By Christy West

# AAEP Focus on Horse Health News

Every year veterinarians flock to the Kester News Hour at the American Association of Equine Practitioners' Convention for reports on research that are too brief or too new to be included in the scientific program. For the past two years the session has been anchored by Dr. Scott Palmer of the New Jersey Equine Clinic and a past president of the AAEP (presenting on lameness/surgery); Dr. Margo Macpherson of the University of Florida (presenting on reproduction); and Dr. Bonnie Rush of Kansas State University (presenting on medicine). Following are synopses of some of the studies discussed during the fast-paced news broadcast, held Dec. 7, 2008, in San Diego, Calif.

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**Left to right, Drs. Margo Macpherson, Scott Palmer, and Bonnie Rush anchor the Kester News Hour, covering news that's too brief or too new to be included in the scientific program**

## Medicine

***Multinodular pulmonary fibrosis —*** Rush reported that this disease, which causes a restrictive breathing pattern, weight loss, fever, cough, tachycardia (fast heart rate), tachypnea (fast respiratory rate), and poor body condition, was first reported 20 years ago. It strikes horses of all ages, and chest radiographs show nodules (white areas) in an interstitial pattern (overall loss of detail in the lung due to an increase of fibrous tissue). The prognosis is poor.

The disease appears radiographically similar to fungal pneumonia, but the history often helps separate these diseases (fungal pneumonia usually follows severe gastrointestinal disease), she noted. One paper found equine herpesvirus (EHV)-5 in 79% of affected horses via bronchoalveolar lavage or lung biopsy, compared to 8.7% of unaffected horses. "There's a strong relationship between EHV-5 and fibrosis; it seems to be the most important cause and it's an additional target for treatment," said Rush.

***Lawsonia intracellularis —*** Rush reviewed two studies on this organism, which causes a proliferative ileitis (an intestinal disease) in horses and swine worldwide. The first study followed 57 affected horses between two and eight months of age. They showed ventral (lower belly) edema (fluid swelling, in 81% of horses) and hypoalbuminemia (low levels of albumin protein in the blood, 100% of horses), with other intestinal signs such as colic, fever, lethargy, and diarrhea to a lesser degree. The disease appeared seasonally, with these horses presenting for examination between August and January (half in November and December). A thickened small intestine (seen on ultrasound examination of the abdomen) was not present in all cases, but this finding is suggestive of the disease.

Only half of the horses tested positive for *L. intracellularis* on both PCR (polymerase chain reaction) and IPMA (immunoperoxidase monolayer assay) tests; the rest were positive on one or the other. Survival rate was good (93%) with antibiotic treatment (primarily oxytetracycline), but the disease did have some lasting effects; 14 affected Thoroughbred foals sold for 68% less than siblings by the same sire, presumably due to a negative impact on growth and development.

The second study found that the incidence of the disease is relatively low despite relatively high exposure. Of 102 healthy horses on farms with *L. intracellularis* cases, 32.3% had antibodies to the disease (seropositive, indicating exposure). None tested positive via PCR, and none had hypoproteinemia (low protein in the blood).

"Seropositivity can occur without clinical signs of infection and should not be used for definitive diagnosis by itself," Rush commented. She said the author of the second study would also be presenting a study on *L. intracellularis* later in the meeting.

***EPM prevention —*** Rush discussed a study in which 20 unexposed horses were inoculated with *Sarcocystis neurona*, the parasite that causes equine protozoal myeloencephalitis (EPM). Some were then treated with ponazuril at four times the recommended dose every seven days (starting on Day 5) or every 14 days (starting on Day 12). The first dosage regimen prevented invasion of *S. neurona* into the cerebrospinal fluid in three of five horses, while the second was ineffective in all horses. No horses developed ataxia (incoordination) or other clinical signs of the disease, even if untreated.


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"We need a better model for recreating this disease experimentally," she noted. "Nonetheless, using the best model we have available today, ponazuril given at this dose every seven days to horses with known high exposure may prevent EPM."

***Heart murmurs in racehorses —*** Heart murmurs are not necessarily a problem in athletic horses, according to a study of 526 Thoroughbred racehorses (flat racers and steeplechasers) in the United Kingdom. Rush reported the more fit the horse, the more likely he is to have a murmur. Murmurs can be a functional adaption to athleticism, as opposed to the result of a structural cardiac abnormality.

"In this population, 22% of the horses had murmurs, including 43% of the National Hunt horses (steeplechasers)," she said. "But even when separating out horses with loud and apparently clinically relevant murmurs (ones you can feel with your hands)—there was still no negative impact on performance." These findings do not indicate that every murmur in an athletic horse should be dismissed; however, the presence of a murmur does not necessarily indicate a structural cardiac problem.

## Surgery/Lameness

***Biomarkers for lameness diagnosis —*** Palmer discussed three studies on biomarkers (substances that indicate certain biological states) in joint fluid and their possible uses.

- The first study found while some biomarkers increase in response to exercise, others increase with arthritis (studied with a surgically created carpal or knee chip model). "We can use this information to diagnose arthritis in horses that are exercising," Palmer explained.
- The second study found that treating horses with phenylbutazone didn't significantly affect serum biomarker levels.
- The third found that biomarkers of bone metabolism decreased as foals aged, but the decrease was more pronounced in foals born late (after March 31) than in early foals. In this study, biomarkers were not helpful to diagnose osteochondrosis in young foals.

"This is exciting new technology, but it's not quite ready for prime time yet," he commented.

***Tendon/ligament repair —*** "The names have changed since last year. What we once referred to as stem cells, we now call nucleated cell fractions," said Palmer. He discussed a study from Cornell University that found that injection of adipose (fat)-derived nucleated cell fractions improved fiber organization in repaired tendons ("architecturally better healing").

Another study evaluated platelet-rich plasma used to treat mid-body suspensory ligament injuries in nine Standardbred racehorses via a single injection followed by a controlled exercise program. All nine returned to racing after about 32 weeks, with at least six starts thereafter (five were still racing three years later). "Although many Standardbred racehorses can race with suspensory ligament injury, these horses had moderate to severe trauma and did pretty well with this treatment," Palmer commented.

***Airway problems —*** Palmer discussed four studies that described surgical techniques used to treat partial upper airway obstruction in performance horses.

- One study of Thoroughbred and Standardbred racehorses found that horses with soft-palate displacement treated with a laryngeal tie-forward (where the voice box is moved up and forward within the throatlatch area) were just as likely to race afterward as untreated horses. Their earnings, which were below average before treatment, increased to baseline levels after surgery.

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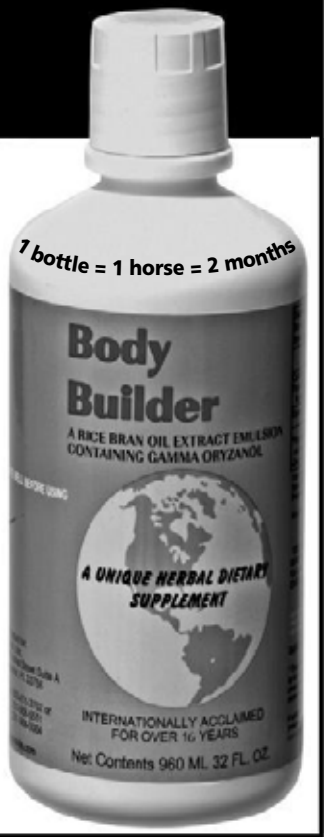


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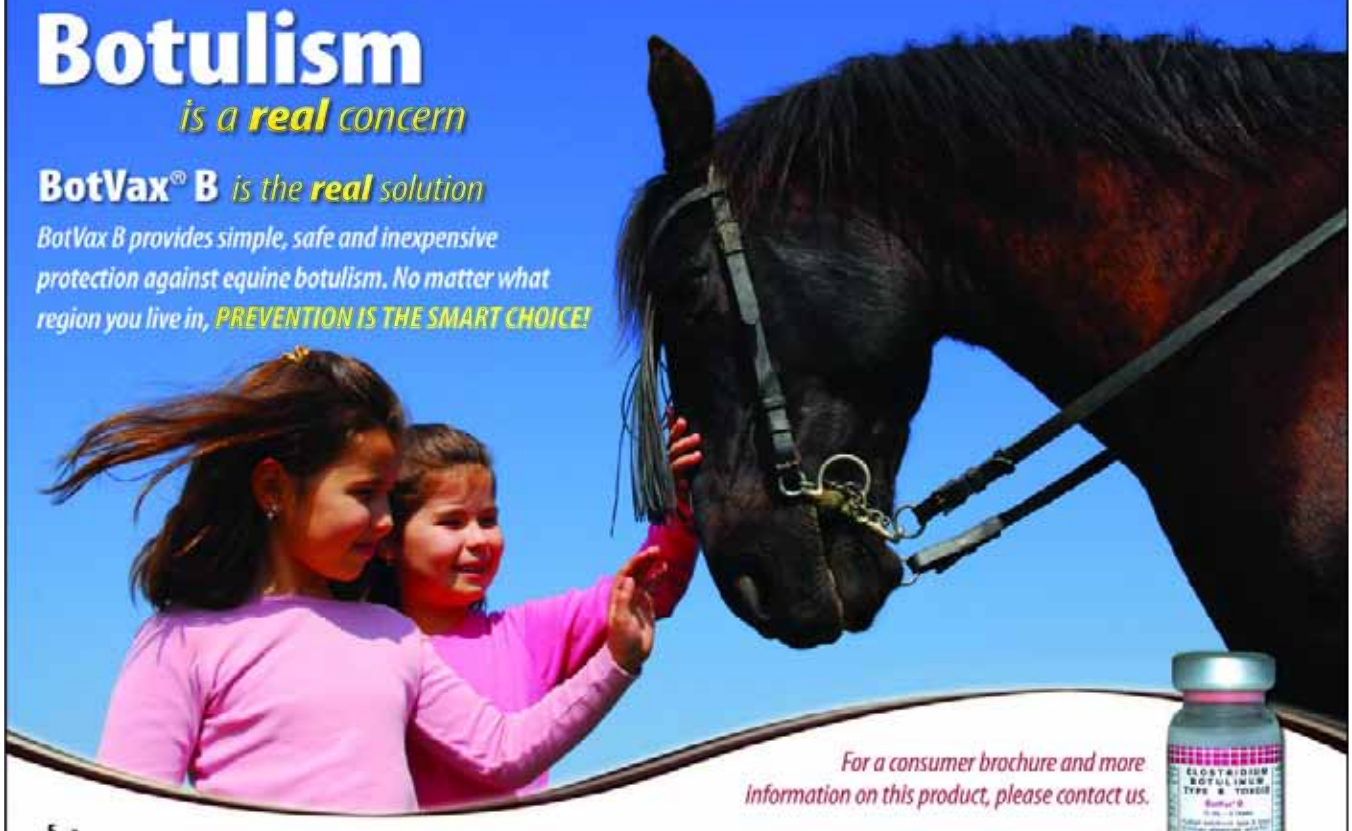

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- The second study found that horses with soft-palate displacement treated with a combination of tenectomy of the strap muscles attaching to the voice box and soft-palate surgery experienced improved performance and earnings postoperatively.
- A third study evaluated partial arytenoidectomy (removal of dysfunctional or diseased voice box cartilage) followed by closure of the mucosal incision. When this procedure was performed on 76 Thoroughbred racehorses, 82% raced after about six months and 63% raced at least five times. "So a Thoroughbred racehorse treated with partial arytenoidectomy with mucosal closure is likely to race after this procedure and to return to his previous performance level," said Palmer.
- The last airway study Palmer discussed found that sedation with either detomidine or acepromazine for endoscopic airway examination reduced a horse's ability to abduct the left arytenoid cartilage fully (move it out of the airway). Thus, "Sedation should be avoided whenever possible when evaluating a horse for normal laryngeal function to achieve a more accurate diagnosis," advised Palmer. This advantage, however, should always be weighed against the safety of either the horse or the examiner and handler.

***Pain management —*** Palmer described two studies comparing pain management strategies. The first study evaluated the use of nonsteroidal anti-inflammatory drugs by comparing phenylbutazone (Bute) given alone or in combination with flunixin meglumine (Banamine) for treatment of lameness. That study found the combination improved lameness scores more than treatment with Bute alone. However, lameness was not always completely eliminated even with the combination, and lameness did not improve at all in some cases. Additionally, one horse died of acute necrotizing colitis following administration of the combination. This paper provides additional evidence that combined use of multiple NSAIDs to treat lameness in the horse is not always successful and can have fatal complications.

"The (lameness improvement) results may attract people to use this combination to increase performance, but we must consider the potentially life-threatening toxic adverse events," said Palmer.

The second study compared oral paste firocoxib (Equioxx) to Bute and found the two medications improved lameness to the same degree. "The firocoxib-treated horses had less pain on joint manipulation and palpation, decreased joint circumference (less swelling), and improved range of motion, but the same lameness scores," said Palmer. "There was also no significant difference in the rate of adverse events. They're fairly equivalent drugs."

***Joint medication —*** Several studies that looked at innovations in intra-articular (within a joint) therapy were discussed. Palmer discussed one that investigated movement of corticosteroids between the coffin joint and the navicular bursa (a fluid-filled cushioning sac between the navicular bone and the deep digital flexor tendon). The study of 32 healthy horses found that when either location was medicated, clinically significant concentrations of the medication were found in the other structure. So clinicians are justified in injecting the coffin joint to treat navicular bursitis. "This approach is much easier and safer for the horse," explained Palmer.

A laboratory study found that a commonly injected corticosteroid (triamcinolone acetonide) had protective effects on equine cartilage similar to those found with sodium hyaluronate injection. "In vivo (in live horses) studies are needed to demonstrate the clinical impact of these findings," Palmer noted.

Lastly, a study performed on calves found that doxycycline (an antibiotic) injected intra-articularly caused no damage and even exerted a short-term chondroprotective (cartilage-protecting) effect. For this reason, "Doxycycline might have a potential use for treating septic arthritis (infection in a joint) in foals," noted Palmer. "However, since doxycycline isn't a broad-spectrum antibiotic, it would not be a good choice unless the causative organisms are found to be sensitive to it."

***Surgical techniques —*** When a horse needs an eye removed, you don't have to knock him out to do it. That was the message of one study, which found that the procedure can be done in standing horses with proper local/regional anesthesia. "There were no long-term complications of doing the procedure standing; this

approach reduces cost and eliminates the risks of general anesthesia," commented Palmer.

The second study evaluated the risks and outcomes of rectal tears, which were most common in Arabian and miniature horse breeds, mares, and horses older than 9 years (and tended to be larger following dystocia). Tears are graded according to which tissue layers are torn. Grade 4 tears are the most severe, with tearing of all tissue layers and potential escape of feces into the abdomen. Grade 1 and 2 tears had 100% survival regardless of surgical technique used to repair them while grades 3 and 4 had poorer success rates (38% and 2%, respectively).

Another study on rectal tears, specifically surgical repair in mares after parturition (delivery), found that four of six mares survived postpartum surgical repair of the rectal tear (two died of unrelated causes). "This study showed that in spite of the serious nature of this type of injury, rectal tears as a result of parturition can be repaired successfully with (the appropriate) surgical technique," commented Palmer.

Lastly, Palmer discussed a study that found injection of corticosteroids into the fibrous lining of subchondral (beneath the joint cartilage) cystic lesions in the stifle joint was an effective treatment for 67% of the 52 reviewed cases. He noted that treatment success rates varied with the surgeon and that the procedure was more effective for cases with cysts in one limb vs. both hind limbs and in horses without pre-existing arthritic changes in the joint. Horses generally returned to training within three months.

"This procedure is easier than debridement (cutting out the lesion) and has similar results," he noted.

## Reproduction

***Controlling estrous behavior —*** "Owners frequently ask us for techniques for suppressing estrus in performance animals," said Macpherson. She discussed a Finnish study on the use of polypropylene balls placed in the uterus within four days after ovulation to simulate an equine conceptus, similar to the glass marble concept *The Blood-Horse*'s sister publication, *The Horse*, has previously reported (See article #4189 at TheHorse.com for more information). The technique resulted in "surprisingly prolonged diestrus" (staying out of heat); 75% of the studied mares stayed out of heat for an average of 57 days, compared to only an average of 16 days for control (untreated) mares. The balls had limited movement throughout the uterus and caused no uterine damage.

"They were very effective for reducing estrous behavior," Macpherson said.



Another study used oxytocin injections (twice per day for a week, starting a week after ovulation) to achieve the same goal. All six treated mares stayed out of heat for at least 30 days. A third study evaluated a long-acting synthetic progestin (medroxyprogesterone acetate) injected intramuscularly on a weekly basis for five weeks following an initial loading dose, comparing it with a daily administration of altrenogest (Regu-Mate). The researchers found that the synthetic progestin was not effective for controlling estrous behavior while treatment with Regu-Mate was.

***Foaling problems —*** Uterine tears incurred during foaling are usually considered surgical cases, but Macpherson reported that one study showed similar survival rates for mares treated only medically (73%) and mares treated surgically (76%). There was no significant difference in treatment cost or duration of hospital stay. Future reproduction was not significantly impaired for medically managed mares in the same season; however, long-term effects on reproduction were unknown.

"This rocked my world; I always thought this was a surgical disease," Macpherson said.

Another possible foaling complication is traumatic ventral (lower belly) herniation in foals after dystocia (difficult birth). Macpherson reported two of four affected Thoroughbred foals in one study survived following surgical repair; the other two were euthanized. "Use only moderate traction to assist a dystocia case, and pull in concert with the mare's contractions in a downward arc so you're not fighting against the mare's anatomy," she recommended.

***Late-term broodmare concerns —*** "Generally, we like to forget about late pregnant mares and put them on the back burner until they foal, but they can have some pretty significant issues," said Macpherson. She discussed a study of body wall tears (such as hernias and prepubic tendon ruptures) that found conservative management (such as pain relief and fluids) was just as effective as interventional management (such as Cesarean section or early induction of parturition/delivery) at saving the life of the mare. Foal survival was better with conservative management (seven of eight mares survived and delivered healthy foals vs. no live foals in the interventional treatment group).

"Give the mares a shot!" advised Macpherson. "They can survive and deliver viable foals."

Uterine torsion (twisting) was the focus of another study, which found that surgical correction of the torsion showed good survivability of both mares and foals. The technique involved "floating" the uterus with 20 liters of sterile saline to make manipulation of the uterus easier, and it had a "good success rate" (successful correction in 17/19 mares). Thirteen delivered live foals, and five had wound complications (at the incision).

Sometimes it is helpful to induce parturition in a later-term mare. Low-dose oxytocin (3.5 IU) was found to be effective for this in one study, with 69% of 148 mares responding within 20 minutes. It took more than two hours for the rest to respond. All foals were normal.

"Some may slip through the cracks and foal later, so keep watching them," said Macpherson. "It's an effective method, but mares have to be ready to foal to respond to this microdose."

***Stallion self-mutilation —*** "This is not an overly prevalent disease, but it can have catastrophic consequences," said Macpherson. The study (by *The Horse*'s behavior columnist Dr. Sue McDonnell, TheHorse.com/Departments/Default.aspx?ID=15) found that stallion self-mutilation occurs in about 2% of stallions and pain is the most common cause (such as from enteroliths, TheHorse.com/TopicSearch/Default.aspx?ID=124&nID=7&n=Enteroliths; uroliths; or any problem in the reproductive tract). This is the most common of the three types of self-mutilation, and it's seen in mares, too; behavior includes circling, lunging, and biting or kicking at the flanks that can result in substantial damage.

Type 2 is only seen in males and describes self-directed inter-male aggression (even in herd situations) such as a stallion marking his own fecal pile or becoming aggressive to his own odor on objects. Type 3 is the least common and describes a quiet, mutilative stereotypic (rhythmic and repetitive) behavior that tends to happen at the same time of day in the same location.

"How do we treat these animals? The most important thing is to remove the underlying cause, which might require exhaustive examination," said Macpherson. Restraints are not recommended, although rubber grazing muzzles might help prevent self-damage. Social, feeding, and work changes are recommended. More information can be found on this topic (www3.vet.upenn.edu/labs/euinebehavior/FAQ/selfmutilate.htm).

***Twin reduction —*** Macpherson discussed a study of two methods for euthanizing a twin after it has become stationary in the


uterus (when discovered earlier, one twin is usually manually crushed since twinning poses a health risk to both of the fetuses and to the mare). The study found that 57% of the remaining embryos survived at least 10 days after ultrasound-guided reduction of one embryo. Increased mare age, number of previous foals, and length of gestation all resulted in decreased success rates with either procedure. "Both procedures require experienced hands for success," noted Macpherson.

***Equine viral arteritis (EVA) in pregnant mares —*** Macpherson discussed a small study of five late-gestation mares that were accidentally given a modified-live EVA vaccine seven to 13 weeks prior to foaling. All mares remained healthy and so did the foals (which showed antibodies to EVA after nursing). Another study still in progress found that three of 19 vaccinated mares aborted (one factor might have been stress from a diarrhea outbreak on the farm). "Be cautious how you use this vaccine," advised Macpherson. "The AAEP guidelines (www.aaep.org/eva.htm) on this should be adhered to closely."

***Stallion fertility —*** "This was a big year for developments in stallion reproduction," Macpherson commented, leading into a discussion of four studies.

One study comparing three "nonspermicidal" lubricants found that all but one (Pre~SeedEQ) significantly decreased sperm motility at 24 and 48 hours of storage. "Motility isn't necessarily the best indicator of fertility, so use caution in interpreting this information," said Macpherson.

Another study comparing two semen cryopreservation protocols for eight stallions found that the most effective approach was to use lactose EDTA cryopreservation extender with a pre-cooling period (which is different than package instructions).

Cushioned centrifugation of semen resulted in high sperm recovery rates and satisfactory sperm function in another study. Conical-bottom tubes resulted in slightly more sperm recovered, but newer nipple-bottom tubes resulted in higher values for motility. Lastly, motility was better with an opaque extender than with a clear one. "This information may be helpful when processing dilute ejaculates," noted Macpherson.

Three studies on density gradient centrifugation of semen using silane-coated silica particles (EquiPure) was found to result in improved motility and viability compared to centrifuging without this product, resulting in improved fertility of select cases.


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# HealthWatch

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### WINDPUFFS

Windpuffs are soft, fluid-filled swellings toward the back of the fetlock joint, resulting from inflamed deep digital flexor tendon sheaths, writes Heather Smith Thomas in the March issue of *The Horse*.

Commonly, these puffy enlargements are symptomless blemishes. In some instances, however, the horse might be lame from recent injury to the tendon sheath, with marked heat and pain in the area when you flex the joint or palpate the swelling.

Dr. Tim Lynch of Peterson & Smith Equine Hospital in Ocala, Fla., says many horses have windpuffs, especially in the rear legs, with no associated lameness.

"The swellings occur where the digital flexor tendon sheath covers the two tendons that go around the back of the fetlock," said Lynch. "This sheath has a synovial lining, just like a joint."

Tendons are always lubricated to prevent friction that might interfere with smooth movement. Wherever a tendon runs across a joint, the tendon is encased in a hoselike sheath that contains a small amount of lubricating fluid. Swelling in this area generally means the sheath or the structures within it have been stretched or injured, creating extra fluid. This causes the sheath to bulge like a balloon.

"The key to whether windpuffs are a problem is whether they are symmetrical," said Dr. Gary Baxter of Colorado State University. "If they are symmetrical, I am usually not concerned. But if one is much larger (in one leg compared to the others), this usually indicates a problem, such as acute injury in that leg."

If there's excess fluid in the sheath due to acute injury or scar tissue and it's causing discomfort, the horse might need treatment. With an acute injury the first step is resting the horse and using ice or bandaging, just as you'd do for a human with a sprained ankle or a muscle injury.

"The most likely scenario is hyperextension of the fetlock joint, pulling the tendons, or a twist or sprain of structures around the tendon sheath," said Baxter. "Along with cold therapy and wrapping, you could use a topical anti-inflammatory medication such as Surpass."

If the problem doesnt respond to rest and wrapping, you can inject windpuffs with steroids and hyaluronic acid, similar to how you'd inject a joint.

If your horse has chronic windpuffs, watch them for changes in size and symmetry among the affected legs, and observe whether your horse is uncomfortable. Discomfort and/or heat and swelling could be a sign of acute injury, so call your veterinarian in these scenarios. Effective treatments, from HA injections to annular ligament transection, are available.

### FRACTURE REPAIR

Researchers at the University of Wisconsin-Madison have reported that delivering a growth factor in a dissolvable carrier at a bony fracture site results in accelerated healing when compared to untreated fractures, and it is as effective as post-fracture bone grafts, writes Dr. Stacey Oke in the March issue of *The Horse*.

The growth factor in this study, recombinant human bone morphogenetic protein-2 (rhBMP-2), is known to initiate bone formation. When combined with a carrier such as calcium phosphate, rhBMP-2 delivered directly to the fracture site can maintain sufficiently high concentrations for a long enough period to signal migration and multiplication of bone-forming cells.

University of Wisconsin-Madison scientists studied effects of rhBMP-2 on bone fracture healing in either the second or fourth metatarsal bones (splint bones in the hind limb), treating the bones with an rhBMP-2 injection, an autogenous bone graft from the horse's own tibia, or leaving them untreated (control).

After 12 weeks, healing rates in the rhBMP-2 group were superior to the controls, and the repairs were as good or better than in the bone graft group. Vets assessed success via X rays, mechanical testing, and histology (microscopically). ■

*Excerpted from* The Horse: Your Guide to Equine Health Care. Free weekly newsletters at *www.TheHorse.com*

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