

THE MANY FACES OF EPM, TAKE 2

TheHorse.com: Welcome to the webinar! We'll be starting the live Q&A in just a few minutes.

TheHorse.com: Hello everyone, and welcome to our Webinar, The Many Faces of EPM, Take 2! We'd like to introduce tonight's presenters: Steve Reed, DVM, Dipl. ACVIM, Rood and Riddle Equine Hospital; Frank Andrews, DVM, MS, Dipl. ACVIM, director of the Louisiana State University Equine Health Studies Program; Amy L. Johnson, DVM, Dipl. ACVIM, lecturer in clinical studies at the University of Pennsylvania; and W. David Wilson, DVM, MS, BVMS, MRCVS, professor of medicine and epidemiology at the University of California, Davis

TheHorse.com: Drs. Johnson and Andrews will be answering your questions during this live event along with Wendy E. Vaala, VMD, Dipl. ACVIM, Senior Equine Technical Services Specialist for Merck Animal Health. We'd also like to offer thanks to sponsor Merck Animal Health for bringing you this free event. Visit them online at www.merck-animal-health-usa.com.

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TheHorse.com: We have several questions that were submitted ahead of time to answer, so we'd like to ask that you hold any further questions until we finish these. Thanks for your patience!

TheHorse.com: Belinda: Can steaming your hay or alfalfa kill the sporocysts in opossum feces? And if so what temperature does it have to reach?

Dr. Frank Andrews: Dear Belinda: Good questions! There is current research that shows that when *S. neurona* the protozoa that causes EPM is heated to 150 to 160 F for 15 minutes they are killed. It may be possible to steam your hay to this temperature, but you would have to steam the entire flake of hay to kill 99.99% of the sarcocysts in the feed.

TheHorse.com: Denise: My horse has been battling EPM for several years. He's had Marquis initially for several months and then again a few times during relapses. Symptoms include behavioral changes, vision issues (spooking on one side only), LH lameness and total body muscle atrophy in spite of consistent muscle building work and supplements. Does the organism attack the optic nerve? His panic behavior and spooking only started after the diagnosis. How long will it take to know if his muscling will improve?

Dr. Frank Andrews: Dear Denise: Thank you for your question!! I believe that all the signs that you are describing could be attributed to EPM. The protozoa that causes EPM can localize in the brain and lead to behavior signs, like changes in vision, when the optic nerve is infected. All areas of the nervous system can be affected and really depends on the where the EPM bug enters and infects. If *S. neurona* enters into the spinal cord then you will notice muscle atrophy.

TheHorse.com: Cheryl: How often does relapse occur after apparent successful treatment? Had a yearling colt who was diagnosed with acute onset EPM and treated within 24 hours of clinical signs at a veterinary school. He had almost immediate response to therapy, was discharged, treated daily as directed, and did not show any further neurological signs. At 2 in the late summer, he got very overheated on a very hot day (upset over a mare), ate and drank normally that night, and exhibited peracute extreme neurological signs the next morning - extreme ataxia, profound depression, nonresponsive to external stimuli except a whip. We were thinking heat stroke as his temp was 104F. We drove him into the barn where he was under spray all day and high dose IV dexamethazone and fluids. His temp never came down, but he became more responsive by evening and laid down and got up without a struggle several times. The next morning he was comatose, and was euthanized . At 11 PM the first night, he looked as if he was improving, drank water, so we didn't get up to check him. We did not do any testing or a necropsy so have no laboratory answers. Always thought it was heat stroke, but now think he may have had an acute EPM relapse possible associated with his overheating.

Dr. Amy Johnson: No one knows an exact relapse rate for horses—estimates range from 10-25%. Most horses that relapse show very similar signs to the ones they showed during the original EPM episode. It is not clear whether your colt truly had a relapse or whether he acquired a different neurologic disease. I would suspect that it was not actually a relapse since he had a fever, which is not typical for EPM. His signs are more compatible with a viral disease such as West Nile Virus or one of the others (EEE, WEE, EHV, Rabies).

TheHorse.com: Cindy: I had a Tennessee walker that contracted EPM, the symptoms were very obvious, I did not have the spinal tap done. I treated him with the drug Marquis. He seemed to recover, with some minor balance problems. He was unridable. My question is, can EPM return? 2 years after his treatment he seem to develop a spinal/ neurological problem. He seemed to loose control of his hind legs and have allot of back pain. He eventually could not walk and we made the decision to put him down. He was not a show horse or horse of great value but was dear friend and we could not bear to put him through any more pain and suffering.

Dr. Amy Johnson: Yes, EPM can return — relapses are still more common than we would like. It is possible both for horses to relapse (the original infection is 'held in check' by the immune system for a while and then starts to cause problems again) or for horses to be re-infected with the protozoa. We think that relapse is more common that re-infection. The loss of control in the hind legs is a common sign of EPM but the back pain is not, so I wonder if your horse had another problem as well or perhaps injured himself to cause the back pain. It sounds like you made the right decision though I know how hard it is to lose your friend.

TheHorse.com: Carol: I have a horse that recovered from EPM in 2004-she does still drag one hind foot, could you go into some of the common characteristics of recovered horses, spookiness, distrust, food fixation, etc. Thank you

Dr. Amy Johnson: Recovered horses can show a variety of residual problems. The protozoa can affect any part of the central nervous system and therefore any part of the horse's body (from the nose to the tail) could show problems. When neurons (nerve cells) are injured, they may be able to recover. When neurons are killed, they are not replaced. The residual problems you see after a horse recovers from EPM correlate to areas of the central nervous system where neurons were killed. So, whatever signs you see during the initial infection may persist even after the horse eliminates the protozoal infection. The most common residual signs I see in my patients are spinal ataxia (often more severe in one leg), muscle atrophy, and problems with facial/head problems (trouble swallowing, moving the tongue, moving one side of the face, etc).

TheHorse.com: Kathy: Many vets are recommending continuing EPM treatment periodically on a long term basis- at least with Marquis. Is this also recommended with Protazil? Would Protazil have benefit as the follow up treatment to Marquis? - or would it possibly conflict with prior use of Marquis?

Dr Vaala: Hi Kathy. There are a number of different treatment strategies used to try and prevent relapses. No one treatment has proven superior. Maintenance antiprotozoal drug therapy using Ponazuril (Marquis) has been used in this fashion. Protazil (Diclazuril) can also be used in the same manner. There would be no conflict with prior use of Marquis.

TheHorse.com: Darlene: How long after recovery is a horse at risk for recurrence of epm? how long after recovery should a horse be kept on immune boosters such as natural vitamin E.

Dr Vaala: Hi Darlene. Great questions with difficult answers. Horses can experience relapses up to several years after successful treatment, although most relapses seem to occur during the first several months. We speculate that stress may precipitate relapses. Horses with all degrees of initial recovery may experience a relapse. Cycles of improvement and relapse can recur in certain horses over a period of years. When horses relapse they typically display the same signs as when they first showed signs of EPM.

Since we do not fully understand what precipitates relapses in individual horses and it is impossible to predict which horses will be at risk, it is difficult to critically evaluate which “preventive” treatments are working. Vitamin E is prescribed as an antioxidant. I would not continue on excessive doses of vitamin E but rather ensure the diet has normal amounts of vitamin. Not all vitamin supplements are the same — some are more readily absorbed than others. Elevate E is one popular source.

TheHorse.com: Mary: My 5 yr old Quarter Horse Gelding is eight weeks into Marquis treatment. How can I help him rehabilitate to strengthen his back legs. He especially drags his feet going down hill to the point it would seem he cannot pick them up and place them down properly.

Dr. Amy Johnson: That’s a great question — rehabilitation exercises are often overlooked as an important part of treatment. You need to challenge your horse so that he will develop “new” neural pathways and compensate for any neurons (nerve cells) that have been lost but at the same time be careful not to fatigue him to the point that he injures himself. I encourage owners to do a lot of work in hand, gradually increasing the complexity of the exercises as the horse gains strength and coordination. Start in a flat area with good footing — some horses may only be able to walk in straight lines and wide circles in the beginning. As they improve start doing smaller circles, figure 8’s, and more complex patterns. Hill work is an excellent strengthening exercise, but you should start with gradual slopes and walking straight — then add curves and circles to the hill work. Cavaletti poles can be very helpful in improving coordination — start with one pole and gradually increase the number and height of the poles as your horse improves. It can be beneficial to place one end of the pole up on a jump standard or bucket to create an angled pole, and then walk your horse over it in both directions — this will encourage him to lift the limbs on one side of his body higher and really challenge him.

If your horse struggles at any point with an exercise or looks sore, give him a break and go back to the last exercise he was able to perform comfortably to avoid injuries.

TheHorse.com: Patti: I would like to know if I have my horse massaged and she has EPM can it spread the Disease? My horse I believe is in remission for EPM but now is anemic is there anything I can do to get her blood levels up again?

Dr Vaala: Hi Patti. Massage therapy may help with rehabilitation and will not “spread” EPM.

Unfortunately I can not comment on your horse's anemia without more information since there are many causes of anemia. It is not a common sign associated with EPM per se.

TheHorse.com: vmalliet: I own a horse that was diagnosed & treated for EPM at a young age. He seems to be doing well several years later. I have heard that many horses have a recurrence of the parasite. What efforts are being made to find a preventive for EPM?

Dr Vaala: Hi V Malliett, I do not know if there is any ongoing research working on an EPM vaccine. There was a conditionally licensed vaccine that was available up until a couple of years ago. Merck Animal Health is continuing research examining the use of Protazil as a preventative. In the mean time, good management practices to prevent contamination of feed and hay may help.

TheHorse.com: Hi everyone, we have a lot of great questions rolling in! Thanks for your patience as we work on these.

TheHorse.com: Rose: Can horses contract EPM from both the urine and feces of an infected animal? If the horse does not graze (has a dry lot only) and cleans up his hay in the field before dark, how likely is this particular horse exposed to EPM? Is this particular horse considered a low risk?

Dr. Frank Andrews: Dear Rose: The primary source of infection for EPM is from opossum or maybe other wild animal feces. Urine has not been shown to transmit EPM. There is a possibility that the sarcocystis stage could pass through the horse and be found in the horse's manure, but that is less likely. We think that some hay could be contaminated in the pasture prior to baling or during the baling process so anytime you feed hay it could be infected. If wild animals are exposed to the hay in the barn the hay could be contaminated. When your horse is in the pasture it could be exposed to opossum or other wild animal feces and thus could become infected.

Comment From DeAnne Kitson: I have a horse that was diagnosed with EPM. We treated him with the compounded drug for 3 months on 2 separate occasions and each time have seen a recurrence of symptoms. He was very good all spring and summer long, showing hardly any left side weakness and then all of a sudden 2 weeks ago, the weakness and crab walking gait are back. Would I benefit from treating him with a 30 day dose of the Marquis?

Dr Vaala: Hi DeAnne, I am assuming the compounded formulation was a sulfa drug + prymethamine. If a horse experiences a relapse, especially more than one relapse, it may be a good idea to try treating with a different drug class which would include Marquis or Protazil. Occasionally a loading dose of ponazuril (Marquis) is used initially followed by the standard label dose. The same approach could be used with Protazil (diclazuril). Some practitioners have also used two different drug classes at once.

Comment From Dallas Maddox: Do you have any thoughts or info Re: Dr. Ellison of Pathogenes new treatment OROQUIN-10. Also what more is understood about SAG5 . From reading Pathogenes website, they claim Oroquin-10 works better for that phenotype?

Dr. Amy Johnson: Unfortunately I can't answer that question with any first-hand experience. I have never used OROQUIN-10 because it is not an FDA-approved product. SAG-5 is a protein on the surface of *S. neurona* (surface antigen 5) that is expressed by some strains but not others. I don't think we have enough knowledge currently to answer the question about whether certain medications are better for certain strains in naturally-infected horses.

Comment From Kathy: my horse has all the symptoms and is responding to marquis- but had a negative elisa test

Dr. Amy Johnson: Your horse may still have EPM even with a negative ELISA test. It depends when in the course of infection the blood sample was obtained. Sometimes, if the blood is sampled in the early stages of infection, the horse's immune system has not had time to produce measurable antibodies against the protozoa. That is why we often recommend re-testing the blood sample two weeks later — to look for an increase in the blood antibody level (seroconversion). Additionally, it may depend on which ELISA test you used — if your horse was tested on the SAG-1 ELISA but is not infected with a SAG-1 strain, your horse would be expected to be negative.

Comment From Guest: My mare Slick has been on the Tucoprim for going on six weeks now and Ponazuril for three weeks. My vet feels this is a good combination. However he also feels that if she is not better at the end of a month, she is not going to get better. She is 22 years old and recently diagnosed. What are your feelings on this treatment?

Dr Vaala: Guest, there are many different treatment strategies that have proven successful in different horses. Combining different drug classes as you are doing with Tucoprim and ponazuril can be very effective. Unfortunately there is no way to determine how long is long enough when it comes to duration of therapy. Some horses require several months or more of therapy. An important consideration is to determine if your horse is continuing to show improvement.

Since your mare is 22 yrs old, I would recommend checking to see if she has any signs of Cushing's disease (caused by a pituitary tumor that can result in depressed immune function) since this may make her more susceptible to diseases in general. There is a specific treatment (e.g. pergolide) that can be used to treat Cushing's disease. Just a thought given her age.

Comment From Nancy: My horse is recovering from his second bout with epm, 10 years apart. Is there a preventative maintenance dose of the available treatments that I could put him on?

Dr. Frank Andrews: Hi Nancy: I am glad your horse has recovered from EPM! It is difficult to suggest preventive treatment for your horse. There is no treatment that is currently FDA approved for prevention of EPM. Some studies have been published that suggest giving 4X the dose of Marquis once weekly could prevent EPM in horses. See link for more information!! <http://www.reeis.usda.gov/web/crisprojectpages/188771.html>

Comment From Guest: If medication does not eradicate the protozoa, what is the prognosis for a horse that has almost no clinic signs of the disease

Dr. Amy Johnson: If your horse does not have any (or has minimal) signs of disease, I would say that the prognosis is good — the horse's immune system is probably doing its job and eliminating the protozoa. Many healthy horses are exposed to *S. neurona* but never show any clinical signs of disease because their immune systems prevent the organism from reaching and damaging the nervous system.

Comment From Janet: I have heard that sweet feed can carry the protozoa because it isn't cooked. Is this correct? And what about hay? Can a horse pick up the protozoa from hay?

Dr Vaala: Hi Janet, Any feed source can become contaminated with opossum feces containing *S. neurona* sarcocysts. Hay can become contaminated prior to or after baling. Grain becomes contaminated if it is left unprotected. in the barn. High processing temperatures (>140 - 150F) are required to inactivate or kill sporocysts.

Comment From Patti: I have had my horse for two years. Could he have picked up EPM from TN where

he was breed ?

Dr Vaala: Hi Patti, EPM can have a variable incubation period - sometimes as long as 2 years. So it is possible that a horse could harbor S neurona for a prolonged period of time and then some stressor or concurrent illness, etc. suppresses the horse's immune system and clinical signs of EPM appear.

Comment From Johnna: My horse is s/p EPM and Marquis treatment last summer. He had the winter off and was very weak behind this spring. My vet said to find him a good home and that he was not to be ridden. I cried for two days. Because he had significant hyperesthesia I decided to put him on Doxy I had left over. he got better and his hind end got stronger with hill work all summer. Now he just has locking stifles. What can I do for him? Is this from EPM???

Dr. Frank Andrews: Dear Johnna: Sounds like your horse has made some recovery! Your horse could have had EPM and the Marquis was effective in killing the parasite. However, he was left with residual neurologic disease that took much longer to improve. Sometimes tincture of time and good physical therapy is needed to gain recovery of the nervous system. Continue the strength exercises and that should improve the locking stifles!! However, if not consult your vet and see if you need to do more to improve the stifle issues or he has another condition.

Comment From Patti: My horse was dx two weeks ago, he is on Oroquin-10 right now. Gait issues are not the major issue with him. Its mostly depression, fungal infections, coat change and exercise intolerance, Is that common ?

Dr. Amy Johnson: The signs you mention (depression, fungal infections, coat change, and exercise intolerance) are not the most common signs of EPM. The most common signs are spinal ataxia, which is often asymmetrical, and muscle atrophy. However, if the protozoa infect the brain, depression can be a very noticeable sign. Even though you won't find "coat change" mentioned in many of the classic textbook descriptions, I have had a lot of owners comment on horses having a rough/dull hair coat when they develop EPM, and then seen the hair coat improve drastically at the end of treatment, so I do believe that can be a sign. Exercise intolerance would also be possible since even mild changes in a horse's coordination and strength may make the horse's movements less efficient, which will cause earlier fatigue during exercise.

Comment From Terry: Has there been any information gathered regarding incidence of EPM per region in the US?

Dr Vaala: Hi Terry. The incidence of EPM is highest in regions of the country that have opossums. In certain parts of the country, such as the Midwest, more that 60 - 80% of horses are positive on blood test for EPM antibodies. However the incidence of clinical disease usually remains less than 1.0%. The regions of the country with the lowest seroprevalence include the northwest and southwest.

Comment From Johnna: Is hyperesthesia a symptom. Today my horse was very cross after a trail ride (he bucked me off during the ride and tried to bite my feet while riding). This is not typical behavior. He is almost a year past treatment,

Dr. Amy Johnson: Although hyperesthesia can be a neurologic sign, I have not seen very many horses with EPM show hyperesthesia (just one that I can recall). Hyperesthesia is actually more common in neurologic diseases that cause more significant meningitis (inflammation of the meninges) than EPM — diseases like West Nile Virus and neurologic Lyme disease. Also, hyperesthesia can be the result of pain — particularly back or neck pain. If the behavior persists I would definitely have your vet examine your horse. Stay safe!

Comment From Jane: Have you had a case where a horse has tested positive for exposure with questionable clinical signs and then retested a month later negative. what would be the explanation?

Dr. Frank Andrews: Dear Jane: Thanks for your question!! A test that is a weak positive could be negative on the next test if the horse does not have EPM. There is some variability in tests. If the second test is negative then the horse has a > 90% probability of not having EPM.

Comment From Guest: Please comment on decoquinat/levamisole Rx for EPM

TheHorse.com: Please see comments above regarding Oroquin.

Comment From Kathy: I have a horse with all the symptoms of EPM, was treated at the surgery with dms0, banamine, dex, and marquis- is showing good improvement - but the elisa test came back negative. this has happened to a few horses in my area .

TheHorse.com: Hi Kathy, we answered a very similar question earlier by another Kathy. :) Please see above.

Comment From Terry: Before testing CSF, what is looked for in blood work- chemistry, CBC that would make a vet suspect EPM?

Dr Vaala: Terry, there are no specific changes in the CBC or in serum chemistries that are suggestive of EPM. Testing for S neurona antibodies is the only blood test used for EPM. And a positive blood test only indicates past exposure and not necessarily active infection.

Comment From DeAnne Kitson: Has any stem cell research been done on treating horses with residual deficiencies or recurrent episodes of EPM?

Dr. Amy Johnson: I have not heard of anyone systematically investigating stem cells as a treatment for EPM. Stem cell research is still in its infancy as it pertains to equine neurologic disease. I am eager to see whether or not it helps!

Comment From Dwight: 3 1/2 months ago we purchased a horse that was sound but appeared +/-100# under weight. Three days after purchase he was ridden on a 4 hour tail ride with no issue during or through 48 hrs. after. 6 days after purchase unsteady gate was observed. Vet suspected EPM with clinical diagnoses, drew blood for test, 4 wk regiment of Marquis was started. Blood test came back negative, Marquis was continued for balance of 4 wk regiment and horse improved and to date appears to be healthy.

Comment From Dwight: How important is weight management in preventing relapse?

Dr. Frank Andrews: Dear Dwight, horses that are underweight could have issues with weakness after strenuous exercise and not have EPM. However, your vet did see some signs that would suggest EPM and treated based on those signs. I would say that an underweight horse could be stressed and may potentially have EPM. Early treatment could prevent an antibody response. Although other possibilities could explain the weakness that could be unrelated to EPM.

Comment From Kathy: Are marquis and protazil the same” class” of drugs- how are they different?

Dr Vaala: Hi Kathy. Marquis and Protazil are in the same drug class. In vitro studies have demonstrated that the mean inhibitory concentration for diclzauril was less than for ponazuril. The label dose for ponazuril is 5 mg/kg and the label dose for Protazil is 1.0 mg/kg. Both drugs have a wide safety margin.

Comment From Kathy: I consider my horse to have a delicate immune system after contracting EPM - what do you recommend for future vaccinations!

Dr. Amy Johnson: I would definitely recommend giving your horse all of the “core” vaccines — in my area, these would include Eastern/Western/Tetanus, West Nile Virus, Rabies, and Botulism. I highly recommend discussing with your veterinarian which vaccines are considered “core” in your area, and then discussing whether your horse has significant risk factors that would warrant vaccinating for other diseases .

Comment From PattiA: My horse developed EPM at a time in his life when he was most stable, least stressed and fed the best of everything. I live in CA, he is from TN. Why would it become active at a stable time in his life /

Dr. Frank Andrews: Dear PattiA, Thanks so much for your question! Unfortunately, you are not alone! Some horses develop EPM during the time that they are least stressed and we don't know why! There could be some factors in your horse that may predispose it to clinical EPM. Keep him as stress free as you can and treat him as your vet directs.

Comment From PattiA: Can a horse become infected and carry around the parasite for several years before developing symptoms ?

Dr Vaala: Hi Patti, yes, horses can apparently harbor the organism for months, even years, before developing disease. For example, Europe does not have opossums and does not have naturally occurring EPM cases. However, horses that have been imported from the USA have developed signs of EPM more than a year after being imported.

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Comment From Holly Berry: How does Clinacox (Intervet?) compare to Protazil? I understand both are diclazuril based. Also what are your thoughts on colloidal silver as a treatment? Thanks. I have three diagnosed with epm. We think it may have come in in hay somehow.

Dr. Frank Andrews: Dear Holly Berry, thanks for your question!! Clinacox has the same active ingredient as is in Protozil. The compound is diclazuril. The difference is that Protozil is specifically formulated for horses, where as the Clinacox is made for chickens (you have to give a lot of it to get the same dose).

Comment From Lisa: My horse showed unusual signs of EPM by exhibiting focal seizures in front of his withers and then he was unable to move for about 45 minutes of this twitching. I've treated him several times over the course of almost 2 years. I feel like he was infected with EPM when I bought him and 2 years later, the seizures began. He has not experienced the muscle atrophy. I currently have him on Levamisole for 1 week each month and Marquis two days a week. I have been doing this since June. Has anyone on the panel had experience with a routine such as this and with any long term success?

Dr. Amy Johnson: Seizures are definitely an unusual sign of EPM, though I have had several horses with seizures. An active EPM infection can cause seizures, or it can damage the brain and leave a scar that changes the environment of the nerve cells and causes seizures (even though the infection may be gone). If EPM is really the cause of your horse's seizures (which is difficult to know for sure), it may be of benefit to keep him on long-term treatment. I say this because I have had a lot of trouble with horses relapsing when they show signs of infection in the brain (like seizures). I wish I knew what the best protocol was to prevent relapses, but at this point I do not — the research is just not available.

Comment From Guest: Can a horse have EPM and show few clinical signs? Can it be confused with or mistaken for other leg/lameness issues?

Dr Vaala: Hello. Some horses can show vague neurologic signs that may progress slowly and can be confused for a lameness. Unlike true lamenesses, gait abnormalities due to EPM will not block out with local anesthetics. The use of analgesics such as phenylbutazone usually do not improve the gait deficits due to EPM.

Dr. Frank Andrews: Dear Holly: Your question about the colloidal silver is a good one! There are no studies in horses that have shown that colloidal silver is effective in treating or supplementing EPM treatment.

Comment From Lisa: Is it common for horses to recover completely from EPM, and what is the probability of relapse? My horse was diagnosed in May, and treated with a compounded formulation. He appears to have recovered 100 percent. He has no problems walking, no muscle atrophy, he is alert and appears normal to me. But is he likely to relapse?

TheHorse.com: Hi Lisa, we had a similar question earlier; see Dr. Johnson's response to Cheryl at 8:05.

Comment From Johnna: Thanks. Very informative!

Comment From paula: My 16 yr old 1/2 Arab gelding just finished 1 month on Marquis and appears to be improving- when can I do a routine deworming

Dr. Amy Johnson: I'm so glad your gelding is improving! I do not know of any reason why you could not do a routine deworming treatment now — but some veterinarians prefer to give the horse a couple of months to recover fully before giving any dewormers, so that is a consideration. Just to be safe, check with your regular vet first and get his/her opinion!

Comment From Frances: I have a 19 year old Tennessee Walker gelding that was tested for EPM about 6 years ago. What prompted the testing was he started crossing his back legs as he walked. He tested negative. They did see a bit of arthritis in his right hip. Today, he still crosses his back legs and has started dragging his back right foot somewhat. Also, it is difficult for him and me to get his back right foot up.

Dr. Frank Andrews: Dear Francis: Certainly hip arthritis can cause the signs that you are describing, however consult your vet and have him or her evaluate the horse. A blood test could be done in a couple of weeks and if positive could indicate exposure to EPM. Also, your vet could try the horse on Bute and see if the signs go away. If they go away or improve in a day or so then pain could be the cause of the signs.

Comment From Lisa: Do you have any recommendations to help boost the horses immune system so that it can eliminate the protozoa?

Dr Vaala: Hi Lisa, We know *S. neurona* acts like an intracellular pathogen, but we do not know all the ways that the organism eludes the immune system in susceptible horses. So it is difficult to know which immunostimulant would be most helpful. Good nutrition is essential for a healthy immune system. Other immune modulators that have been used include oral levamisole, EqStim given IM and Equimmune given IV. I can not recommend one over the other, although I have used levamisole more than the other products.

Comment From susan: How common are seizures in horses with EPM and what type of seizures are most commonly reported?

Dr. Amy Johnson: As previously mentioned, seizures are uncommon with EPM, though possible. It is much more common to see other signs such as ataxia and muscle atrophy. Most of the horses I see with seizures have a disease *other* than EPM, although I have seen a handful of cases over the last 4-5 years with seizures from EPM. The most common form of seizure I have seen with EPM has been a focal seizure, involving one side of the horse's face +/- body, although I can remember one horse that had generalized ('grand mal') seizures.

Comment From Johanna: I am using a supplement with 10,000 mg of MSM and 100 mg of HA. This has helped s/p EPM. Coincidence?

Dr Vaala: Hi Johanna, MSM has mild anti-inflammatory properties that potentially could help a horse with EPM by decreasing inflammatory changes associated with EPM. I do not know how HA would help improve signs of EPM. Neither drug has any anti-protozoal properties.

Comment From DeAnne Kitson: My horse developed heaves after initial diagnosis of EPM before his relapse. He had been on pasture for 3 years, only being in the barn overnight on the coldest of winter nights. He had shown no clinical signs of having any type of respiratory stress, it happened overnight in the summer. Have you seen any horses with EPM developing heaves?

Dr. Amy Johnson: Yes, I have seen horses that have EPM and heaves, but in those cases I think the diseases developed separately. I do not think that the EPM caused the heaves. Since heaves is a fairly common condition in horses, it stands to reason that there will be a handful of unlucky horses that develop both diseases during their lifetimes.

Comment From Ruth: I have a TB mare who was diagnosed with EPM almost 10 yrs ago. She did not improve much with the Marquis treatment, and she has good days and bad days. She is currently 27 1/2 yrs. old and the biggest fight I have is keeping weight on her. She is getting free choice hay, and 10lbs senior feed that contains 11% fat. Are there any other supplements that I can give her? I realize that her time with me is getting more and more a day by day thing, but I would like for her to have everything she needs to finish out her life to the fullest. She is very picky about her feed too..

Comment From susan: Do steroids have any impact on a EPM relapse?

Dr Vaala: Hi Susan. Steroids potentially could have a detrimental effect by suppressing the horse's immune system.

Dr. Frank Andrews: Dear Ruth: Congratulations on have such a wonderful horse that is 27+ years old!! I would say that you are doing everything you can to help your horse. Your feed is of high quality. You could add corn oil to the senior to increase calories. I also give Succeed paste to horses to help the digestive system and help feed conversion. Also, have your vet check your horses teeth and make sure you don't have parasites that could lead to difficulty in gaining weight.

Comment From Holly Berry: Based on previous comment, what tests are available for lyme disease? Thank you. I appreciate all of your responses. Learning much...

Dr. Amy Johnson: There are several types of tests available for Lyme disease (infection with *Borrelia burgdorferi*). As with EPM, most of the available tests look for antibodies produced by the horse.

These tests include Western blot, kinetic ELISA, IFAT, and a new multiplex ELISA. As with EPM, these tests can be run on blood or CSF samples.

Comment From PattiA: Thank you, this has been informative to a newcomer to the EPM world !

TheHorse.com: For more information on pain management in horses, see more than 210 articles plus free reports and videos in our EPM category: <http://www.thehorse.com/TopicSearch/Default.aspx?n=equine-protozoal-myeloencephalitis-epm&nID=6&ID=60>

TheHorse.com: Glad you're enjoying the session, Patti!

Comment From Johnna: My gypsy cob has never had any muscle loss or head tilting. But besides the weak hind end he lolls his tongue. Is this a symptom? He has been treated with some residual deficit. Exercise intolerance, coughing, locking stifles are some of them. Should I repeat Marquis??

Dr. Frank Andrews: Dear Johnna: You should consult your vet and have him or her do a good neurologic exam. Some residual effect can continue after successful treatment. If you are concerned about the horse still having EPM then further treatment may be necessary to prevent reoccurrence. However, it may take some time to improve all residual neurologic signs.

Comment From Guest: Perhaps it would be helpful to distinguish between the different ELISA tests

Dr. Amy Johnson: Yes — all the testing gets confusing! I am aware of several different ELISA tests:

SAG-1 ELISA (offered by Antech and Pathogenes)
SAG-2, 4/3 ELISA (offered by Equine Diagnostic Solutions)
SAG-5 and 6 ELISA (offered by Pathogenes)

These tests all look for antibodies against surface proteins on the protozoa — the difference is against which protein the antibodies are directed.

Comment From paula: My vet had me give my horse 1 gram of bute daily while he was being treated with Marquis since he was pacing with one side of his body one walking normally. It worked getting his gait back to normal - with only a minor hitch in his get along. I also put him on Promotion EQ as a supplement .

Dr Vaala: Hi Paula. I imagine that some horses with gait abnormalities due to EPM do develop secondary soreness (muscle/bone pain) associated with their abnormal gait. Phenylbutazone might improve the horse's discomfort and improve their gait. I have not used Promotion EQ and can not comment on its use.

Comment From Guest: Thanks for the updates. I appreciate your dedication to the education of this disease.

Comment From Johnna: I use leather straps on my horse's hind fetlocks to encourage him to pick up his feet and not toe drag. Since his EPM diagnosis he trips by not picking up his feet high enough. His front legs buckle from time to time. Beside frequent shoeing what else do you recommend?

Dr. Frank Andrews: Dear Johnna: Sounds like the leather straps are working to encourage your horse to pick up the hind feet. Any physical therapy, ground work, hill work or continued exercise could be helpful in increasing strength and fitness. Good shoeing is important also. Exercise and consistent work is important to maintain strength.

Comment From susan: Getting back to the difference in Marquis and Protazil as mentioned earlier. Did you say that Marquis is a stronger medication than Protazil?

Dr Vaala: Hi Susan, No, Marquis is not a stronger medication. Both drugs have similar modes of action. The dose per lb is actually less for Protazil. than for Marquis.

Comment From Cindy Lynn: I have enjoyed this webinar and learned from it as well. Thank you to the panel for your time and knowledge!

TheHorse.com: We'd like to offer a special thanks to Drs. Johnson, Andrews, and Vaala for taking the time to address this topic and answer your questions tonight. And of course thanks to this event's sponsor, Merck Animal Health, for bringing you this free event. Visit them online at www.merck-animal-health-usa.com.

Comment From Cindy Lynn: My mare has had some weight loss issues prior to the EPM diagnosis..she had heaves from our drought here this summer and was treated for that. She was off feed for a while but now eating a Senior Horse food well..but not so much with hay. Could this possibly be a neurological side effect ? Her teeth are fine..eats the pelleted food fine but seems to ignore hay for the most part.

Dr. Amy Johnson: It is possible that this is a neurologic side effect. EPM sometimes affects the nerve supply to the tongue and/or swallowing muscles, and some horses with these problems find it easier to eat grain than hay. However, it is also possible that your horse has a preference for grain and not hay that is unrelated to EPM!

Comment From Toni: In regards to EPM, is there more relapse in horses after treatment or possible recrudescence?

Dr. Frank Andrews: Dear Toni: Thanks for your question! I consider relapse and recrudescence as being the same and occur anywhere from 10 to 25% of the time after treatment. Certainly we have seen new infections after successful treatment. Relapses are when the clinical neurologic signs are the same after successful treatment, where as new infections are when the reoccurrence of signs are different.

TheHorse.com: That's all the time we have for today's Webinar. Thanks for joining us! If you have suggestions for future topics or any feedback for us, please email us at THWebinars@TheHorse.com. Don't forget, this Webinar will be archived for later viewing, along with a transcript from this chat, at www.TheHorse.com/Video.aspx?vID=534.