

AAEP Focus on Disease Treatment, Prevention

We continue our summary of applicable horse care information that veterinarians presented at the 55th Annual American Association of Equine Practitioners convention, held Dec. 5-9, 2009, in Las Vegas, Nev. The following shorts describe the directions researchers around the country and world are taking with disease treatment and prevention. The topics focused on gastrointestinal and other forms of illness, biosecurity, anesthesia, and pain management. You can find the full Wrap-Up of the AAEP convention for horse owners, veterinarians, and other professionals at TheHorse.com/AAEP2009.

Painkillers and Gastric Ulcers

If you've ever given the oral non-steroidal anti-inflammatory drug phenylbutazone (Bute) to a horse, you've probably been warned that it can cause gastric ulcers if you give too much or give it for too long. Thus, there's always interest in pain-relieving medications that work while causing less gastric irritation or none at all.

Suxibuzone is a medication often given to horses because the

horse's body converts it to Bute, in theory giving it all the anti-inflammatory and pain-relieving effects of Bute while minimizing stomach irritation. However, a study presented at the convention might have disproved that theory, at least for recommended dosages.

Dr. Frank M. Andrews, director of the Equine Health Studies Program at Louisiana State University, reported that for the study, 18 horses were housed in stalls, fed sweet feed and hay twice daily, and given omeprazole for eight days before anti-inflammatory medication was given to reduce any pre-existing ulcer scores. Horses were then divided into three groups for a 15-day medication period:

- Group 1 received 2 grams of Bute twice daily at 12-hour intervals on the first day, then 1 gram twice a day.
- Group 2 received 3 grams of suxibuzone twice daily at 12-hour intervals on Day 1, 1.5 grams twice daily on days 2-4, then 1.5 grams once daily for days 5-15.
- The control group received no meds.

Just before the medication phase, one horse randomly assigned to the Bute group had an ulcer score of 1; the rest scored 0. After



Gastric ulcers can be side effects of chronic use of non-steroidal anti-inflammatory drugs

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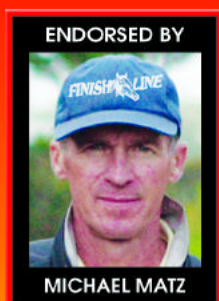
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15 days of treatment, all treated/control horses had similar median scores, indicating that at these dosages, suxibuzone was no better for the stomach than Bute.

“Suxibuzone protection is more likely to be observed when these drugs are administered at higher dosages or to young or debilitated animals,” noted Andrews, citing a study that

found fewer ulcers in horses given more than double doses of these meds.

“Both top-dress formulations were readily consumed and... neither formulation resulted in excess gastric ulceration when administered per label recommendations,” he noted. “Furthermore, no protective effect on gastric mucosa was seen for suxibuzone compared with phenylbutazone.”

Improving Peritonitis Treatment

“Prompt and aggressive treatment of peritonitis is often essential in horses,” began Dr. Olivier M. Lepage, of the University of Lyon, in France.

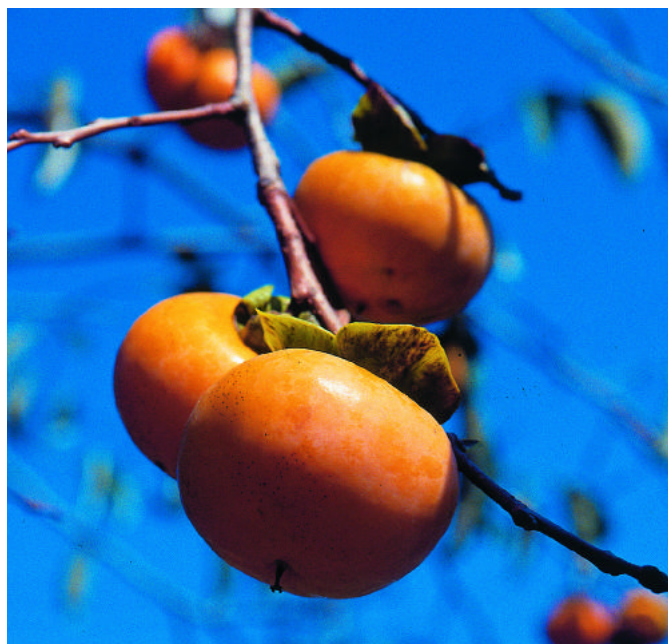
Peritonitis, defined as inflammation of the peritoneum (membrane lining the abdomen), can result from many problems, from disease to infection following injury or colic/colic surgery. Regardless of the cause, vets commonly lavage (flush) the abdomen after handling the primary cause of the peritonitis. They use many liters of fluid to lavage the abdomen, and the quicker they get it all out, the better.

Lepage and colleagues compared drainage rates of a special multiple fenestrated catheter (having holes along its length) and a typical Foley catheter (having one hole at the end). “The multiple fenestrated balloon catheter was effective for the collection of lavage fluids in adult standing horses,” he said, noting that more than 60% of the lavage solution was recovered in less than an hour in 83% of procedures using the fenestrated catheter, and in only 33% of procedures with the Foley catheter. Using two of the fenestrated catheters instead of one did not appear to offer any additional benefit.

“Based on this study and on the authors’ experience, this catheter is justified in clinical cases of peritonitis, pleurisy in adults, and uroperitoneum in foals,” Lepage said.

Hold the Persimmons, Please

A persimmon is a bright orange fruit that’s claimed to have many human health benefits, from helping prevent cancer to arresting the hiccups. However, persimmons have a dark side—they can form hard “concretions,” or fiber masses, in the gastrointestinal tracts of horses and humans that can require surgery to remove.



Ingested persimmons can form hard, fibrous masses in a horse’s gastrointestinal tract

Such masses—bezoars—are even harder in texture and more difficult to resolve when made of persimmon bits. They’ve even earned their own special name: diospyrobezoars.

Dr. Heidi Banse, a resident at Oklahoma State University, presented a study on the outcomes of 13 cases referred to five different university hospitals from 2001-2008 for diospyrobezoar-related problems. She reported that all horses exhibited colic, weight loss, or diarrhea, and that 10 of them presented in fall or early winter.

Twelve of the 13 cases were treated and eight survived at least four months after treatment. Seven had stomach bezoars; the other was in the intestines. Banse noted that medical treatment of

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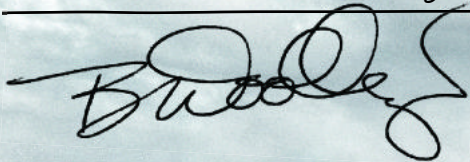


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stomach bezoars can take several weeks, but it's usually successful. Diet restriction (pelleted feed) and large amounts of Coca-Cola (yes, really) are used to dissolve the bezoar.

However, she noted that surgery is warranted

in intestinal diospyrobezoar obstruction because of the risk for intestinal perforation. Two of the four horses in this series that had surgery survived.

Evaluating Salmonella Biosecurity

Vets take *Salmonella* very seriously because it can cause severe equine and human GI disease. Thus, most equine hospitals have biosecurity measures to avoid spreading *Salmonella* (or any other infectious organism) that enters the hospital.

"Most large-animal hospitals have a 'zero tolerance' goal for nosocomial (hospital-acquired) salmonellosis," noted Dr. Harold C. Schott II of Michigan State University. He discussed the evolution of MSU's *Salmonella* biosecurity program over the last 10 years.

"Although zero tolerance may be the goal, infectious organisms can be introduced to a hospital with any horse (healthy or sick), and spread between patients can occur rapidly," he said. "Thus, the true goal of a biosecurity program is to rapidly identify when 'bad bugs' may enter...and limit the risk of spread to other horses and/or personnel. Further, biosecurity programs often need to be tailored for both the infectious agent and specific hospital design."

Typical biosecurity program measures:

- Establishing traffic flow patterns (i.e., treating infectious horses last);
- Detailing specific indications for patient isolation (i.e., known *Salmonella* infection or contact with a *Salmonella* case);
- Establishing cohort housing of various risk levels (i.e., keeping GI cases together, away from the reproduction unit);
- Screening patients for fecal shedding of *Salmonella*;
- Monitoring disinfection efficacy with environmental cultures; and
- Encouraging good staff hygiene.

Such practices vary across facilities based on facility design and other challenges, he noted. He detailed biosecurity practices at MSU and results.

"Control of nosocomial infections is important in any type of large-animal hospital," Schott said. "Protocols must be developed and placed into practice to identify when an increasing number of infections are occurring in order that a rapid and effective method of controlling outbreaks may be undertaken...when surveillance for disease is implemented, the opportunity to detect outbreaks of both nosocomial disease and colonization is also increased.

"Unfortunately, improved biosecurity programs are not always completely effective in limiting nosocomial infection rates," he added. "Thus, biosecurity remains an ongoing challenge that requires strict compliance to protocols coupled with effective communication to encourage all

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personnel to understand why such protocols are necessary. Furthermore, ongoing evaluation of the efficacy of biosecurity programs and regular re-evaluation of protocols used is critical in the effort to reduce *Salmonella* nosocomial infection rates in equine hospitals.”

DMSO Doesn't Help Gastric Aspects of Endotoxemia

Endotoxemia, the presence of microbe-derived toxins in the bloodstream, is “one of the most severe and ubiquitous disease processes in horses,” said Dr. Gal Kelmer, of The Hebrew University, in Jerusalem, Israel.

Endotoxemia delays gastric emptying, which can cause the stomach to retain acidic contents and cause or worsen gastric ulcers. At worst, it can lead to reflux material accumulation and gastric rupture.

Because many effects of endotoxemia are due to oxidative damage, Kelmer and colleagues at the University of Tennessee investigated the effects of the antioxidant dimethyl sulfoxide (DMSO) on delayed gastric emptying caused by experimentally induced endotoxemia. They found that it did not improve the condition.

“DMSO may be less effective in the management of endotoxemia in horses than was previously thought,” he concluded.

Painkillers and Analgesics

“There has been a large increase in awareness of treating pain in horses; many practitioners want to know how to do it better,” said Dr. Nora Matthews, of Texas A&M University, who discussed current analgesic (painkiller) use in horses.

Analgesics help an injured or ill horse feel better, eat more, lose less weight, stay in the hospital for a shorter time, and often avoid chronic pain, she explained. Potential disadvantages include that the horse might make the injury worse by being too active because he doesn't hurt as much, that painkillers can slow down the gastrointestinal tract (potentially contributing to colic), that the cost of many painkillers is high, and that masking pain can also mask worsening of the condition.

Vets must assess equine pain by evaluating physical mechanisms (such as heart rate and levels of cortisol, often called the stress hormone), responses to pressure on the sore area, changes in force plate results for lameness cases, and changes in behavior. One of the hardest things about studying pain in horses is that there are various systems for grading pain and improvement; it's much more difficult to assess pain objectively than “harder” targets such as levels of substances in the bloodstream.

Painkillers can be given in two main ways: systemically (orally, intravenously, intramuscularly, etc.), or locally to block pain in a specific area of the body. Matthews expressed hope for the newer transdermal (through the skin) analgesic options, which are less invasive than many other administration routes and, thus, better tolerated by horses and their owners.

Non-steroidal anti-inflammatory drugs such as Bute (phenylbutazone) and Banamine (flunixin meglumine) are the “mainstays” of equine analgesia as they reduce the pain of inflammation, reported Matthews. However, there are many other classes of analgesics used in horses and many ways to give them; she described the advantages, disadvantages, and modes of action of all of them.

“Balanced analgesia is important, in which we use several different drugs that work on different receptors,” she noted. “Lower doses of each drug equal fewer side effects.”



Non-steroidal anti-inflammatories such as Bute and Banamine, reduce the pain of inflammation

She advised treating pain early when possible, rather than waiting until a horse is three-legged lame or refusing to eat. “If we wait until pain is agonizing, then we often can't control it,” she explained. “This should be expected from what is known about pain. Our expectations for analgesics must be realistic, and we should measure food and water consumption (to note any changes that might be due to significant pain).”

Matthews finished her talk with the following wish list for equine painkillers:

- Universal pain scoring system for horses so all veterinarians and researchers are on the same page when evaluating and comparing analgesic effects;
- Practical analgesic delivery methods;
- More formulations of currently used drugs so they can be given via different routes, depending on the patient's problem and situation;
- More information about analgesics and their effects on gastrointestinal motility, including more information on common drug combinations; and
- New drugs/formulations that will be long-acting, can be given

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orally, and are practical for field use. "Effective treatment of equine pain is what every equine practitioner strives to achieve," she stated. "However, the profession is still a long way from the ultimate goal, and much research and information are still needed."

Kester Disease/Disease Prevention Topics

Dr. Bonnie R. Rush, professor of equine internal medicine at Kansas State University, was one of the presenters in the Kester News Hour session, discussed also in the March 20 issue of *The Blood-Horse*. Following are the disease and disease-prevention topics she summarized from the previous year of equine research at various institutions.

Bacteremia in foals—In a *Journal of the American Veterinary Medical Association* study, scientists evaluated the records of 423 foals presented to the University of Florida with bacteremia, or bacteria present in the bloodstream, over a 25-year period. Researchers reported that *Escherichia coli* was the most frequently identified pathogen and that surprisingly, susceptibility of the bacteria to common antibiotics did not decrease over time (except for rarely used enrofloxacin).

Factors that improved survival rate were the year (better treatment success rates as time went on), diarrhea, lower body temperature, higher neutrophil count (a type of immune cell), and higher arterial blood pH (lower acidity in the blood). Younger age, septic arthritis, higher band neutrophil count, and higher serum creatinine levels generally worsened the outcome.



Foals surviving bacterial infections of the bloodstream were just as likely to start racing as were their unaffected maternal siblings

Rush reported that surviving foals were just as likely to start—and to have the same number of starts—as unaffected maternal siblings. However, they had fewer wins and less total earnings (\$3,967 vs. \$12,931).

Rhodococcus equi transmission—These bacteria, which can cause a virulent pneumonia in foals, have previously been thought to be spread by exposure to contaminated manure (possibly via inhaling contaminated manure dust). A study published in the *Journal of Clinical Microbiology* found that "the concentration of virulent *R. equi* organisms in exhaled air from foals was five to 12 times higher than that in environmental air," reported Rush. "Rhodococcal pneumonia has classically been categorized as an opportunistic infection; this study indicates *R. equi* may be a contagious pathogen.

"There were no significant differences in the median concentrations of virulent *R. equi* bacteria exhaled by clinically healthy or diseased foals; foals on endemic farms may be challenged and have subclinical infections," she continued. "The high concentrations of virulent *R. equi* bacteria in exhaled air suggested that aerosol transmission between foals is possible and may have a significant impact on the prevalence of *R. equi* pneumonia on farms. There may be less contact time required for a foal to get an infectious dose of *R. equi* from exhaled air compared to environmental contamination. Both sources may contribute to clinical disease."

Piroplasmiasis—Rush reported that in 2008 there were just over 20 cases of equine piroplasmiasis in Florida, and the outbreak appeared to be spread by blood doping/contaminated needles. Previously, the United States had been free of piroplasmiasis since 1988.

"In June of this year (2009), there were seven cases in Kansas and Missouri, and it looked like blood doping was the transmission method again," she said. "But in October a 7-year-old Quarter Horse got the disease, and now there are 334 cases in 12 states (most are in Texas). All of them have previously lived on the index (initially affected) premises, and now we're worried about other modes of transmission, such as natural spread of disease. The tick population may be contaminated; this will really be something to watch out for this (upcoming) year." ■

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