |
| Media Otitis: A Dermatologist Perspective   |                     |
| Describe the basic anatomy of middle ear and the common pathophysiology of canine   |                     |
| otitis media  | Dr. Dawrad a raa    |
| <ul> <li>Recognize which breeds of dogs are more prone to otitis media and why</li> </ul>   | Dr. Dawn Logas      |
| Diagnosis otitis media.   |                     |
| Treat otitis media  |                     |
| Management of the Acute Upper Airway Crisis   |                     |
| Identify brachycephalic canine and feline patients  |                     |
| <ul> <li>Understand the utility of a pre-anesthetic plan for brachycephalic patients</li> </ul>   | Dr. Chrissie Rutter |
| <ul> <li>Implement positioning, nebulization, and pharmacologic techniques to assist breathing</li> </ul>   |                     |
| in the brachycephalic upper airway crisis   |                     |
| Craniocervical Junction Abnormalities – "Chiari-like" Malformation, Syringomyelia, Atlantoaxial   |                     |
| Instability   |                     |
| Describe the anatomy and development of the craniocervical junction   | Dr. Gabriel Garcia  |
| Recognize pathology of the craniocervical junction and associated clinical signs  |                     |
| Recognize secondary changes due to nathology of the craniocervical junction   |                     |
|   |                     |

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### North American Neuroscience Course (Brain Camp) Week 2 AGENDA On Demand 2022

| Craniocervical Junction Management & Surgery   |                     |
|--|---------------------|
| <ul> <li>Identify pathology of the craniocervical junction</li> </ul>                                |                     |
| Describe the pros and cons of surgical procedures, as well as potential complications                | Dr. Gabriel Garcia  |
| Recognize whether patients are candidates for medical management or surgical                         |                     |
| intervention   |                     |
| Congenital Spinal Malformations  |                     |
| <ul> <li>Explain the most common thoracic vertebral malformations and the specific breeds</li> </ul> |                     |
| affected   | Dr. Shaila Carrara  |
| <ul> <li>Determine if a malformation is like to be clinically significant</li> </ul>                 | Dr. Snella Carrera- |
| <ul> <li>List benefits and limitations of medical management and surgical intervention</li> </ul>    | JUSIIZ              |
| <ul> <li>Describe elements of pathology contributing to clinical signs</li> </ul>                    |                     |
| <ul> <li>Explain potential surgical techniques for management of the condition</li> </ul>            |                     |
| Vertebral Fractures and Luxations  |                     |
| Recognize the indications for spinal fixation  | Dr. Amy Equbor      |
| Be familiar with different methods of spinal fixation  | Dr. Amy Fauber      |
| <ul> <li>Describe the healing process of the vertebral column</li> </ul>                             |                     |
| Complications in Spinal Surgery  |                     |
| <ul> <li>Describe principles of spinal fixation as they relate to spinal instability</li> </ul>      | Dr. Pob Poramon     |
| <ul> <li>Apply methods to correct adverse event related to spinal surgery</li> </ul>                 | DI. DUD Delgillall  |
| <ul> <li>Recognize when additional imaging may be beneficial</li> </ul>                              |                     |

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