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With Program Growth Comes Equipment Needs

Dr. Alison LaCarrubba

As the equine ambulatory program celebrates its 10th anniversary this year we have so much to be excited about. On this anniversary we will be welcoming a transition for our ambulatory program. We will be seeing a larger number of veterinary students through our rotation as we become part of the core equine curriculum. We will now be able to affect and influence more interested young minds. With the addition of more students, we are also excited to be gaining new equipment to support our increasing demands. After 10 years and 240,000 miles, we will be retiring our original ambulatory truck, fondly known as “Edna” and replacing her with a newer version. The new truck will be equipped with a state of the art veterinary box providing more usable space and improving access. We are also excited to be acquiring a new and improved version of our Powerfloat. The Powerfloat company has generously donated a new battery operated float with multiple attachments so we can address a variety of dental issues, including the special needs of miniature horses, without relying on access to electricity.

In an effort to improve our lameness diagnostic services, we will be acquiring a Lameness Locator, as well as a state-of-the-art ultrasound machine with capabilities to perform diagnostic ultrasound examination of the tendons and ligaments of the limb. The ultrasound machine will also improve our reproductive examinations and allow ultrasonographic examination of the abdomen. The Lameness Locator was designed by our



very own Dr. Kevin Keegin, equine surgeon and Chairman of the E. Paige Laurie Endowed Program in Equine Lameness. The Lameness Locator will be donated to the ambulatory program and will provide an objective

means of evaluating lameness in our client horses as well as being utilized as an invaluable teaching aid for our students.

As you can see, this anniversary will be marked by many new additions, both equipment and students. We are excited to be able to offer new and better diagnostics and services. We value our dedicated client base and it's been truly rewarding to watch the program grow and flourish during the past 10 years. I look forward to continued growth and consistent mentorship of up-and-coming equine practitioners. As always, I feel very indebted to our wonderful client base for continued support of our program.

Ambulatory Team Welcomes New Interns

Alison LaCarrubba, DVM

Dr. Alison LaCarrubba, originally from New York, graduated from the University of Missouri College of Veterinary Medicine in 2001. LaCarrubba stayed on at the University to complete an internship in equine medicine and surgery. She then spent a year working in an equine exclusive private practice with a special interest in reproduction. She returned to the University in July 2003. Although the majority of her time is spent in the ambulatory truck, she also devotes time to working with the internal medicine department in the teaching hospital. She completed the credentialing process for the American Board of Veterinary Practitioners in Equine Practice and is now focused on becoming more specialized in equine dentistry. In 2010, she attended a dental seminar hosted by the Missouri Veterinary Medical Association at Longmeadow Rescue Ranch. In October, LaCarrubba will attend an advanced dental course focused on complicated procedures, including extraction, endodontics and periodontics.



Columbia area. She is particularly interested in wound management as well as critical care in the ambulatory setting. Rasch works closely with the referral clinicians in the MU Equine Clinic to provide superior care to horses.

Our interns have a special interest in working with horses, and potentially going on to complete a residency, specializing in either equine medicine or equine surgery. Every June we welcome a new crop of interns. This year our interns include Dr. Rhodes Bell, Dr. Amanda Dolgins and Dr. Kirsty Husby.

Rhodes Bell, DVM

Dr. Rhodes Bell is from Lexington, Ky., where he was exposed to all aspects of the thoroughbred industry via the family farm and his father's training barn. He graduated from Vanderbilt University in Nashville, Tenn., before attaining his Doctor of Veterinary Medicine from Auburn University in 2010. Following graduation, he completed a one-year rotating internship at a private practice in Ocala, Fla. Bell's primary clinical interests include colic, lameness, and laminitis with special interest in the surgical treatment of orthopedic disease, upper airway dysfunction, and colic. He plans to pursue specialty training in equine surgery.



Martha Rasch, DVM

Dr. Martha Rasch is a clinical instructor at the MU College of Veterinary Medicine and focuses on the equine ambulatory practice. Martha was born in Chicago, Ill., and grew up riding hunters and jumpers in St. Louis, Mo. She began to ride in three-day events in college. After earning a DVM at MU, she completed a rotating equine internship at the University. She then continued on to work as a clinical instructor for the equine ambulatory service. She spends the majority of her time instructing senior veterinary students while traveling to work on horses within the



Amanda Dolgins, DVM

Dr. Amanda Dolgins grew up in Santa Cruz Calif., and started riding at a young age. During her undergraduate studies at Cal Poly San Luis Obispo, she worked as a veterinary technician for a surgical facility and continued to do so during veterinary school. She graduated from UC Davis in 2010



Continued on page 3

Mobile MRI Will Help Diagnose Injuries

The Veterinary Medical Teaching Hospital is excited to announce the arrival of the MREquine this fall. MREquine, a Boise, Idaho-based company, will bring state-of-the-art diagnostic capabilities to the Equine Clinic with its mobile MRI machine. The coach that transports the machine will be at the University one time per month and will be able to accommodate three horses each visit.

The MREquine technologists are expertly trained to ensure the best image capturing techniques of the foot, fetlock, cannon bone, carpus, and hock for highly accurate diagnosis. The turnaround time can be as little as 24 hours. MREquine technology, experience, and High Field (1.5T) GE magnet allows MRI on horses to be safer and easier than ever before.

MRI stands for magnetic resonance imaging. The MR image is superior to other imaging modalities for diagnosing soft tissue injuries. MRI can provide a level of detail that is often difficult to achieve with radiographs or other imaging systems. Lameness can be particularly difficult to treat when the cause of the problem cannot be identified. MRI has provided a big step forward in finding specific problems in both bone and soft tissues in the legs of horses. MRI has been proven as a



valuable tool in diagnosing human orthopedic disease for many years and has now become a valued tool for diagnosing equine orthopedic injury. The MRI scans have allowed veterinarians to diagnose problems that were previously unrecognized or difficult to evaluate with different imaging techniques.

MREquine has operated two mobile clinics and is now expanding to the Midwest with a third coach that will be based in Chicago. We are very excited to welcome the MREquine system to the Veterinary Medical Teaching Hospital.

Interns, Continued from page 2

and then completed a one-year internship at Chino Valley Equine Hospital. She has a strong interest in equine surgery and lameness and hopes to obtain a surgery residency following this year. In her free time she loves to cook, spend time with her dog and hopes to get back into riding after taking the last few years off.

Kirsty Husby, DVM

Dr. Kirsty Husby spent time growing up in both Durban, South Africa, and Montclair, Calif. She began riding horses when she was 6, and participated in various eventing competitions during high school. She received her Bachelor of Science in animal science from Iowa State University in 2007, and her Doctor of Veterinary Medicine from Iowa State University

in May 2011. During veterinary school she worked as an ICU technician in the Equine Clinic during the school year, and with the equine surgery service during the summers. Through these experiences she developed an interest in surgery and lameness, and her goal is to enter an equine surgery residency. In her spare time she enjoys training her 5 year-old off-the-track thoroughbred gelding, and hopes to event with him some day.



Therapy Brings Comfort to Retired Racehorse

Pushed Over, also known as Clifford, is a 4-year old thoroughbred gelding who was retired to a Missouri farm in the late spring. Since Clifford's arrival, his has been a story of true inspiration and perseverance. Clifford is a former racehorse who was purchased from Suffolk Downs in Massachusetts in the fall of 2010. He was one of a few horses that was put up for adoption at the track through a thoroughbred rescue organization known as CANTER (Communication Alliance to Network Thoroughbred Ex-Racehorses), a non-profit organization was started in an effort to help racehorses find new homes and new careers after their racing days were over.

Clifford's owners, April and Annie, found Clifford through a friend. When they first visited him at the track his condition was described as deplorable, as he was very thin and had many serious lameness issues. They were taken with his beauty and kind eye and decided to adopt Clifford that day. Clifford was placed in veterinary care immediately and received much attention from his new owners but his prognosis was deemed guarded because he had such severe fetlock joint arthritis and was so painful in multiple limbs. He was originally placed on strict stall rest and then hand walked for months. After six months April and Annie elected to retire Clifford to pasture where he could truly live as a horse should. Clifford arrived in Missouri in the spring and his condition, although improved from his original assessment at the track, was not good. He was very lame in both front limbs. He continued to be thin, would lie down much of the day, and had ulcers on his hips from being down frequently. Although the original plan was for Clifford to be out on pasture with others horses, it became immediately obvious that he was not



sound enough to be turned out with other horses. Clifford was allowed time to adjust to his new environment and he was confined to a small paddock, as complete stall rest caused him to be more painful. When he was left in a stall for too long he became stiff and had difficulty moving.

Severe Arthritis Diagnosed

The equine ambulatory service examined Clifford and found that he was unable to flex either front fetlock. Both fetlocks were markedly enlarged and had essentially no movement. Radiographs were taken and showed the most severe degenerative joint disease of both front fetlocks. In fact, Clifford had functionally fused both joints. This degree of arthritis is very uncommon, even in off-the-track thoroughbreds. The radiographs were taken to a lameness specialist at the University and examined. Knowing that Clifford will never make a riding horse, our goals were to provide him with a greater level of comfort so that he could be turned out with the herd on pasture.

Shortly after the consultation with the surgeon, Clifford was referred to the Veterinary Medical Teaching Hospital for injections into both fetlock joints. The joints had so much bony proliferation around them that the procedure necessitated ultrasound guidance to access the joint space. A lubricant, anti-inflammatory and steroid were placed in each joint. This was to help decrease the inflammation in the joint and improve overall comfort. After this procedure was complete, shock wave therapy was performed, again with the goal of improving the horse's comfort level. Everyone involved had low expectations for significant improvement, but Clifford's loving owners wanted to do all they could for their horse to improve his quality of life.



Continued on page 5

Advancements in Regenerative Therapy: What it Means for You and Your Horse

With a multitude of options in regenerative medicine, stem cells and gene cell therapy are at the forefront of this promising new technology. We are proud to include both PRP (platelet rich plasma) and IRAP (interleukin-1 antagonist protein) as part of our treatment options here at the Veterinary Medical Teaching Hospital.

What is Platelet-Rich Plasma?

Platelets are one of three types of cells circulating the blood stream and they play a key role in the complex cascade of healing. After an acute injury, platelets adhere to the damaged tissue and help form a scaffold to contain the damage. Aside from their physical presence in filling the gap, platelets release growth factors that influence the cells around them. These growth factors stimulate neovascularization, collagen formation and cell division in both muscles and bone.

The goal of PRP is to utilize the growth potential innate to platelets for treatment of tendon and ligament injuries, which are notoriously hard to heal and require lengthy periods of rehabilitation. These injuries account for more than 30 percent of injuries in racehorses and often result in a healed tendon that is weaker than it was before. Current usage of PRP is usually with an acute injury to hasten the early stages of healing. This is done by increasing blood flow to an area that normally receives less than other tissues like skin or bone. Just as in any rehabilitation program, stall rest, bandaging and nonsteroidal anti-inflammatory drugs are pivotal in the first few days to minimize inflammation. PRP injection is a minimally invasive process that can

take place stall side. Blood is taken from the horse and then centrifuged to concentrate the platelets into a small volume. Typically only one injection is necessary, and with standing sedation, the lesion is injected under ultrasound guidance. Once injected, the platelets naturally form a clot, erecting the necessary scaffold for healing and the sustained release of growth factors. Injection into chronic lesions that have become static in their repair has been utilized, but results are more variable.

Even after injection, an appropriate rest and rehabilitation program is important to avoid damaging the new tissue as it forms. Recent studies have shown not only decreases in healing time, but potentially an increased strength in the healed tissue, allowing many horses to perform at their previous level.

What is IRAP?

IRAP (interleukin-1 Receptor Antagonist Protein) is a novel therapy designed for long-term management and prevention of osteoarthritis. Osteoarthritis (OA) or degenerative joint disease (DJD) is often a limiting factor on a horse's peak level of performance. Trauma or repeated use leads to inflammation of the joint capsule which eventually progresses to cartilage damage and bone remodeling. Interleukin-1 is just one of many cytokines that serve as a chemical messenger stimulating this initial response.

Unlike most conventional methods for treating OA that focus on alleviating the discomfort associated with joint inflammation, IRAP is designed to block Interleukin-1 and therefore slow the progression of arthritis.

Continued on page 6

Clifford, Continued from page 4

Within two weeks we were all very excited at the good news. A significant improvement in comfort was noted.

Brighter Future

Clifford was turned out with a herd on a large pasture and continues to move about comfortably. In fact, he was a stallion until recently and seems to have a way with the mares. He typically has one to two mares that he keeps by his side. Although Clifford will not be a performance horse, he is now able to move around freely and enjoy a comfortable life with his herd mates. We have noticed that with improved comfort,

Clifford has a much more relaxed attitude and has been able to put on weight. His overall condition has shown dramatic improvement. We may have to repeat the joint injections and shock-wave therapy, but for now, it has been very rewarding to work as a team to improve this horse's quality of life.

Although Clifford's injuries will prevent him from having a new career, there are many racehorses adopted from the track which go on to have long and productive second careers as hunters, jumpers, dressage horses and eventing horses. It is a win-win situation when you can take a young, healthy retired racehorse and turn a new leaf, both for horse and rider.

Structured Vaccine Program Key to Herd Health

A good vaccination program, catered to your horses' needs and exposure, can be invaluable to preserving the health of your herd. Despite the hurdles of scheduling, expense, and occasionally, needle-shy behavior, a well-timed vaccine regimen can mean the difference between life and death for both you and your horse. Often, these vaccines need to be boosted annually for a horse to maintain immunity and remain protected. Whether the vaccinations are administered by you or a veterinarian, proper selection, storage and administration are important to maximize the efficacy.

Vaccines work by injection of a very small amount of an inactivated infectious agent, such as a virus or bacteria, into your horse's muscle or onto their nasal mucosa. This exposure causes an immune response that produces antibodies to the injected agent. These antibodies are then available to bind to and eliminate a similar threat in the future, such as the actual virus. The vaccine-induced immune response can prevent infection, lessen clinical signs, or speed recovery from the actual disease.

The American Association of Equine Practitioners has established guidelines of vaccination, identifying several core and risk-based vaccines for administration. The following are descriptions of these diseases and the threat to our local horse population.

Core Vaccines

Tetanus (*Clostridium tetani*)

Tetanus is a bacteria that is ubiquitous in the intestine, manure and soil. It often gains entry to the



horse through wounds, lacerations, and umbilici. An affected horse is afflicted with markedly stiff muscles, elevation of the third eyelid, and hypersensitivity to stimuli. This disease progresses quickly and has a very high mortality rate, often through paralysis of the diaphragm. Fortunately, the prophylactic tetanus vaccine is very safe and provides good protection.

Eastern and Western Equine Encephalitis Virus (EEE/WEE)

These viruses are transmitted by mosquitoes to the horse but are not contagious between horses. Often referred to as sleeping sickness, the disease causes profound inflammation of the brain which can result in signs of abnormal mentation (depression), staggering,

Continued on page 7

Regenerative, Continued from page 5

Unfortunately, IRAP can't reverse any of the damage already done, but has been shown to benefit horses with synovitis or moderate osteoarthritis. As this is an autologous therapy (the horse's own blood), there is no risk of disease transmission or immune rejection from foreign proteins. Results are typically seen after the first few treatments. Blood is drawn from the horse and placed in a special syringe to stimulate the production of this unique protein. After 24 hours of incubation, it is then separated from the blood cells to produce a concentrated plasma solution. This initial blood draw provides enough IRAP for multiple injection and current therapies recommend injecting the effected joint every 10 days for a series of three-to-four treatments for optimum results. Although IRAP has been shown to

help OA refractory to other treatments, not all horses are ideal candidates for treatment. We are happy to discuss your options to help determine if this treatment is right for your horse.

Future Direction

Although the field of regenerative medicine is still in its infancy, there are many promising new techniques that we have only begun to explore. These novel therapies are not just for the performance horse, but with their potential to slow the progression of arthritis, can make many horses more comfortable. If you are considering either of these treatment options, we would be happy to discuss them in more detail.

and seizures. EEE has a 70-to-90 percent mortality rate, providing little hope for treatment once the horse becomes affected. The available vaccine is very safe and effective against the virus.

West Nile Virus (WNV)

Also transmitted solely by mosquitoes, West Nile Virus has persisted in the environment through infected birds. This virus causes variable neurological signs, by way of inflammation of the brain and spinal cord. These include fever, muscle tremors, incoordination, and recumbency. Although many horses have recovered from infection, some have permanent neurological defects, and the most severely affected often do not survive. There are two types of vaccine for WNV, killed and modified live. Both are effective.

Rabies Virus

Horses are exposed to the rabies virus through infected wildlife, such as raccoons, skunks or bats. This virus can go undiagnosed initially, allowing infection to spread to humans through contact of the horse's saliva. Serious, progressive neurological signs result and the disease is uniformly fatal within three-to-seven days from the onset of clinical signs. Clinical signs of the disease typically include aggressiveness, depression, incoordination and hypersalivation. This vaccine is safe and effective.

Risk-Based Vaccines

Influenza

Flu is a highly variable virus that spreads quickly between horse through aerosolized droplets and contaminated objects, like water buckets or fences. Infection is manifested as an upper respiratory tract infection that leads to fever, lethargy, nasal discharge, and cough. Most horses recover completely in 10-to-14 days. However, the highly contagious nature of the disease can cause an extensive economic impact when affecting large training barns. The vaccine is moderately effective against the always changing virus, but does require administration two-to-three times per year.

Rhinopneumonitis (Equine Herpes Virus -1,4)

Equine herpes virus is transmitted by nasal secretions or breeding exposure. It can result in several

Adult Horse Core Vaccines

Tetanus
EEE/WEE
West Nile Virus
Rabies

Common Risk-based Vaccines

Herpes (Rhino)
Influenza
Strangles

syndromes, including abortion, neurologic disease, and respiratory disease similar to influenza. After initial exposure, this virus has the ability to become dormant for years. Latently infected horses can act as a source of infection to other horses. Treatment and prognosis vary with the syndrome. Vaccination is only moderately effective against abortion and respiratory disease, with no efficacy against the neurological form, and should be administered two-to-four times per year.

Strangles (Streptococcus equi ss. equi)

This is a bacterial disease that affects young horses, especially in high traffic areas such as boarding barns, horse auctions and training facilities. The disease is highly contagious, resulting in fever, white nasal discharge, respiratory noise, and swollen lymph nodes, especially under the chin and behind the jaw. Most horses recover within a few weeks, gaining natural immunity along the way, but the complication rate is high.

Complications include spread of the disease to other lymph nodes, accumulation of pus in the guttural pouches, and immune mediated vasculitis. The vaccine itself is not without risk and can result in problems, such as causing the disease itself or causing an immune mediated syndrome which can be life threatening. For this reason, this vaccine is reserved for high-exposure situations.

Other vaccines are available and may be indicated after taking into consideration the risk, cost, and vaccine efficacy. If interested in designing or changing the vaccination protocol for your herd, please call for the equine hospital for up-to-date information and advice. We look forward to helping you maximize the protection of your horses from disease risk.

Preparing for Foaling and Foaling Emergencies

The birth of a foal is a beautiful event. Most people who spend time around horses can fondly recall in detail their first experience witnessing a mare foal. While the majority of foalings (up to 95 percent) proceed uneventfully, proper preparation and monitoring can help to prevent those 11 months of anticipation from taking a disastrous turn.

Part of ensuring a successful foaling is establishing an accurate breeding and foaling date. A mare's gestation will last approximately 11 months (335-342 days on average). Occasionally the mare's gestation can be prolonged — usually from being on a pasture primarily made up of endophyte infected fescue. Removal of the mare from fescue grass in the last three months of pregnancy should alleviate most problems related to fescue toxicosis. Induction of foaling is generally not recommended or advisable in the mare and typically results in complications. The old adage, "When the fruit is ripe, it will fall" holds true in most instances.

In the four-to-six weeks prior to anticipated foaling, you should take some extra precautions with your pregnant mare. Vaccination at this time should be performed in consultation with your veterinarian to ensure that the mare's colostrum is of excellent quality for the foal. The mare should be watched more frequently in case she decides that she might like to go a little earlier than anticipated. Her udder should be kept clean in preparation for the foal. Her Caslick's, if placed, should be opened up one month prior to her anticipated foaling to avoid trauma to her reproductive tract during foaling.

Predicting when your mare is ready to foal can be difficult but there are some subtle signs that can be useful. About one to two weeks prior to foaling the sacrosciatic ligament that runs from the back of the mare's vertebrae to her pelvis will become lax and her vulva will become elongated and softer. Twenty-four-to-48 hours prior to foaling the udder will typically begin to "wax." Some stall side kits can help predict when labor is set to begin by monitoring the levels of calcium and magnesium in her udder secretions. If you suspect that she is dripping colostrum prior to foaling, it is important harvest this important first milk and freeze it to have on hand once the foal has arrived. This should be done in conjunction with your veterinarian.

Once labor is initiated the mare will need her privacy, but she should still be monitored closely. If she



feels threatened, she can delay birth of the foal to some degree. Systems are available to help alert you to the fact that your mare is foaling if you are unable to keep a constant eye on her.

The mare proceeds through labor in three stages.

Stage One

The first stage can last anywhere from 30 minutes to six hours and during this time the foal will be changing positions in anticipation of the birth. Mares, particularly younger ones, may appear to act colicky by flank watching and rising and laying down frequently to aid in the repositioning of the foal. Older mares may show no signs at all. This stage culminates with the rupture of the fetal membranes or "breaking water."

Stage Two

The second stage of labor constitutes the expulsion of the foal and should last no longer than 30 minutes. The foal should be coming out similar to a diver into water — with both front legs extended coming out first, quickly followed by the head. If she does not appear to be making progress, some light assistance can be provided by pulling on the foals legs in a downward plane while working with the mare's contractions. If no progress is made even with this assistance, then a veterinarian should be called. As little interference with the process as possible is preferred. Once the foal is born, allow the umbilical cord to break on its own,

Continued on page 10

Causes and Cures of Common Skin Problems

Skin conditions in horses can be caused by a number of different problems, and yet can all manifest in similar ways. We might all be familiar with the terms “scratches,” “sweet itch,” and “rain rot,” but what exactly are these ailments, and how can they be treated or prevented?

Scratches

“Scratches,” “mud fever,” and “greasy heel” are all terms that refer to a general skin irritation that usually occurs at the back of the pastern and heel area, although it can extend further up the leg. Signs may initially be visible as redness and scaling, but may progress to oozing of fluid from the skin, matting of hair, and development of crusts. It is most commonly seen on white legs, especially the hind legs. Horses may be lame as a result of the pain associated with this condition. It is most commonly caused by bacterial infection, and excessive moisture in the environment is considered a significant predisposing factor.

Once this condition has been diagnosed by your veterinarian, it is usually treated by clipping the hair, cleaning the area with warm water and an antiseptic solution, softening and removing scabs, and application of topical anti-microbial and anti-inflammatory ointments. In more severe cases systemic antibiotics or steroids may be prescribed. Recurrence is common, and preventive measures are important for susceptible horses. Prevention should be geared toward keeping the horse’s legs clean and dry. Clipping long hairs on the lower limb and keeping horses stalled during wet weather can help decrease the occurrence of this condition.

Hives

Hives are another common equine skin condition, and may occur with no obvious symptoms, or horses may experience itching, pain, or open sores. Hives are frequently seen as a result of skin allergy, with the most common allergy being to the saliva of *Culicoides* midges, which is frequently referred to as “sweet itch” or “summer eczema.” Lesions are often seen on the mane, back, and tail, and are intensely itchy causing

the horse to scratch, which may result in hair loss, self-trauma, and even secondary bacterial infections.

Severe cases can be treated with steroids or antimicrobials for secondary infections, but prevention is the best option in this case. Insecticides and fly blankets can serve as a barrier to the midges landing on the horse, and keeping the horse stabled with a fan during the times when the midges are most active can also be effective if you have a susceptible individual.

Rain rot

“Rain rot” or “rain scald” is a bacterial skin infection that commonly causes streaks of hair loss that resemble paintbrush strokes over the back and along the croup of the horse. It is caused by the bacteria *Dematophilus congolensis*, and two important predisposing factors are skin damage and moisture. Skin damage could be due to biting insects, prickly vegetation, or other skin conditions. It is thought the bacteria can live in dormancy within the skin, and become activated under the right conditions leading to this disease. Hairs can be matted together, and when plucked off they may reveal crusting, or oozing of blood or pus.

A veterinarian can diagnose this condition fairly easily, and treatment will depend on how severely affected the horse is. Mild cases can be treated by keeping the horse dry, removing the crusts, and applying topical antimicrobials or using an antibacterial shampoo. More severe cases may require systemic antibiotics. Prevention strategies include insect control measures, keeping the skin dry, and applying sun screen to white areas of the horse. This condition is contagious to other horses, and it is advisable to use separate tack, blankets, and grooming supplies for infected and non-infected horses.

Although there are multiple other skin diseases, this is a brief overview of the more common problems. General management and health strategies for prevention include providing a good quality diet, proper grooming, insect control measures, and daily observation for changes in hair coat. If a skin condition is suspected, horse owners should work with their veterinarian to devise a treatment and prevention strategy that works for them.

as the stretching will prevent the cord from bleeding excessively in most instances.

Stage Three

Stage three of labor concerns the passage of the fetal membranes (placenta). This stage can last 30 minutes up to three hours. If the placenta has not passed within three hours it is considered retained which can have dire consequences on the health of the mare and a veterinarian should be consulted. You may tie up the placenta using baling twine to prevent the mare from stepping on it but it should not be cut, pulled upon, or have excessive weight applied to provide excess traction.

A good basic guideline following the delivery of the foal is the One- Two- Three-Rule:

- Foal up in one hour;
- Nurse by two hours;
- Placenta passed from the mare, and meconium passed from the foal by three hours.

Knowing when to call the veterinarian is of vital importance to the viability of the foal and the mare. If the mare isn't making swift progress during stage two of labor or if you notice the foal is malpositioned a veterinarian should be called immediately. If the foal is a "red bag" the first thing you will see coming out are fetal membranes that are red and opaque rather than clear. This means that the placenta has prematurely separated from the uterus and the foal is not receiving nutrients or oxygen from the mare. This is a true emergency and the membranes should be opened immediately and the foal pulled to prevent oxygen deprivation.

Many cases of dystocia, or difficult birth, can be remedied on the farm with simple manipulations performed by the veterinarian with the mare standing. If the problem is not one that can be corrected within 20 to 30 minutes, then referral to the veterinary medical teaching hospital should be advised where more effective manipulation can be performed with the mare under general anesthesia. Uncommonly, delivery via Cesarean section is necessary.

The vast majority of foalings proceed without a hitch and it truly can be the most extraordinary event. Knowledge of the normal events surrounding birth and recognizing potential problems early on will help to ensure the best outcome for the mare and foal.



Outbreak of EHV Considered Over

According to the USDA the equine herpesvirus (EHV) outbreak, which started in Ogden, Utah, in April of 2011 is considered to be over. The National Cutting Horse Association Western National Championships was the site of a 'Perfect Storm' which allowed a highly contagious virus to be passed among horses at the show grounds. The show horses returned to their respective states before any symptoms of the disease were obvious. Before long it was evident that more than 400 horses in 19 states from California to Illinois and including Missouri were exposed to the highly contagious EHV. An additional 1,685 horses which shared stables and pastures with the show horses were also exposed.

Equine herpesvirus is highly contagious and typically results in respiratory disease, abortion in mares, neonatal foal illness and death and less commonly, neurological disease. The disease is thought to have been present since the 1700s, with the most recent outbreaks of the serious and contagious neurological form, EHV myeloencephalopathy (EHM) occurring in Ohio in 2003, Kentucky in 2005 and Colorado in 2007.

EHV is spread through the air, by equipment that has been contaminated, such as buckets and tack, as well as by human contact. Most commonly, horses affected with EHV show signs consistent with upper respiratory tract disease, such as nasal discharge, coughing, and fever. We commonly vaccinate horses against EHV which provides some degree of protection against

Continued on page 12

Targeted Deworming Strategies

Although most aspects of equine medicine have dramatically changed since the 1960s, our philosophy and the paradigm surrounding our deworming protocols have gone mostly unchanged. It was in the early 1960s that the first broad spectrum dewormers were introduced to the market. Based on the life cycles of the common parasites and the parasites that caused the most problems at the time, it was recommended that horses be dewormed every eight weeks.

Now we know now that 20 percent of our horses carry upwards of 80 percent of the worm burden. We know not all horses should be treated equally. Some horses will carry a higher parasite burden and accordingly will be dewormed more frequently, but most horses will maintain a low level of parasitism and can be dewormed much less frequently. This will not only save horse owners money, but it will address an ever growing problem of parasite resistance.

The parasite we are most concerned about these days is called the small strongyle, or cyathostome. Cyathostomes have developed resistance to many of our common dewormers and some populations have even started to show resistance to our heavy hitters like ivermectin. As we do not have any great new product emerging on the market in the near future, this may present a very big problem for our horses in the long term.

We know that along with our chemical dewormers, pasture management can play a big role in parasite management in our equine friends. Cyathostomes live about 4-to-5 cm above the ground surface so we know that letting horses on overgrazed, short cropped pastures increased exposure to these parasites. Also, horses graze closer to manure piles when the pastures are overgrazed and this also increases parasite exposure. It is a good idea to spread the manure in the pasture during the hottest, driest time of the year, which would be August in Missouri. The eggs are susceptible to the heat and will not survive these conditions. It is recommended that the pasture be rested for two weeks after dragging. On the other hand, you want to be sure NOT to spread the manure during the cool, wet times of year as this will only spread the eggs around increasing risk for horses to ingest them.

Cyathostomes can remain encysted in what we call a hypobiotic state in a horses GI tract for many months. It is difficult to detect how many parasites a



horse is hosting because the worms do not lay eggs while they are encysted, thus they don't show up in the fecal egg count. The danger is that when a horse undergoes a stressful situation the parasites will all excyst at the same time causing inflammation of the GI tract, colic or colitis or diarrhea. That is one of the reasons we recommend deworming even the lowest shedding horse two times per year.

The current recommendations for deworming horses are to first figure out if your horse is a high, moderate or low shedder. We can run a fecal egg count on the manure and determine the number of eggs found per gram of feces. This quantitative analysis will then give us more exact numbers to determine how often your horse needs to be dewormed. Currently, counts under 200 eggs per gram are considered insignificant, 200-to-400 epg are low shedders, 500-to-1000 epg are moderate, and > 1000 epg are considered to be high shedders.

The first year you switch your horse to this method of deworming it is best to check the fecal egg counts three-to-four times. Do the first check eight to 10 weeks after the horse has been dewormed. If the count is <200 epg, then recheck in eight weeks. If the count is < 1000 recheck in four weeks. This will help determine which category your horse falls into. Horses that are low shedders can then be dewormed two times per year, in the spring and fall. Be sure to use moxidectin to address any encysted cyathostomes and praziquantel one time per year to address tapeworms. Horses that are high shedders can be dewormed four times per year. It is important to understand which horses in the herd are high shedders and deworm them accordingly in order to minimize pasture contamination. If you have any questions regarding a program designed specifically for your horse please feel free to call and talk to us at any time.

EHV, Continued from page 10

both respiratory disease and abortion in mares. However, the vaccine does not provide protection against the neurological manifestation of the disease. Along with that, recrudescence of a latent infection can explain how EHV can show up in a closed herd.

There is no specific treatment for EHV/EHM so our therapies are targeted at supportive care. Anti-virals designed to treat humans can be utilized but have a significant cost associated with them and have not been shown to be reliably effective once the horse is showing signs of neurological disease. Once an outbreak of the disease has been identified, it is critical to implement control and prevention measures as soon as possible. Isolation of any affected or suspected animals is critical. In an effort to prevent future outbreaks it is important for horse owners to understand how the disease is transmitted and what precautions to take while attend-

ing horse shows or other events. Taking proactive steps like disinfecting stalls, not having a shared water source, taking the horse's temperature daily, and not allowing the public access to the stabling area, which can result in people petting multiple animals without washing, hands can all help prevent the spread of this disease.

The outbreak of EHV/EHM which started in Ogden, Utah, was a reminder of the necessity of being alert and aware of the potential dangers of the virus. A total of 57 horses, half of which were at the actual event and half which contracted the disease through contact after the event were confirmed infected with EHV-1. Another 33 horses were confirmed to have EHM (the neurological symptoms). In total, 13 horses either died or were euthanized. The impact of this outbreak was devastating, both from an economic standpoint, as well as an emotional standpoint. We hope that horse owners will remember to be vigilant and aware when attending future equine events.