

# AAEP Focus on Horse Health News

**W**hat was the hottest news in equine veterinary medicine in 2009? During the popular Kester News Hour session at the annual American Association of Equine Practitioners (AAEP) convention, three top veterinarians (who focus on equine reproduction, internal medicine, and lameness/surgery) summarized the top news topics and the most significant research reports of the year for a record crowd of equine veterinarians.

The presenters during the convention, held Dec. 5-9 in Las Vegas, Nev., were:

- Dr. Scott E. Palmer, hospital director and a staff surgeon of the New Jersey Equine Clinic in Clarksburg, N.J., and past president of the AAEP and American Board of Veterinary Practitioners;
- Dr. Margo L. Macpherson, associate professor and section chief in reproduction at the University of Florida, and past president of the American College of Theriogenologists; and
- Dr. Bonnie R. Rush, professor of equine internal medicine at Kansas State University.

## Medicine

### Compounded medications

The very public death of 21 polo ponies in April 2009 due to an incorrectly formulated compounded vitamin/mineral supplement (excessive levels of selenium) “was one of the biggest stories of 2009, drawing international attention to the sport of polo and the profession of medication preparation,” said Palmer.

Macpherson noted that several factors contributed to the situation, not just a single mistake. “It’s important for us to recognize what we need to learn from this situation,” she commented, recommending veterinarians should take American Medicinal Drug Use Clarification Act guidelines very seriously. Rush described these as follows:

- A veterinary/client-patient relationship must exist;

- The health of the animal must be threatened;
- The compounded medication must be made from FDA-approved, commercially available products;
- The amount of product compounded must be consistent with the needs of the animal identified in the prescription;
- Veterinarians should be very careful of the types of products they use;
- Prescriptions must be written clearly and legibly;
- Pharmacies must employ stringent quality control practices.

Rush weighed in on the compounding discussion as well, adding a summary of a study published in the *Journal of the American Veterinary Medical Association (JAVMA)* on the compounding and storage of pergolide mesylate (used to treat equine Cushing’s disease). Pergolide was withdrawn from the human medication market in 2007 due to concerns over its contribution to heart problems, but it’s still widely used in horses as a compounded product. The study found that pergolide degrades to the point that it shouldn’t be used after only 14 days in typical barn storage conditions, and after only 30 days when refrigerated in a dark container.

“If a color change occurs (from opaque white to brown), the drug should be discarded,” advised Rush. “Remember, day one for you with the product might not be day one of the product; it might have already been one week old when it was

shipped, or may have been exposed to heat during delivery.”

She also made the following comments regarding compounding in general:

- Compounding is not permissible just because the bulk drugs are regulated;
- Neither cost nor convenience is justification for using compounded preparations; and
- The prescribing veterinarian assumes liability when using compounded preparations.

See an upcoming issue of *The Blood-Horse* for more medicine topics, from disease prevention to vaccination. Full study references for the medicine topics can be found at [TheHorse.com/15795](http://TheHorse.com/15795).

## Upper Airway Topics

### Exercise-induced pulmonary hemorrhage

A study published in *JAVMA* and described by Rush as “one of the most logistically complicated studies of the decade” definitively answered the long-standing question of whether furosemide (Salix/Lasix) reduces the incidence of exercise-induced pulmonary hemorrhage (EIPH, airway bleeding). She said the researchers took over a South African track for four days and assigned 167 horses to race in fields of nine to 16 animals. Half the horses were given furosemide in a randomized, placebo-controlled, blinded, crossover design; then they were raced by apprentice jockeys in non-recorded races. After a seven-day washout period, the trial was repeated under the exact same conditions, but with the other half of the horses receiving furosemide.

“We knew bleeding impaired performance, and we knew furosemide improved performance, but we didn’t know if furosemide really reduced bleeding,” said Rush. “We now know. More than 80% of the horses in this study bled without furosemide, and less than 60% bled on the medication. No horses bled at Grade 3 or 4 levels on furosemide, and two-thirds of horses that bled without furosemide had a reduction of at least one grade of severity in their bleeding.

“This wasn’t six horses running on a treadmill; these were real-world conditions,” commented Rush. “They have answered a 30-year-old question.”

Rush reported that more than 92% of Thoroughbreds running in North America race on furosemide, and that the drug’s use costs more than \$100 million

annually in the United States.

More information can be found at [www.TheHorse.com/14438](http://www.TheHorse.com/14438).

Another EIPH study published in the *Equine Veterinary Journal* that Rush discussed focused on the mechanisms of EIPH within the lung. Researchers found EIPH resulted in thickened pulmonary (lung) vein walls and reduced inner diameter of the veins in the rearward portion of the lung.

"With thickened walls, the vein can't expand when blood pressures increase from exercise," commented Rush. "This increases pressure at the level of alveolus and may contribute to stress failure of the capillaries."

#### **Predicting soft palate displacement**

Dorsal displacement of the soft palate (DDSP) is a condition that intermittently causes loud respiratory noise and decreased performance in athletic horses. Endoscopic examination at rest usually doesn't correlate well with the events during exercise. Palmer said that, in a recent study, researchers found an ultrasonographic assessment of the larynx (voice box) position was useful to help diagnose DDSP in racehorses. Horses suffering from DDSP tended to have a more ventral (lower) position of the larynx as seen on ultrasound.

#### **Dynamic respiratory endoscopy**

Many dynamic respiratory abnormalities can cause poor performance in racehorses and are difficult to diagnose at rest. The *Equine Veterinary Journal* ran a study in which researchers used a respiratory endoscopy system on horses working under saddle (in the past, dy-

namic exams could only be done on a treadmill under less-than-natural conditions). Palmer reported the image quality was good and the scope was well-tolerated by the horses.

The most common respiratory abnormality seen was DDSP (19% of horses). Laryngeal cartilage asymmetry and collapse, and axial deviation of the aryepiglottic folds were also noted. The findings of the dynamic exam did not correlate well with the findings of a respiratory endoscopy exam while the horses were standing still.

"We can perform the exam while the horse is actually working in company of other horses, which is impossible on a treadmill," he noted. "This may very well become the gold standard for evaluating upper airway disorders on the track."

#### **Surgical techniques for recurrent laryngeal neuropathy (RLN)**

Partial or complete paralysis of the left side of the larynx can reduce racehorse performance and caused significant airway noise. Palmer discussed two studies reviewing surgical techniques used to treat this problem. Investigators in the first study found in Thoroughbred racehorses that the common approach of waiting until paralysis is complete before going to surgery is a poor choice.

The second study used a novel technique called audio spectral analysis to measure the noise horses make when working with RLN-caused upper airway obstruction. The investigators found when comparing ventriculectomy (removal of the laryngeal sacculle) and ventriculocordectomy (removal of the laryngeal sacculle and the adjacent vocal cord)

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procedures for treating upper airway noise in draft horses with RLN, the latter procedure was more effective (although both reduced airway noise).

Full study references for the upper airway topics can be found at [TheHorse.com/15794](http://TheHorse.com/15794).

## Lameness and Surgery Topics

### Shock wave therapy for wounds

Although extracorporeal shock wave therapy (ESWT) is generally used to treat orthopedic problems, Palmer discussed one study published in *JAVMA* that found weekly shock wave therapy shortened (from 90 days to 76 days) the healing time of experimentally created wounds of the lower limb. There was no significant difference in the quality of healing between ESWT-treated limbs and controls, and the mechanism for the shortened healing time is unclear.

### Racing speeds—have they topped out?

A study published in the *Journal of Experimental Biology* suggests a plateau has been reached in Thoroughbred racehorse performance, said Palmer. "Racing speeds have not increased significantly in Thoroughbred racing in the last 40-60 years," he said. "This study says the predictive maximum racing speed of Thoroughbreds is only about 0.5-1% faster than current racing records in Triple Crown races. This study concluded that there is a natural upper speed limit, and Thoroughbreds have been running pretty close to it for the last few decades."

### Early exercise and joint problems

Some researchers have shown exercising foals early in life is good for soundness and others have found it is harmful. Researchers in this study, published in *Equine Veterinary Journal (EVJ)*, stated currently there is no clear consensus as to whether young horses benefit from or are harmed by exercise regimes that are more rigorous than free movement and play. However, the authors did find an apparent association with animal size and the severity of joint damage due to exercise. There are physical limitations to the ability of horses' limbs to increase in size proportional to increases in the

upper body mass. In that way, anatomical properties of the horse define, to some degree, the prevalence and severity of joint injury.

"Well-controlled prospective studies in horses are still needed to determine optimum training," Palmer commented. "Since the horse appears to be a good experimental model for humans, the results of those studies will have important implications for research into the effect of early athletic training upon children."

### Hock osteoarthritis—diagnosis and prognosis

Palmer noted, "Although many sound horses have radiographic changes of the hock consistent with osteoarthritis of the small tarsal (lower hock) joints, a diagnosis of 'bone spavin' is often made on the basis of radiographic (X-ray) evaluation alone." Researchers on an *EVJ* study found there is no relationship between severity of clinical presentation, duration of lameness, response to diagnostic anesthesia (nerve blocks), and clinical outcome between mild or severe osteoarthritis in the small tarsal joints. However, horses with milder joint pathology (as seen on radiographs) tend to do better following treatment.

The study's authors concluded that although the response to intra-articular anesthesia remains the gold standard for diagnosis of small tarsal joint osteoarthritis, it remains difficult to predict which horses are likely to improve following treatment.

### Joint medications

In a study published in the *American Journal of Veterinary Research (AJVR)*, experimentally induced joint inflammation was treated with mepivacaine hydrochloride, triamcinolone acetonide, or both. Researchers found mepivacaine eliminated lameness quickly and did not compromise the effect of triamcinolone acetonide, which acted as a potent anti-inflammatory agent.

Another *AJVR* study found that when using a carpal chip model to induce arthritis, neither polysulfated glycosaminoglycan (PSGAG) or hyaluronic acid (HA) improved clinical signs (lameness). However, both had disease-modifying effects, meaning they improved the

health of the synovial membrane (joint lining) and the cartilage within it.

"The best treatment plan for osteoarthritis should include both a disease-modifying medication (such as HA or PSGAG) and a symptom-modifying medication (such as phenylbutazone, or Bute)," Palmer said.

The last joint medication study Palmer discussed evaluated topical diclofenac cream (Surpass) applied to knees with experimentally induced osteoarthritis in comparison with oral phenylbutazone. He reported that diclofenac cream (7.3 grams applied twice daily) had both symptom-modifying and disease-modifying effects, while phenylbutazone (2 grams given orally once daily) had only symptom-modifying effects (it decreased inflammation but did not improve the health of the joint).

Full study references for lameness topics discussed in the Kester News Hour can be found at [TheHorse.com/15794](http://TheHorse.com/15794).

## Reproduction

### Double ovulations, hemorrhagic anovulatory follicles

A *Journal of Equine Veterinary Science (JEVS)* study found mares were more likely to have double ovulations after receiving prostaglandin (PGF<sub>2</sub>-alpha), which is often used to manage a mare's estrous cycle. Seventeen percent of treated mares had double ovulations compared to 3% of control mares; also, 13% of treated mares vs. only 3% of controls had one ovulatory and one hemorrhagic anovulatory follicle. (HAF grows and fills with blood, but does not release an egg, thus resulting in infertility for that cycle unless another follicle ovulates normally.)

Researchers on another study (from *Theriogenology*) investigated the incidence of HAF formation in mares given either cloprostenol (another form of prostaglandin) or human chorionic gonadotropin (hCG, also commonly used to manage estrous cycles), or both. They showed mares treated with cloprostenol had a slightly higher risk of HAF (8%) than mares given hCG.

"Practitioners should be aware of potential ramifications for development of twins or hemorrhagic anovulatory follicles when using prostaglandin, particularly in mares that have had HAF previously," commented Macpherson.

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### **hCG antibodies and dosage levels**

Macpherson discussed two studies on hCG. In the first, from *Reproduction of Domestic Animals*, researchers studied mares that had antibodies against hCG and mares that didn't. Mares with antibody-positive follicles had lower blood flow to the follicular wall, fewer mature oocytes, and no hCG detectable in the bloodstream 30 hours after administration (mares without antibodies still had high levels at 30 hours).

Antibodies might have neutralized the hCG and affected ovarian function, said Macpherson. "We may need hCG protocols that stimulate lower antibody formation; this may be of particular relevance for assisted reproductive techniques such as oocyte retrieval," she said.


Scientists on a study examining hCG dosage levels found a low dose (750 IU) was as effective as a high one (1500 IU) at stimulating ovulation within 48 hours, and it was also the same in terms of number of multiple ovulations and pregnancy rate.

"A lower dose is as effective at inducing ovulation...and might have the added benefit of inciting a smaller antibody reaction," commented Macpherson.

### **Pregnancy location**

The location of a pregnancy (i.e., in the left or right uterine horn) clearly influences the next pregnancy's location. In a *Theriogenology* study scientists found that in nearly 1,400 mares, 79% of pregnancies occurred in the horn that did not house the fetus the previous season. The number of pregnancies in the previously gravid horn (where the previous fetus was implanted) increased with mare age and time between foaling and conception. Macpherson said there was a higher incidence of early embryonic death (17% vs. 5%) when the embryo implanted in the previously gravid horn.

"Particularly in older mares, we may want to skip a cycle between foaling and breeding or even consider skipping a year," she said. "Alternatively, embryo collection and transfer to a surrogate may be a good option for early breeding in these mares."

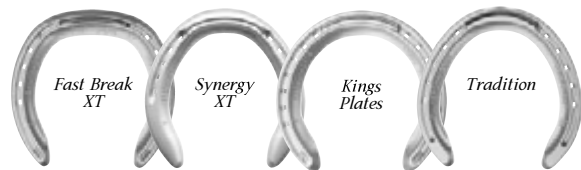
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