

Large Animal Candidate Boot Camp
October 10-13, 2024
The Ohio State University | Columbus, OH

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DAY 1 Thursday, October 10		
Time (Eastern Time)	Topic	Presenter(s)
7:30 am	Shuttle to the OSU Galbreath Equine Center	
7:45-8:00 am	Registration	
8:00-8:10 am	Welcome & Introductions	<i>Burns</i>
8:10-8:50 am	Thoracic and Abdominal Ultrasonography <ul style="list-style-type: none"> Describe the basic principles of ultrasonography and understand how the fundamentals of acoustics and physics of ultrasound impact image formation Understand basic ultrasound instrumentation available for large animals Identify normal ultrasonographic anatomy of the abdomen and thorax of ruminants and horses Interpret select ultrasonographic abnormalities in horses and ruminants 	<i>Hostnik</i>
8:50-9:30 am	Equine Ophthalmic Examination <ul style="list-style-type: none"> Describe how to perform the nerve block that facilitates examination Describe the procedures involved in a complete ophthalmic examination in a horse Recognize and describe the normal appearance of the anterior and posterior segment of a horse Installation and Maintenance of a Subpalpebral Lavage System <ul style="list-style-type: none"> Describe the nerve blocks that facilitate placement of a subpalpebral lavage system Describe the appropriate landmarks for safe placement of a subpalpebral lavage system Describe a protocol for daily maintenance and use of a subpalpebral lavage system 	<i>Metzler</i>
9:30-9:50 am	Break	

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9:50-10:40 am	<p>Echocardiography</p> <ul style="list-style-type: none"> • Understand principles of echocardiography, including appropriate equipment, settings and common imaging artifacts • Obtain and interpret standard 2-dimensional, M-mode, color and spectral Doppler echocardiography from standard right and left sided windows • Identify common acquired and congenital cardiac lesions of large animals 	<i>Rhinehart</i>
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DAY 1 Thursday, October 10		
Time (Eastern Time)	Topic	Presenter(s)
10:40-11:30 am	Diseases of the Foot/Podiatric Exam and Therapeutic Techniques <ul style="list-style-type: none"> • Evaluation of equine, ruminant foot • Principles of trimming for equine, ruminant foot • Digital venography • Therapeutic block application • Foot cast application 	Lesser
11:30-12:20 pm	Neurologic Examination <ul style="list-style-type: none"> • Understand the steps involved in an equine neurologic evaluation • Describe neurologic exam findings and abnormalities using appropriate terminology • Localize neurologic lesions based on the clinical presentation • Describe the equine neurologic grading system 	Hostnik
12:20 – 1:00 pm	Lunch	

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DAY 1 (continued) Thursday, October 10		
Time (Eastern Time)	Topic	Presenter(s)
1:00-3:00 pm	<p>Labs – 60 minutes each rotation</p> <p>Lab 1: Ultrasonography</p> <ul style="list-style-type: none"> • Perform an advanced ultrasonographic examination of the equine thorax and abdomen • Identify thoracic (lung, diaphragm) and abdominal (stomach, small and large intestine, liver, spleen, and kidneys) structures <p>Lab 2: Echocardiography</p> <ul style="list-style-type: none"> • Obtain standard echocardiographic images of adult horse • Identify relevant echocardiographic anatomy <p>Lab 3: Ophthalmic Exam</p> <ul style="list-style-type: none"> • Perform local and regional anesthetic techniques • Perform an advanced ophthalmic examination • Place a subpalpebral lavage system <p>Lab 4: Podiatry</p> <ul style="list-style-type: none"> • Principles of balanced trim • Digital venography • Foot cast application 	<p><i>Metzler, Hostnik Rhinehart, Lesser, Burns</i></p>
3:00-3:30 pm	Break	

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DAY 1 (continued) Thursday, October 10		
Time (Eastern Time)	Topic	Presenter(s)
3:30-5:30 pm	Labs – 60 minutes each rotation Lab 1: Ultrasonography <ul style="list-style-type: none"> Perform an advanced ultrasonographic examination of the equine thorax and abdomen Identify thoracic (lung, diaphragm) and abdominal (stomach, small and large intestine, liver, spleen, and kidneys) structures Lab 2: Echocardiography <ul style="list-style-type: none"> Obtain standard echocardiographic images of adult horse Identify relevant echocardiographic anatomy Lab 3: Ophthalmic Exam <ul style="list-style-type: none"> Perform local and regional anesthetic techniques Perform an advanced ophthalmic examination Place a subpalpebral lavage system Lab 4: Podiatry <ul style="list-style-type: none"> Principles of balanced trim Digital venography Foot cast application 	<i>Metzler, Hostnik Rhinehart, Lesser, Burns</i>
5:30-5:45 pm	Break	
5:45-6:30 pm	Tour of OSU VMC	<i>Burns</i>
6:30-8:30 pm	Dinner – Career Paths in Large Animal Internal Medicine	<i>All</i>
8:30 pm	Shuttle to Hotel	

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DAY 2 Friday, October 11		
Time (Eastern Time)	Topic	Presenter(s)
7:45 am	Shuttle to OSU Galbreath Equine Center	
8:00-8:40 am	Liver – Evaluation and Biopsy <ul style="list-style-type: none"> Identify the indications for performing a liver biopsy in the horse Identify possible complications and risk factors associated with liver biopsy in the horse Understand the technique for performing a standing, percutaneous, ultrasound guided liver biopsy in the horse Understand basic liver histopathology 	<i>Timko</i>
8:40-9:20 am	Bone Marrow Evaluation – Indication, Technique, and Interpretation <ul style="list-style-type: none"> List indications for a bone marrow aspirate or biopsy and the importance of having a history and current CBC List preferred sites of collection and describe how bone marrow is collected, including precautions, sterility measures, and potential complications Describe how aspirate and biopsy specimens are prepared and stained, including routine and special stains and why prompt processing is recommended Describe how bone marrow aspirates and biopsies are evaluated, including cellularity, M:E ratio, megakaryocytes, lineage maturation, and lymphoid cells Describe the features of bone marrow in health and with hypo- and hyperplasia, inflammation, neoplasia, and fibrosis 	<i>Wellman</i>
9:20-10:00 am	CSF Collection Techniques <ul style="list-style-type: none"> Describe the C1/C2, LS, and AO CSF collection procedures and appropriate sedation protocol List the advantages, disadvantages, and complications associated with each CSF collection procedure 	<i>Burns</i>

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DAY 2 (continued) Friday, October 11		
Time (Eastern Time)	Topic	Presenter(s)
10:00-10:20 am	Break	
10:20 am - 12:20 pm	<p>Labs – 60 minutes each rotation</p> <p>Lab 5: Liver Biopsy</p> <ul style="list-style-type: none"> Identify landmarks for ultrasonographic imaging of the liver on the left and right sides of the abdomen Perform a needle biopsy of the liver on the left and right sides of the abdomen in a standing, sedated horse <p>Lab 6: LS CSF Collection</p> <ul style="list-style-type: none"> List the materials needed for LS CSF collection in the horse. Identify the anatomical landmarks for performing a LS CSF collection Perform LS CSF collection on a standing, sedated horse <p>Lab 7 Bone Marrow Aspiration, Biopsy</p> <ul style="list-style-type: none"> Collect sternal bone marrow aspirate, biopsy Evaluate sample quality after collection Process bone marrow samples for cytology, histopathology <p>Lab 8: C1/C2 CSF Collection</p> <ul style="list-style-type: none"> List the materials needed for C1/C2 CSF collection in the horse Identify the anatomical landmarks for performing a C1/C2 CSF collection Using ultrasonography, identify the site for performing a C1/C2 CSF collection Perform C1/C2 CSF collection on a standing, sedated horse 	<p><i>Timko, Toribio, Hostnik, Burns</i></p>

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DAY 2 (continued) Friday, October 11		
Time (Eastern Time)	Topic	Presenter(s)
12:20-1:00 pm	Lunch	
1:00-1:50 pm	The Ruminant Abdomen <ul style="list-style-type: none"> Examination of abdomen in cattle and small ruminants Physical diagnosis of ruminant abdominal disease Ancillary diagnostic testing for ruminant abdominal disease 	<i>Lakritz</i>
1:50-2:40 pm	ECG Interpretation <ul style="list-style-type: none"> Obtain and interpret standard electrocardiography leads in large animals Recognize normal rhythms and common arrhythmias in large animals Recognize complex arrhythmias in large animals Explain/describe treatment of common and complex tachy and bradyarrhythmias in large animals 	<i>Rhinehart</i>
2:40-3:30 pm	Interpretation of Diagnostic Tests for Endocrine Disease <ul style="list-style-type: none"> List diagnostic tests for EMS and their advantages/disadvantages List diagnostic tests for PPID and their advantages/disadvantages Develop a diagnostic plan for equids suspected to have endocrine disease Case discussion 	<i>Burns</i>
3:30-3:50 pm	Break	

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DAY 2 (continued)
Friday, October 11

Time (Eastern Time)	Topic	Presenter(s)
3:50-5:50 pm	<p>Labs – 60 minutes each rotation</p> <p>Lab 5: Liver Biopsy</p> <ul style="list-style-type: none"> Identify landmarks for ultrasonographic imaging of the liver on the left and right sides of the abdomen Perform a needle biopsy of the liver on the left and right sides of the abdomen in a standing, sedated horse <p>Lab 6: LS CSF Collection</p> <ul style="list-style-type: none"> List the materials needed for LS CSF collection in the horse. Identify the anatomical landmarks for performing a LS CSF collection Perform LS CSF collection on a standing, sedated horse <p>Lab 7 Bone Marrow Aspiration, Biopsy</p> <ul style="list-style-type: none"> Collect sternal bone marrow aspirate, biopsy Evaluate sample quality after collection Process bone marrow samples for cytology, histopathology <p>Lab 8: C1/C2 CSF Collection</p> <ul style="list-style-type: none"> List the materials needed for C1/C2 CSF collection in the horse Identify the anatomical landmarks for performing a C1/C2 CSF collection Using ultrasonography, identify the site for performing a C1/C2 CSF collection Perform C1/C2 CSF collection on a standing, sedated horse 	Timko, Toribio, Hostnik, Burns
5:50-6:00 pm	Break	
6:00-8:00 pm	Dinner – Discussion: Surviving a LAIM RTP	All
8:00 pm	Shuttle to Hotel	

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DAY 3 Saturday, October 12		
Time (Eastern Time)	Topic	Presenter(s)
7:45 am	Shuttle to OSU Galbreath Equine Center	
8:00-8:40 am	Cervical Imaging Interpretation <ul style="list-style-type: none"> • Discuss indications for cervical imaging in large animals • Discuss collection of laterolateral and oblique lateral cervical radiographs and assessment of their quality • Describe common radiographic abnormalities of the cervical spine in large animals • Case examples 	<i>Burns</i>
8:40-9:20 am	CSF Analysis and Interpretation <ul style="list-style-type: none"> • Describe the formation and functions of CSF • List indications and contraindications for CSF analysis • Describe proper collection and handling of CSF samples • Describe the characteristics of normal CSF and changes that occur with disease 	<i>Wellman</i>
9:20-10:00 am	Urinary Tract Imaging <ul style="list-style-type: none"> • Recognize which imaging technique is most appropriate for the presenting complaint • Describe the various transabdominal windows to image equine kidneys • List potential ultrasonographic abnormalities to support AKI and CKD • Recognize the endoscopic anatomy of the lower urinary tract in male and female horses 	<i>Hostnik</i>
10:00-10:20 am	Break	

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DAY 3 (continued) Saturday, October 12		
Time (Eastern Time)	Topic	Presenter(s)
10:20 am - 12:20 pm	<p>Labs – 60 minutes each rotation</p> <p>Lab 8: C1/C2 CSF Collection</p> <ul style="list-style-type: none"> List the materials needed for C1/C2 CSF collection in the horse Identify the anatomical landmarks for performing a C1/C2 CSF collection Using ultrasonography, identify the site for performing a C1/C2 CSF collection Perform C1/C2 CSF collection on a standing, sedated horse <p>Lab 9: ECG Interpretation</p> <ul style="list-style-type: none"> Identify common tachy- and bradyarrhythmias of large animals Identify common ECG artefact <p>Lab 10: Cystoscopy</p> <ul style="list-style-type: none"> Know the materials needed for urethroscopy and cystoscopy in in the male horse Obtain urine from the bladder of a male horse Perform urethroscopy and cystoscopy in a gelding Identify endoscopic anatomy of the lower urinary tract in a gelding <p>Lab 11: Gastroscopy</p> <ul style="list-style-type: none"> Identify normal anatomy of the equine stomach: antrum, pylorus, and proximal duodenum Perform gastroscopy and duodenoscopy on a standing, sedated horse Obtain gastric and/or duodenal biopsies on a standing, sedated horse 	<p><i>Hostnik, Rinehart, Timko, Burns</i></p>
12:20-1:00 pm	Lunch	

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DAY 3 (continued) Saturday, October 12		
Time (Eastern Time)	Topic	Presenter(s)
1:00-1:40 pm	EGUS and IBD – Pathophysiology and Diagnosis <ul style="list-style-type: none"> • EGUS <ul style="list-style-type: none"> ○ Understand the differences in the pathogenesis of equine squamous gastric disease vs equine glandular gastric disease ○ Formulate and interpret a diagnostic plan for equids suspected to have equine gastric ulcer syndrome ○ Develop a treatment plan for equine squamous gastric disease and equine glandular gastric disease • IBD <ul style="list-style-type: none"> ○ Understand the classification system of inflammatory bowel diseases in equids ○ Identify the clinical signs associated with inflammatory bowel disease in equids ○ Formulate and interpret a diagnostic plan for inflammatory bowel disease in equids ○ Develop a treatment plan for equids diagnosed with inflammatory bowel disease 	Timko
1:40-2:20 pm	Upper Urinary Tract Disorders – AKI and CKD <ul style="list-style-type: none"> • List anatomical and physiological features of upper urinary tract • List causes of acute kidney injury (AKI) and chronic renal disease (CKD) • Describe the pathophysiology of AKI and CKD • List diagnostic approaches to AKI and CKD • Discuss therapeutic management for AKI and CKD 	Toribio
2:20-3:00 pm	Lower Urinary Tract Disorders <ul style="list-style-type: none"> • List anatomical and physiological features of the lower urinary tract • List lower urinary tract disorders and complications • Describe the pathophysiology of lower urinary tract disorders • List diagnostic approaches to lower urinary tract disorders • Discuss therapeutic management to lower urinary tract disorders 	Toribio

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3:00-3:30 pm	Break	
3:30-5:30 pm	<p>Labs – 60 minutes each rotation</p> <p>Lab 8: C1/C2 CSF Collection</p> <ul style="list-style-type: none"> • List the materials needed for C1/C2 CSF collection in the horse • Identify the anatomical landmarks for performing a C1/C2 CSF collection • Using ultrasonography, identify the site for performing a C1/C2 CSF collection • Perform C1/C2 CSF collection on a standing, sedated horse <p>Lab 9: ECG Interpretation</p>	<i>Hostnik, Rhinehart, Timko, Burns</i>

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DAY 3 (continued) Saturday, October 12		
Time (Eastern Time)	Topic	Presenter(s)
	<ul style="list-style-type: none"> Identify common tachy- and bradyarrhythmias of large animals Identify common ECG artefact <p>Lab 10: Cystoscopy</p> <ul style="list-style-type: none"> Know the materials needed for urethroscopy and cystoscopy in in the male horse Obtain urine from the bladder of a male horse Perform urethroscopy and cystoscopy in a gelding <p>Lab 11: Gastroscopy</p> <ul style="list-style-type: none"> Identify normal anatomy of the equine stomach: antrum, pylorus, and proximal duodenum Perform gastroscopy and duodenoscopy on a standing, sedated horse Obtain gastric and/or duodenal biopsies on a standing, sedated horse 	
5:30-6:00 pm	Break	
6:00-11:00 pm	Shuttle to Ohio State Fairgrounds – All-American Quarter Horse Congress (dinner on own at the Congress)	

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DAY 4 Sunday, October 13		
Time (Eastern Time)	Topic	Presenter(s)
7:45 am	Shuttle to OSU Galbreath Equine Center	
8:00-8:30 am	Myelography <ul style="list-style-type: none"> Using the background lecture recording and material have a good understanding of how to perform plain radiographic and CT cervical myelography in the horse, and anatomy of the vertebral canal The session lecture will discuss when myelography is appropriate, potential complications, interpretation of images and their relation to spinal compression and intervertebral nerve compression 	<i>Burns</i>
8:30-9:00 am	Disorders of Energy Metabolism in Large Animals <ul style="list-style-type: none"> Discussion of the pathophysiology, diagnosis, and treatment of: <ul style="list-style-type: none"> - Pregnancy toxemia - Bovine ketosis - Hyperosmolar syndrome and insulin resistance of camelids 	<i>Lakritz</i>
9:00-9:20 am	Break	
9:20-11:50 am	Labs – All Attendees Participate Lab 12: Miscellaneous Procedures <ul style="list-style-type: none"> Perform AO CSF Collection/Myelogram Demonstration, IV Anesthesia, Intrathecal Lidocaine Euthanasia, Post-Mortem Renal Biopsy, Tracheotomy, Thoracotomy, Enucleation, etc 	<i>Burns, Toribio, Hostnik, Timko, Lakritz</i>
11:50-12:10	Break	
12:10-1:10 pm	Lunch and Course Wrap Up	

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