This is the famous Seven Mile Beach on Grand Cayman Island, where the 2017 AAEP Resort Symposium was held.

Sporthorse Focus

The 2017 AAEP Resort Symposium focused on many aspects of sporthorse practice.

Story and photos by Kimberly S. Brown

The 2016 demographics of the AAEP membership showed that nearly 30% of members' primary type of practice was performance (which excluded racehorses). Performance horse practice was second only slightly to pleasure/farm practice in terms of the number of members involved.

The 2017 AAEP Resort Symposium's in-depth focus was on sporthorse practice, with three speakers covering multiple topics of interest to veterinarians who deal with performance horses and their owners. While it would be impossible to relay all the information provided in the Resort Symposium sessions, we have included coverage from selected presentations and summaries from all presentations.

The Resort Symposium was sponsored by IDEXX and Merial, with Merial providing sponsorship to bring you this information in *EquiManagement*. This year's program was put together by AAEP board member Tracy Turner, DVM, MS, DACVS, DACVSMR, owner of Turner Equine Sports Medicine and Surgery in Minnesota.

Neurologic, Lame or Both?

This topic is one many veterinarians have trouble with; much of the time, their problem centers around trying to convince owners of the correct way to diagnostically proceed when the owners think their horses are lame.

Presenter Amy L. Johnson, DVM, DACVIM (in large ani-

mal internal medicine and neurology), is an assistant professor of large animal medicine and neurology at the University of Pennsylvania's New Bolton Center. Each speaker at the AAEP Resort Symposium was asked to create a take-home message for each topic, and for this presentation, Johnson provided the following statement: "Horses fail to meet performance expectations for many reasons, with lameness being one of the most common. Neurologic disease can mimic or be mistaken for an orthopedic problem, and some horses might have both problems. Careful clinical examination and appropriate diagnostic testing and interpretation are the keys to accurate diagnosis."

Veterinarians need to help owners understand that using a systematic diagnostic approach to cases where neurologic problems could be present is time-intensive, but in the long run, it will "reduce costs to the owner and improve diagnostic accuracy," said Johnson.

Having a good history on the horse can help with the differentiation between a neurologic issue and lameness. This includes knowing the duration and extent of the problem, whether the horse is getting better or worse, whether NSAIDs change the problem, whether there is tripping, falling or exacerbation of clinical signs with a specific movement, etc.

She stressed that the starting point should always be the clinical examination, *not* serologic testing for Lyme or equine protozoal myeloencephalitis (EPM). "Running serologic tests for Lyme and EPM does not help you decide if the horse is neurologic or lame," she stressed. "Just because a lab test is positive or negative should not affect your clinical evaluation."

Johnson said that she prefers to start with a neurologic exam rather than a lameness exam. She reminded veterinarians that "most causes of neurologic disease do not cause pain, with the notable exception of some forms of cervical vertebral stenotic myelopathy (CVSM) or other vertebral arthropathies, such as spondylosis or changes of the articular process joints in the vertebral column."

In general, Johnson said, an equine neurologic exam can be divided into four parts: 1) evaluation of mental status; 2) cranial nerve (CN) exam; 3) evaluation of posture, spinal reflexes and muscle while the horse is standing; and 4) evaluation of gait, posture and postural reflexes while the horse is moving.

She said that the first three can be observed in the horse while it is in a stall, or they can be done with the horse in hand. The goal is to determine whether the horse is normal or abnormal, and to localize the lesion.

Johnson described her typical in-hand exam as follows:

- Walk in a straight line.
- Trot in a straight line (looking more for lameness with this).
- Walk in a serpentine.
- Walk with the head elevated.
- Walk while pulling the tail.
- Walk in small circles in both directions. Johnson said she usually does this herself to spin the horse in both directions, in addition to using a handler, so that she can feel any changes in the horse's willingness or ability to spin in each direction.
- Walk backward.
- Walk over uneven terrain—hills, curbs, etc., with the head neutral and elevated. (Johnson noted that you can see some changes in gait on hills with horses having cervical problems.)

Johnson said that the following characteristics of the horse's gait might be observed at any point during the exam. These observations can help veterinarians diagnose neurologic disease or

More than 100 practitioners gathered at the AAEP Resort Symposium for a program created by Dr. Tracy Turner on sporthorse medicine.

localize neurologic signs to a particular neuroanatomic region:

- long-strided, floating—suggests upper motor neuron (UMN)/general proprioceptive (GP) weakness and ataxia
- short-strided, choppy—suggests lower motor neuron (LMN) weakness or musculoskeletal problem
- rate rhythm, regularity
- is the horse regularly irregular, or irregularly irregular?
- look for proprioceptive deficits/buckling, abnormal limb movement or placement, crossing/interference, pivoting, circumduction

Johnson then offered some notes from her experiences in doing neurologic and lameness exams:

- When walking a horse with its head in the air, you often see the horse drift away from the handler—but be careful to note whether the horse drifts to the same side, even when handler switches sides.
- When doing a tail pull, make sure to note whether it is even side-to-side and how the horse recovers. Remember that calm horses let you pull them to the side.
- Circling is good for diagnosing neurologic problems. Johnson said that if she could only use one diagnostic movement test, she would pick circling. She added that you need to make sure to note whether the horse has limbs that are pivoting or swinging out too widely. "You need a little forward momentum when circling, or you can make a normal horse look ataxic," said Johnson.
- The back-up should look like a trot in reverse, and the horse should not drag its feet. This is an important test for drafts or warmbloods when you are trying to detect shivers.
- When you are walking a horse downhill with its head held up, neurologic horses often "look for the ground" with their front limbs.

"If an abnormal gait is recognized but its origin is not clear, the next step is often diagnostic local or regional analgesia to see if the abnormal gait will 'block out,' in which case musculoskeletal disease is assumed," said Johnson. "If the abnormal gait is not considered 'blockable,' involves multiple limbs or there are other reasons not to perform diagnostic analgesia, a systemic analgesia trial with phenylbutazone or a similar non-steroidal anti-inflammatory drug might yield useful information. Repeated neurologic and lameness examinations are important, particularly after analgesia trials. In most cases, the appropriate diagnostic path will be identified at this point."

Johnson reminded the veterinarians in attendance that a horse might have lameness *and* mild neurologic disease. "Sometimes it is easier to get rid of lameness to see how much that is contributing to the problem," she said.

"I realize there are horses with mild neurologic disease that are doing their current jobs well," she continued. "Hunters, jumpers and dressage horses can do their jobs up to a certain point with low-level neurologic deficits. Then, if they develop lameness, it might be because of a new physical problem rather than the longstanding, low-level neurologic problem. That horse might have been that way neurologically for years."

EPM: One Disease, Many Symptoms

Johnson was again the presenter on this topic, and her take-home message was as follows: "Equine protozoal myeloencephalitis (EPM) is the most commonly diagnosed infectious neurologic disease of horses in the United States. However, widespread equine exposure to the causative organisms leads to over-diagnosis and unwarranted treatment. Application of appropriate diagnostic criteria and the most accurate tests will permit accurate diagnosis. Several treatment options are available for affected horses."

Johnson posed this question to the audience at the AAEP Resort Symposium: Why are there so many EPM and Lyme disease talks? She said it was because we have widespread seroprevalence with occasional disease; multiple testing options; several treatment options; and limited consensus on diagnosis and treatment.

"When these protozoa invade the central nervous system, they can affect any part, causing highly variable clinical signs that might manifest insidiously or suddenly and subsequently progress slowly or rapidly. General proprioceptive ataxia is one of the most common clinical signs of disease and is often

asymmetric, with a mixture of upper and lower motor neuron paresis. Due to lower motor neuron involvement, muscle atrophy (again, often asymmetric) is also common."

She also reminded the audience that a diagnosis of EPM is always presumptive without post-mortem examination. The diagnosis is based on three principles: compatible clinical signs with the disease; exclusion of other diseases; and proof of exposure. In addition, she said that if the horse gets better on phenylbutazone, then it's not EPM.

Johnson discussed the commonly used laboratory tests, which all are based on antibodies, just not the same ones; "different tests, different antibodies," she noted.

She also said that exposure in the absence of CNS infection confounds test interpretation, and that blood contamination of CSF samples can affect results. She reminded the audience that there is natural diffusion of antibodies from the blood that can also be problematic in diagnosing EPM.

She said that general principles for interpretation of EPM test results are as follows:

- A positive serum test indicates exposure to the organism but does not confirm CNS infection, *regardless of the magnitude of the titer*. Low positive serum titers are commonly seen in horses that *do have EPM*, while high positive serum titers are commonly seen in horses that *do not have EPM*.
- A negative serum test usually indicates that the horse has not been exposed to the organism. Rarely, a recently infected horse might show clinical signs prior to seroconversion, in which case repeated testing in 10-14 days should yield a positive result. A positive CSF test is more likely to correlate with an EPM diagnosis than a positive serum test. However, false positives commonly occur due to blood contamination (particularly with WB, less so with IFAT and ELISA) or normal diffusion of antibodies from blood to CSF. Horses with low CSF titers are less likely to have EPM than horses with high CSF titers, but CSF titers are best interpreted in light of serum titers.
- A negative CSF test usually means EPM is not the cause of disease. Rarely, as mentioned above, a recently infected horse will show clinical signs prior to developing a measurable antibody level in CSF; retesting 10-14 days later should yield a positive result.
- The *best way* to diagnose active EPM is to submit serum *and* CSF for quantitative testing and calculation of a serum:CSF titer ratio (or specific antibody index, or C-value), which allows detection of intrathecal antibody production. The serum:CSF titer ratio is calculated by dividing the reciprocal of the serum titer by the reciprocal of the CSF titer. Laboratories that utilize this method have test-specific validated cutoff values and report the calculated ratio; ratios below the cutoff value are indicative of intrathecal antibody production, and ratios above the cutoff value are not.

Facilitator Dr. Monty McInturff said the AAEP Resort Symposium was a 'no-tie' affair, and dressed the part.

Interpretation of Serology

"I only run tests on horses that I think have neurologic disease," stated Johnson, who gave the following notes on interpretation of results.

- Positive = exposure, but does not confirm CNS infection.
  - ▹ Remember: The magnitude of titer doesn't matter!
- Negative = no exposure, and CNS infection is highly unlikely.
  - ▹ Exception = recent infection
  - ▹ If you get a negative result, the repeat testing in 10-14 days if you have a high suspicion of EPM.

Johnson said, "I've previously lost ground on some of these very acute cases when I think they are EPM and they test negative." She said she has learned to begin treatment and re-test.

Regarding whether veterinarians should perform follow-up serology on horses undergoing EPM treatment, Johnson said, "In my honest opinion, follow-up titers usually are not helpful. Their blood titers and response to treatment have not gone hand-in-hand. I haven't been able to link those two."

To reinforce that the magnitude of the serum titer does not necessarily correlate with disease state, she said that she has seen horses with the very low 1:250 blood titer for EPM on the SnSAG 2, 4/3 ELISA die of EPM, and she said she's seen wobblers with high titers of 1:8,000 that were not affected with EPM.

Johnson noted that the updated ACVIM EPM consensus statement for the most accurate diagnosis of EPM is as follows:

- neurologic exam
- exclusion alternative differentials
- immunodiagnostic testing of serum and CSF
  - ▹ intrathecal antibody production
  - ▹ using SAG2, 4/3 ELISA; NhSAG Elisa serum:CSF titer ratios

To Run Tests or Not?

If the horse is neurologic, Johnson said that she almost always runs the serum

plus CSF. If it is a normal horse, there is no indication why testing should be done. On a pre-purchase exam with no neurologic indications, she doesn't run EPM testing. ("Would it be better to be positive or negative?") She does not recommend re-testing during or after treatment, as it is not predictive of treatment response or the potential for relapse.

Treatments

Johnson said she only has experience with the four products that have been approved by the FDA for treating EPM. She added that she almost always uses anti-inflammatories (steroids or NSAIDs) because in post-mortem examinations, there are "tons of inflammatory cells as a host response to the protozoa." She feels that using anti-inflammatories helps reduce collateral damage to the nervous system.

"Sometimes I use two EPM drugs together in severe cases, because they target different pathways of the protozoa," noted Johnson. "Whether it makes a difference, I can't tell you; but it makes me feel better when horses are going rapidly downhill."

Johnson also noted that in her opinion, acute cases respond better than chronic ones. "I can reverse inflammation, but chronic ones that are puttering along for six to eight months and were not treated, then they have neural loss. And by the time you are working them up, they have lost neurons and they will not turn around, even if you get rid of the protozoal infection."

A veterinarian from the audience asked Johnson whether she used folic acid supplementation when treating horses for EPM, and she said she did not.

Another audience question was whether Johnson starts horses on treatment on day 1 of suspicion of EPM, and she said that she does. "If I suspect EPM and the horse has had clinical signs for less than two weeks, I keep on with treatment for two to three weeks until a second negative test is received."

Another veterinarian asked about prophylactic treatment in areas with high exposure. Johnson said she doesn't know what to think about prophylactic treatment, but *if* a horse is in a high-exposure area and has a higher likelihood of exposure and stress, then it might make sense to do that.

"What makes me nervous is that some people think all young horses in high-exposure areas need to be on treatment—then that horse is moved to a situation where it is exposed and it has no immunity built up. Are they subsequently more likely to get disease than if they had been exposed as weanlings in a field and developed some natural immunity?" she asked.

Presentation Summaries From Other Speakers

There were many other exceptional presentations during the 2017 AAEP Resort Symposium, but with limited space to present those presentations, we will instead give you the presenters' summaries for each talk.

Lyme Disease and Neuroborreliosis: What Do We Know?

Johnson also gave this presentation, concluding that "infection with *Borrelia burgdorferi* is common, but rarely results in neuroborreliosis. Horses with neuroborreliosis have variable signs and laboratory results. Therefore, diagnosis is challenging and relies on fulfillment of several criteria plus exclusion of other possible diseases."

Headshaking: Where to Start?

On this topic, Johnson noted that headshaking "... is a self-explanatory syndrome, but diagnosis of the underlying etiology can be difficult, and clinical management can be even harder. Recent investigation has provided more information regarding

Breaks during the 2017 AAEP Resort Symposium offered veterinarians a chance to step outside and enjoy the scenery and comraderie.

the underlying physiologic problem in many cases, and newly described treatment modalities (PENS treatments) can help improve horse comfort."

Cervical Radiographs: A Neurologist's Perspective

"Cervical vertebral problems are a relatively common cause of decreased performance in sporthorses," Johnson concluded after this presentation. "Equine practitioners should be knowledgeable about proper acquisition and interpretation of cervical radiographs, so that they can advise clients appropriately."

Radiography in a Digital Age

The presenter on this subject was Sarah M. Puchalski, DVM, DACVR, of Palm Beach Equine Clinic in Florida, who noted: "Digital imaging has greatly improved the radiographic capabilities of equine practitioners. The common use of digital radiographs also opens the doors for many opportunities and many pitfalls." Her presentation covered commonly encountered problems with acquisition and interpretation, including digital artifacts, artifacts of positioning and factors leading to errors in interpretation.

Advanced Imaging of the Equine Athlete

In this presentation, Puchalski maintained that performance problems in the sporthorse "... take on many different presentations, ranging from unilateral lameness to neurologic dysfunction. Making an accurate diagnosis is universally accepted as critical to appropriate treatment and rehabilitation, yet choosing which of the numerous available techniques remains confusing." She provided a review of nuclear scintigraphy, MRI and CT, also introducing some novel techniques such as PET and robotic imaging. For those modalities she discussed indications, clinical rationale for appropriate use, logistics, practical applications and the costs of the readily available techniques. In addition, she provided numerous case examples to illustrate the use of each technique.

A New Look at Old Problems: Observations on Fetlock Subchondral Injury and Proximal Metacarpal/-tarsal Pain

"Advanced imaging techniques have provided greater insight into problematic anatomic sites," Puchalski noted in this presentation. Her areas of focus were the fetlock, the proximal cannon bone region and novel lameness conditions.

Sporthorse Lameness

In this presentation, Turner noted that sporthorse lamenesses are no different than any other lamenesses, " ... with the exception that they are probably more subtle. The rider, driver or trainer notices issues much sooner. In fact, these issues may be as simple as perceived loss of speed or [an]other performance factor." Turner said that the examination was critical and must be both systematic and thorough.

Gizmos and Gadgets: Witchcraft or Wizardry?

"The horse industry likes gizmos and gadgets, and there are companies that make products to appeal to this interest," Turner said in this presentation. He questioned whether there was evidence that any of these tools have an effect on horses, let alone a beneficial one.

Training and Rehabilitation

In this presentation, Turner advised that in order to be effective, a rehabilitation program "... should utilize specific veterinary and physiotherapy interventions to ensure pain-free range of movement is achievable." He added that along with that pain-free range of motion, the veterinarian must strive to instill in the horse strength, balance and proprioception training using "clinically reasoned treatment protocols based upon evidence-based practice and a thorough knowledge of equine functional anatomy and biomechanics."

Practical Equine Rehabilitation for the Practitioner

"Injections and surgery are the most common sports medicine techniques used by veterinarians," Turner noted in this presentation. "However, veterinarians are learning that the difference between the success and failure of these treatments is aftercare." He added that rehabilitation was based on healing, improving flexibility and physical conditioning, strengthening the injured tissue, then slowly returning to full activity. EM

Editor's note: The 2018 AAEP Resort Symposium will be held January 29-31 in Maui, Hawaii. Registration will be available through the AAEP in the fall of 2017.