

**Advanced Large Animal Cardiology**  
**October 23-25, 2025**  
**Penn Vet's New Bolton Center | Kennett Square, PA**

DAY 1 Thursday, October 23, 2025		
Time (Eastern Time)	Topic	Presenter(s)
7:30-8:00 am Lobby	<b>Registration</b>	
8:00-8:15 am Woerner Amphitheater	<b>Welcome and Introductions</b>	<i>Dr. Virginia Reef</i>
8:15-8:45 am Woerner Amphitheater	<b>Lecture: Importance of Echo Image Standardization: Report from the ASE Equine Standards Committee Co-Chair</b> <ul style="list-style-type: none"> <li>• Understand importance of standardization of echocardiographic images.</li> <li>• Learn the accepted image orientation for right and left parasternal echocardiographic images.</li> <li>• Learn the M-mode, 2D, and Doppler echocardiographic measurements that should be obtained in a standard examination.</li> <li>• Learn the M-mode, 2D, and Doppler echocardiographic measurements that should be obtained in an animal with the common cardiac abnormalities.</li> </ul>	<i>Dr. Claire Underwood</i>
8:45-9:15 am Woerner Amphitheater	<b>Lecture: Cardiac Implications of Sedation &amp; Anesthesia</b> <ul style="list-style-type: none"> <li>• Understand the cardiovascular effects of sedatives.</li> <li>• Understand the cardiovascular effects of anesthetic agents.</li> <li>• Learn the effects of sedation on echocardiographic parameters.</li> <li>• Assess cardiac specific risk factors for anesthesia-related mortality and morbidity.</li> </ul>	<i>Dr. Charlotte Iversen</i>

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DAY 1 (continued) Thursday, October 23, 2025		
Time (Eastern Time)	Topic	Presenter(s)
9:15-9:45 am Woerner Amphitheater	<b>Lecture: Determining Severity of Valvular Regurgitation: Implications for Treatment, Performance, Safety and Longevity</b> <ul style="list-style-type: none"> <li>Understand pressure half-time and how to use it to estimate AR severity.</li> <li>Understand how the aortic root diameter changes between early and late systole in AR.</li> <li>Understand proximal isovelocity surface area (PISA) and how to use it to assess MR severity.</li> <li>Understand vena contracta (VC) and its use to assess MR severity.</li> </ul>	<i>Dr. Virginia Reef</i>
9:45-10:15 am	<b>Lecture: Diastology for the Internal Medicine Specialist</b> <ul style="list-style-type: none"> <li>Learn the 4 phases of diastole.</li> <li>Learn the 3 determinants of diastolic function.</li> <li>Understand the types of diastolic dysfunction.</li> <li>Understand the effect of age on diastolic function.</li> </ul>	<i>Dr. Virginia Reef</i>
10:15-10:30 am Lobby outside Woerner	<b>Break</b>	
10:30-11:00 am Woerner Amphitheater	<b>Lecture: Echocardiography in the Emergency Patient</b> <ul style="list-style-type: none"> <li>Learn which cardiac conditions are likely to present as emergencies.</li> <li>Prioritise standard echocardiographic techniques for emergency patients.</li> <li>Understand how hypovolaemia may impact echocardiographic variables.</li> <li>Learn which echocardiographic images are important for diagnosis of acute cardiac conditions.</li> <li>Learn how to integrate echocardiographic findings with treatment choices.</li> </ul>	<i>Dr. Celia Marr</i>

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DAY 1 (continued) Thursday, October 23, 2025		
Time (Eastern Time)	Topic	Presenter(s)
11:00-11:30 am Woerner Amphitheater	<b>Lecture: Sepsis and the Heart: Myocardial Depression and Myocarditis</b> <ul style="list-style-type: none"> <li>• Learn which patients and presentations are likely to involve myocardial depression and myocarditis.</li> <li>• Prioritize standard echocardiographic techniques which help identify myocardial depression and myocarditis.</li> <li>• Understand how advanced echo techniques may add diagnostic information in cases with myocardial depression and myocarditis.</li> <li>• Understand how to integrate echo data with other diagnostic findings.</li> <li>• Learn how to integrate echocardiographic findings with treatment choices.</li> </ul>	<i>Dr. Celia Marr</i>
11:30 am-12:00 pm Woerner Amphitheater	<b>Lecture: Sepsis and the Heart: Endocarditis</b> <ul style="list-style-type: none"> <li>• Identify risk factors for endocarditis.</li> <li>• Understand the pathogenesis of infective endocarditis in horses.</li> <li>• Learn how to diagnose endocarditis and differentiate suspected from confirmed cases.</li> <li>• List treatment goals and understand how to deliver these.</li> <li>• Be familiar with likely clinical progression and how to monitor horses with infective endocarditis.</li> </ul>	<i>Dr. Celia Marr</i>
12:00-1:00 pm Alumni Hall	<b>Lunch</b>	

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DAY 1 (continued) Thursday, October 23, 2025		
Time (Eastern Time)	Topic	Presenter(s)
1:00-6:00 pm  Scott Building: Stations 1-5  Treadmill Stall East: Station 6	<b>Echocardiography Labs</b> – 1 hour per station with 30-minute break in the middle; rotate through 4 of 6 stations Horses with a variety of cardiac abnormalities will be echoed with assistance from the instructors. Stations will focus on right parasternal imaging planes and measurements, left parasternal imaging planes and measurements, color flow and continuous wave Doppler evaluation of jets and shunts, color and pulsed wave tissue Doppler imaging, obtaining images for speckle tracking and 4D echocardiography. <ul style="list-style-type: none"> <li>• Obtain the standard right and left parasternal views for 2D and M-mode echocardiography.</li> <li>• Apply color flow Doppler echocardiography appropriately to find regurgitant jets and shunts.</li> <li>• Apply tissue Doppler to the atrial and ventricular myocardium for evaluation of myocardial contractility and obtain appropriate images for speckle tracking.</li> </ul>	<i>Dr. Virginia Reef</i> <i>Dr. JoAnn Slack</i> <i>Dr. Cris Navas de Solis</i> <i>Dr. Gunther van Loon</i> <i>Dr. Celia Marr</i> <i>Dr. Charlotte Iversen</i>
6:00 – 7:30 pm Allam House	<b>Welcome Reception</b>	

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DAY 2 Friday, October 24, 2025		
Time (Eastern Time)	Topic	Presenter(s)
8:00-10:00 am  Scott Building: Stations 1-5  Treadmill Stall East: Station 6	<b>Echocardiography Lab (continued)</b> – 1 hour per station; rotate through remaining 2 stations	<i>Dr. Virginia Reef Dr. JoAnn Slack Dr. Cris Navas de Solis Dr. Gunther van Loon Dr. Celia Marr Dr. Charlotte Iversen</i>
10:00-10:30 am Lobby outside Woerner	<b>Break</b>	
10:30-11:00 am Woerner Amphitheater	<b>Lecture: Paroxysmal Atrial Fibrillation and Complex Arrhythmias: A Common Cause for Poor Performance?</b> <ul style="list-style-type: none"> <li>• Learn the common types of complex arrhythmias during exercise.</li> <li>• Learn the prevalence of paroxysmal atrial fibrillation and complex arrhythmias in horses of different disciplines.</li> <li>• Describe the association of paroxysmal atrial fibrillation and complex arrhythmias with performance.</li> <li>• Describe the association of paroxysmal atrial fibrillation and complex arrhythmias with safety.</li> </ul>	<i>Dr. Cris Navas de Solis</i>
11:00-11:30 Woerner Amphitheater	<b>Lecture: Underlying Heart Disease in Horses with Atrial Fibrillation: Lessons from Copenhagen</b> <ul style="list-style-type: none"> <li>• Understand the effects of atrial fibrillation on the heart.</li> <li>• Learn about the athlete's heart and the association with atrial fibrillation.</li> <li>• Learn about the electrical, functional, and structural remodeling in AF.</li> <li>• Learn about omics and the association with atrial fibrillation.</li> </ul>	<i>Dr. Charlotte Iversen</i>

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DAY 2 (continued) Friday, October 24, 2025		
Time (Eastern Time)	Topic	Presenter(s)
11:30-12:00 pm Woerner Amphitheater	<b>Lecture: Ablation of Equine Arrhythmias: Where are we?</b> <ul style="list-style-type: none"> <li>Understand the basic principles and technique of mapping and ablation in horses.</li> <li>Understand the indications for mapping and ablation in horses.</li> <li>Recognize the limitations for mapping and ablation in horses.</li> <li>Understand mechanisms of common arrhythmias.</li> </ul>	<i>Dr. Gunther van Loon</i>
12:00-1:00 pm Alumni Hall	<b>Lunch</b>	
1:00 pm-1:30 pm Woerner Amphitheater	<b>Lecture: Antiarrhythmic Drugs for Ventricular Arrhythmias: When to Treat and How to Choose?</b> <ul style="list-style-type: none"> <li>Understand mechanisms of ventricular arrhythmias.</li> <li>Risk assessment of ventricular arrhythmias.</li> <li>Work-up of a horse with ventricular arrhythmias.</li> <li>Recognize the different case-dependent treatment approaches.</li> </ul>	<i>Dr. Gunther van Loon</i>
1:30-2:00 pm Woerner Amphitheater	<b>Lecture: Remote cardiac monitoring by an implantable device: the holy grail?"</b> <ul style="list-style-type: none"> <li>Understand the principles of remote monitoring.</li> <li>Practicalities for implanting a device.</li> <li>Indications for remote monitoring.</li> <li>Appreciate the limitations of remote monitoring by an implantable device.</li> </ul>	<i>Dr. Gunther van Loon</i>
2:00-2:30 pm Woerner Amphitheater	<b>Lecture: Incorporating Wearables in Your Practice</b> <ul style="list-style-type: none"> <li>Learn the current wearables that provide clinically useful information for cardiovascular assessment.</li> <li>Learn the relevant variables to monitor using wearables.</li> <li>Learn the associations between variables measured by current wearables and relevant clinical outcomes.</li> <li>Discuss approaches to implementing the use of wearables in clinical practice.</li> </ul>	<i>Dr. Cris Navas de Solis</i>

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DAY 2 (continued) Friday, October 24, 2025		
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2:30-2:45 pm Lobby outside Woerner	<b>Break</b>	
2:45-6:00 pm  Scott building, Woerner amphitheater, Widener conference room, Moelis conference room, cardiology office, cardiology small exam room	<b>Interactive Sessions</b> – 50 min per station; rotate through 3 of 6 stations <ul style="list-style-type: none"> <li>• ECG Challenge</li> <li>• Reading exercising ECGs</li> <li>• Improve your echocardiographic anatomical insights</li> <li>• Echocardiographic measurements</li> <li>• Case reviews</li> <li>• Echopac workstation.</li> </ul>	<i>Dr. Virginia Reef</i> <i>Dr. Claire Underwood</i> <i>Dr. JoAnn Slack</i> <i>Dr. Cris Navas de Solis</i> <i>Dr. Gunther von Loon</i> <i>Dr. Charlotte Iversen</i> <i>Dr. Celia Marr</i>

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DAY 3 Saturday, October 25, 2025		
Time (Eastern Time)	Topic	Presenter(s)
8:00-11:00 am  Scott building, Woerner amphitheater, Widener conference room, Moelis conference room, cardiology office, cardiology small exam room	<b>Interactive Sessions</b> – 50 min per station; rotate through 3 of 6 stations <ul style="list-style-type: none"> <li>• ECG Challenge.</li> <li>• Reading exercising ECGs.</li> <li>• Improve your echocardiographic anatomical insights.</li> <li>• Echocardiographic measurements.</li> <li>• Case reviews.</li> <li>• Echopac work station.</li> </ul>	<i>Dr. Virginia Reef</i> <i>Dr. Claire Underwood</i> <i>Dr. JoAnn Slack</i> <i>Dr. Cris Navas de Solis</i> <i>Dr. Gunther von Loon</i> <i>Dr. Charlotte Iversen</i> <i>Dr. Celia Marr</i>
11:00 am -11:30 am	<b>Lecture: Goats are the new dog: Client demand vs realities of caprine cardiology:</b> <ul style="list-style-type: none"> <li>• Appreciate knowledge and gaps in our understanding of caprine cardiology.</li> <li>• Understand the challenges of managing congenital and acquired heart disease in goats.</li> </ul>	<i>Dr. JoAnn Slack</i>
11:30 am -12:15 pm Alumni Hall	<b>Lunch</b>	
12:15-12:45 pm Woerner Amphitheater	<b>Lecture: Spit happens! The joys of camelid cardiology</b> <ul style="list-style-type: none"> <li>• Understand normal basic echocardiography of llamas and alpacas.</li> <li>• Understand normal cardiac rhythms of llamas and alpacas.</li> </ul>	Dr. JoAnn Slack



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DAY 3 (continued) Saturday, October 25, 2025		
Time (Eastern Time)	Topic	Presenter(s)
12:45-1:15 pm Woerner Amphitheater	<b>Stump the Experts: Case Presentations by Participants: Panel Discussion (10–15-minute case presentation; 15–20-minute discussion)</b>	<i>Dr. Emilie Setlawke and Panel</i>
1:15 -1:45 pm Woerner Amphitheater	<b>Stump the Experts: Case Presentations by Participants: Panel Discussion (10–15-minute case presentation; 15–20-minute discussion)</b>	<i>Dr. Meg Miller Turpin and Panel</i>
1:45-2:15 pm Woerner Amphitheater	<b>Stump the Experts: Case Presentations by Participants: Panel Discussion (10–15-minute case presentation; 15–20-minute discussion)</b>	<i>Dr. Amy Polkes and Panel</i>
2:15-2:45 pm Woerner Amphitheater	<b>Stump the Experts: Case Presentations by Participants: Panel Discussion (10–15-minute case presentation; 15–20-minute discussion)</b>	<i>Dr. Carol Clark and Panel</i>
2:45 pm	<b>Course concludes</b>	