CENTER FOR EQUINE HEALTH

HorseReport

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Special Issue
Joint Health

UCDAVIS
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Center for Equine Health

DIRECTOR'S Message

Horses regularly showcase their athleticism in a variety of disciplines and these efforts place demands on their bodies. In particular, their joints work overtime to perform canter pirouettes, trek over challenging terrain, slide to a stop, jump into water, and accomplish all of the other feats they tackle.

Joint health is an expansive topic, but comprehensively addressing the health of our equine athletes demands that we try to unravel some of the complexity behind why joints behave the way they do and how to keep them performing their best for as long as possible. On one hand, advances in recent years have produced an array of potential treatments that go beyond traditional corticosteroid injections, which are still the most commonly administered joint therapeutics. On the other, there are so many individual variables that influence joint health and disease that research is challenging and solid conclusions remain frustratingly elusive.

In this issue of the *Horse Report*, we pull at some of the threads to try to unravel the often conflicting data, sometimes overstated marketing claims, and new technologies that have promise but lack proof. We are grateful to Drs. Sarah le Jeune and Scott Katzman for sharing their expertise and extensive experience on everything from regenerative therapies to joint supplements and more. We hope this issue serves as an outline to help navigate new claims and discoveries in this area as they arise and provide some clarity on how to choose the right approaches for your horses.

As always, it is important to work closely with your veterinarian as timely diagnosis and appropriate treatment are essential to joint health, soundness, and longevity.

Carrie J. Finno, DVM, Ph.D., Diplomate ACVIM
CEH Director

Thanks to Our Collaborators

Dr. Sarah le Jeune is the chief of the Equine Integrative Sports Medicine Service at the UC Davis veterinary hospital. Board-certified in Equine Surgery and Equine Sports Medicine and Rehabilitation, as well as certified in veterinary acupuncture and chiropractic, her research interests include general surgery and equine integrative sports medicine.

Dr. Scott Katzman is the chief of the Equine Surgery and Lameness Service at the UC Davis veterinary hospital. A diplomate of the American College of Veterinary Surgeons, his research focuses on diagnosis and treatment of soft tissue and musculoskeletal abnormalities in horses, management of dynamic upper respiratory obstruction, and minimally invasive surgery.

Dr. Sarah le Jeune

Dr. Scott Katzman

Sarah Shaffer Receives **2021 WILSON AWARD**

Shaffer and her horse, Beau.

Sarah Shaffer received the 2021 James M. Wilson Award, which recognizes a graduate student or resident who significantly advances equine health through publication of the year's most outstanding research report. Shaffer, a Ph.D. candidate in mechanical engineering, was chosen for her publication entitled, "Subchondral focal osteopenia associated with proximal sesamoid bone fracture in Thoroughbred racehorses," published in the Equine Veterinary Journal. Her research was conducted at the J.D. Wheat Veterinary Orthopedics Research Laboratory under the direction of Dr. Susan Stover.

The most common cause of fatal injury among California Thoroughbred racehorses is proximal sesamoid bone (PSB) fracture. The PSBs are a pair of bones in the suspensory apparatus that support the back of the fetlock joint. When they fracture, the fetlock loses support and the horse cannot bear weight on the limb. These fractures are related to stress fractures and occur because the bones are unable to repair accumulated microdamage caused by repetitive high loads. Normally, damage is continually repaired by removal and replacement of damaged bone. However, when bone removal is faster than replacement, temporary bone loss can create weakness and susceptibility to fracture.

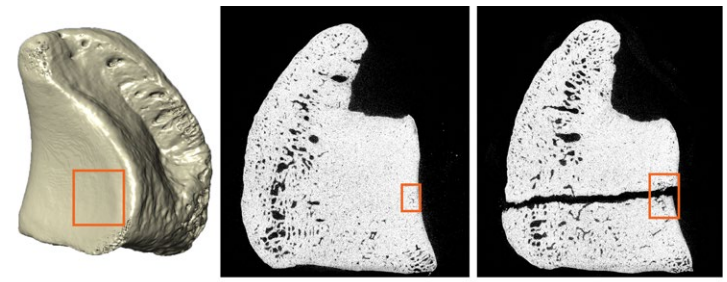
Until recently, there was no way to identify horses at risk for PSB fracture. This study discovered, characterized, and described changes that precede PSB fracture and put horses at risk for catastrophic fracture. Shaffer examined PSBs from racehorses that died due to PSB fracture during racing or training using microcomputed tomography, high-detail x-rays, tissue stains and other techniques. A bone bruise was observed below the joint surface that was not present in unaffected horses. This lesion showed a region of bone loss and evidence of high levels of microdamage.

These typical stress fracture characteristics provide guidance to veterinarians for injury prevention (via screening) and treatment. With the concurrent introduction of positron emission tomography (PET) scanning of the PSBs, the changes discovered allow affected horses to be identified and rehabilitated for return to training and competition.

"Sarah's research findings were key to developing injury prevention strategies that contributed to the 41% reduction in California racehorse fatalities over the previous year," said Stover. "Knowledge of the warning signs of imminent catastrophic fetlock injury allow for detection of affected racehorses and their rehabilitation – saving horse lives and preventing jockey injuries associated with racehorse falls."

Shaffer's work also contributed to the California Thoroughbred Foundation awarding her the 2019 Louis R. Rowan Fellowship. A lifelong equestrian, Shaffer holds a National Reining Horse Association Youth World Title and multiple top 10 placings at the American Quarter Horse Congress in reining with her Quarter Horse, Roostamatic (a.k.a. Beau). "I have enjoyed working with veterinarians, pathologists, and engineers to further our understanding of racehorse PSBs," she said. "Coming from a background where I showed reining horses at a national level, it has been especially rewarding to work on a project that helps to improve horse welfare."

Shaffer plans to work as a postdoctoral researcher at UC Davis and eventually hopes to continue in the equine biomechanics field as a professor at a research institution.



Proximal Sesamoid Bone | Case Intact PSB | Case Fractured PSB

Left) 3D reconstruction of a proximal sesamoid bone (PSB), developed from a microcomputed tomography scan. Center and Right) Images of PSBs taken with microcomputed tomography from the forelimbs of a horse with a PSB fracture. The bone lesion (inside the orange square) was seen in both the fractured PSB and the opposite forelimb's intact PSB. The lesions were not found in controls.

It All Hinges **ON THE JOINTS**

Equine athletic potential and subsequent performance, success, and longevity hinge on healthy joints. Joints are essentially where two or more bones meet, yet they allow the body to perform complicated functions. Some allow for movement, influencing range of motion, stride length and overall comfort.

There are three different types of joints:

- **Cartilaginous joints** are those in which the bones are connected by cartilage, a firm but flexible tissue made up of specialized cells called chondrocytes. They permit a limited amount of movement and include pelvic joints and joints in the vertebral column.
- **Fibrous joints** do not move and there are comparably few of them in the body. Examples include the places where the bones of the skull come together.
- **Synovial joints** enable the most movement, transfer weight (load) between bones, and are the most common joints in a horse's body. They are filled with fluid encased in a membrane and surrounded by a joint capsule. They include ball and socket joints, hinge joints, and gliding joints. Examples of synovial joints are hocks and stifles.

Since synovial joints are the most common and allow for the most movement, they are the primary type for consideration when it comes to joint health. A synovial joint can be thought of as an organ, made up of different types of tissues. Articular cartilage is present at the ends of the bones, cushioning them and acting to distribute loads and minimize friction during movement. It is composed of an organized arrangement of collagen, water, and proteoglycans (chains of sugar units called glycosaminoglycans (GAGs)). Soft tissues, such as tendons and ligaments, stabilize the joint's range of motion.

Cartilage is not well-equipped to heal itself, so it is important to think about preservation beginning at an early age to maximize soundness and performance longevity. Unfortunately, all it takes for cartilage to begin to degrade is an excessive amount of inflammation, which is often brought on by repetitive "wear and tear". Since the articular cartilage does not have its own natural blood or nerve supplies, evidence of joint injury is not immediately apparent, therefore joint problems are not always obvious when they start. Joint disease and injury, especially in performance horses, commonly lead to expensive, often time-consuming diagnostics, treatments and therapies, loss of training time, decreased performance, and even loss of use of the horse.

Osteoarthritis (OA), formerly known as degenerative joint disease, is the most common joint problem in horses, accounting for more than 60% of equine lameness. The term "arthritis" refers to joint inflammation, and there are many types and causes in horses. Osteoarthritis can occur in any synovial joint. It is a degeneration of the cartilage that can be precipitated by factors including repetitive trauma, historical fractures or other injuries, and/or poor conformation that can increase stress on joints. High-speed training is also a risk factor. Osteoarthritis gets progressively worse with age, but can affect horses of any age and breed, with males and females equally affected.

A variety of treatment options are available, but there is no single standard treatment or known cure for OA. Since there are so many factors involved, the prognosis for affected horses is extremely variable depending on the severity of the disease, single or multiple joint involvement, whether high or low motion joints are involved, historical and intended horse use (see table), as well as clinical signs of OA and how long they have been present.

The physiological processes related to joint disease are extremely complex, making treatment challenging. The multifactorial nature of the disease complicates research, and many aspects remain elusive, even in humans, where it has been more extensively studied.

Ideally, joint health should be prioritized early to avoid or minimize joint injury and disease. Management considerations, including specialized trimming and shoeing, nutrition, and appropriate exercise programs are important elements in the equation.

Table. Joints that undergo the most stress (and hence are more prone to injuries) in certain disciplines. Compiled from *Diagnosis and Lameness in the Horse*, second edition.

Discipline	Joint(s) associated with the highest levels of stress
Arabian show horse	Fetlock, hock, pastern, stifle
Arabian racing	Fetlock, hock, stifle
Barrel racing	Fetlock, hock, stifle
Cutting	Hock, stifle
Draft horses	Fetlock, pastern, stifle
Dressage	Fetlock, hock, knee, pastern
Driving	Fetlock, hock, pastern, stifle
Endurance	Fetlock, hock
Eventing	Fetlock, hock, pastern
Gaited horses	Fetlock, hock, stifle
Hunter/Jumper	Fetlock, hock, pastern, stifle
Pleasure riding	Fetlock, hock, knee, stifle
Polo	Fetlock, hock, pastern
Ponies	Fetlock, hock, stifle
Quarter Horse racing	Fetlock, hock, pastern, stifle
Reined cow horse	Fetlock, hock, pastern, stifle
Roping	Hock
Standardbred (Trotter) racing	Fetlock, hock, stifle
Thoroughbred racing	Fetlock, hock

TO **INJECT** OR NOT TO **INJECT?**

Joint (intra-articular (IA)) injections are often performed to treat joint inflammation and injury. This delivers treatment directly into the joint, ensuring the therapeutics are present where they are most needed, as opposed to systemic treatments (i.e. given intravenously, orally or intramuscularly) that have to travel through the body to the site of injury or disease.

Deciding which IA therapeutics to employ depends on multiple factors, including degree of lameness, specific joint, condition of that joint, horse's age, riding discipline, veterinarian's preferences and experiences, costs, and timelines. **Accurate diagnosis prior to treatment is essential to ensure appropriate therapeutic intervention.**

Some common IA therapies include:

Corticosteroids

If your horses receive IA injections, there's a good chance they are getting corticosteroids. They are an effective, inexpensive, first-line approach to combating joint disease. Corticosteroids, including triamcinolone acetate (TCA), methylprednisolone acetate (MPA), and betamethasone acetate, are used for their anti-inflammatory effects. However, despite their popularity, IA corticosteroid use is controversial.

Research indicates that TCA protects cartilage and MPA can reduce signs of joint inflammation, and improvements in lameness have been observed with both. However, concrete evidence regarding efficacy is lacking. Harmful effects have been reported, with some being dose-dependent, and research on repeated injections of corticosteroids has suggested deleterious effects on cartilage. Corticosteroids can move from joint spaces to surrounding soft tissues and have been shown to delay healing, so they should not be used in horses with soft tissue injury.

Case reports suggest that corticosteroid administration is a possible risk factor for laminitis, but several studies have shown little evidence of association in healthy horses. Corticosteroid use should be avoided in geriatric horses and horses with metabolic disorders (EMS and PPID, for example) who are at increased risk for complications including the development of laminitis.

Overall, many questions about IA corticosteroid use remain unanswered and further studies are required.

Hyaluronic acid/hyaluronan/hyaluronate (HA) – Naturally-occurring in synovial fluid and cartilage, HA is a viscous substance comprised of glycosaminoglycans (GAGs) that reduces friction in the joint. Concentration of HA decreases with age and inflammation makes joint fluid thinner and less protective. Injections are often used to treat inflammation, helping synovial fluid maintain a thicker, more protective

consistency. It is most effective for mild to moderate levels of osteoarthritis (OA), but has limitations for treating more severe disease.

Administration of HA in combination with corticosteroids has been suggested to improve beneficial effects and reduce side effects of corticosteroids.

Biologics/Autologous Blood Products

Platelet-rich plasma (PRP)/Autologous conditioned plasma (ACP) – A cell-based therapy, PRP is made from the patient's blood to contain a higher concentration of platelets than whole blood. Platelets are the first cells to respond to an injury. They contain growth factors and cytokines that promote healing and regulate inflammation. Platelet-rich plasma delivers high levels of growth factors and is used to treat musculoskeletal injuries and OA.

The effects of PRP on tendon and ligament injuries have been more thoroughly evaluated than its efficacy in joints. Results are promising, but strong scientific evidence to support the clinical use of PRP for joint disease is lacking. The composition of blood, including platelet concentration, varies by age, breed, and sex, which potentially influences the effects of PRP, and impacts how research studies are conducted and compared. These individual characteristics mean there are no standardizations for the preparation and application of PRP, so several methods have been described. Additional research and standardization are required to determine optimum dosing, timing and number of treatments across various injuries, tissue types, and surgical procedures.

Interleukin-1 receptor agonist protein (IRAP)/Autologous conditioned serum (ACS) – A cell-free product in which blood is incubated with specially designed glass beads to generate an enriched serum, IRAP is an anti-inflammatory that blocks interleukin-1 (IL-1), an important mediator of inflammation and joint degradation. To treat joint disease, IRAP is typically administered every seven to ten days for three to five treatments, although in cases of longer-term management of chronic joint disease, a single injection can be effective. It generally takes one day to process IRAP. Since it is a cell-free preparation, IRAP can be easily frozen and stored. It is particularly beneficial in cases of joint disease with concurrent soft tissue injury.

Stem cells – Regenerative therapies are primarily focused on cartilage regeneration by mesenchymal stem cells (MSCs). Although most studies have not demonstrated comprehensive cartilage regeneration, reduction of clinical signs and successful return to work have been reported. Outcomes and comparisons across studies and treatments are challenging as disease stage, number of cells, source of cells, culture techniques, implantation methods, and patient age and sex can significantly affect the function and efficacy of MSCs. Consequently, the ideal timing, number of cells, and recommended doses have not been established. Further studies involving stem cells in controlled models are required before this approach can be reliably employed to treat cartilage damage.

A wide variety of IA therapeutics have been evaluated in horses with joint disease, allowing for individualized approaches. Work with your veterinarian to select targeted approaches specific to your horse's needs.

Intravenous (IV) administration of HA is common, especially for less localized disorders. Only one HA product, Legend® (Bayer), is currently licensed for IV administration in horses in the U.S. Studies have reported decreased lameness in up to 90% of IV HA-treated horses.

Adequan® (American Regent Animal Health) is the only FDA-approved intramuscular (IM) polysulfated glycosaminoglycan (PSGAG) product for osteoarthritis in horses. Research has shown that the IM product can reach the joint where it may limit cartilage-degrading enzymes. Often used as a preventative measure, no scientific studies to date have investigated prophylactic use.

SUPPLEMENTING FOR JOINT HEALTH: What the Science Says

Owners are increasingly proactive about horse health, performance and longevity, which is clearly reflected in the ever-growing market for equine supplements, also known as nutraceuticals. In a 2017 survey of owners in the U.S., 84% reported giving supplements to at least one horse. Of these, 90% indicated they would use supplements to treat or prevent joint issues. Systemic therapies for joint disease are attractive because they are less invasive than intra-articular injections and thought to be conducive to long-term preventative support.

Despite the high use of supplements, there is little scientific evidence to back many products' claims. Since nutraceuticals are not regulated by the U.S. Food and Drug Administration (FDA), safety and efficacy do not have to be proven. Some states require safety studies prior to marketing, but those rules can be difficult to enforce. Consequently, some independent laboratory analyses of active ingredients revealed that many products fall short of labeled amounts.

Ingredients found in equine oral joint supplements include:

Glucosamine and chondroitin sulfate – Glucosamine and chondroitin sulfate are precursors and components of glycosaminoglycans (GAGs), respectively. They are thought to slow cartilage degradation, stimulate new cartilage, and reduce inflammation. Although several studies have been performed, most have not shown improved joint heath. Questions have been raised about low bioavailability, or ability to be absorbed into the bloodstream from the gut and make their way to the joints. Substantial variation in product quality and concentration of glucosamine and chondroitin sulfate, as well as discrepancies in dosing recommendations, make it difficult to select appropriate supplements.

Avocado/soybean unsaponifiables (ASU) – Unsaponifiables are components of a fatty substance that are insoluble in water. A mixture extracted from avocado and soybean oils has suggested benefits for treating osteoarthritis (OA) in people. A study evaluating ASUs in a model of equine OA in the knee noted no significant side effects, modest improvements in cartilage and synovial membranes, but no differences in the degree of lameness. No adverse effects have been identified, but research is required to determine bioavailability and effective doses.

Resveratrol – Found in plants such as red grapes and blueberries, resveratrol is thought to have anti-oxidative and anti-inflammatory properties. A randomized clinical trial

reported reduced hock lameness in horses with naturally occurring OA that were administered oral resveratrol (Equithrive) after IA triamcinolone hock injection compared with controls that received injection, followed by an oral placebo. This suggested that resveratrol may be a useful adjunct therapy in horses with OA and a good alternative to nonsteroidal anti-inflammatory drugs (NSAIDs). Another study showed no changes in measures of inflammation after three weeks of supplementation. A study of equine cartilage cells suggested that the compound may have chondroprotective effects, but noted dosing should be carefully controlled, as increased doses showed pro-inflammatory, and even cytotoxic, effects.

Methylsulfonylmethane (MSM) – An anti-inflammatory known to decrease joint pain and swelling in people with OA, MSM is a form of sulfur, an important component of GAGs. It is derived from dimethylsulfoxide (DMSO), commonly used in horses to combat inflammation. Found in fruit, alfalfa, and corn, MSM is often fed with glucosamine. Research on the efficacy of MSM for equine joint health is sparse, and available data is generally from combination products. One study reported that the use of a glucosamine/CS/MSM supplement had no effect on stiff gait in geriatric horses. Although no side effects have been observed, MSM should be used under veterinary supervision in horses with blood clotting disorders, hyperglycemia, shellfish allergies, or a history of urinary tract stones.

Herbs – Herbs such as Devil's claw (*Harpagophytum procumbens*), garlic, Indian frankincense (*Boswellia serrata*), and yucca are increasingly popular for treating inflammation. However, most of these have not been scientifically tested in

horses, and not much is known regarding safe, effective doses. It is important to note that some herbs can adversely interact with other dietary components or medications, so caution is required. Additionally, some herbal ingredients, such as Devil's claw, are subject to competition regulations, so it is important to adhere to withdrawal times.

Fatty acids – Polyunsaturated fatty acids (PUFAs), found in fish and plants, are proposed to have anti-inflammatory and anti-oxidative effects. Potential roles for marine-derived omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been investigated. However, data is minimal, and often conflicting, regarding the benefit of PUFA supplementation in horses with OA. After supplementation with EPA and DHA or flaxseed-derived fatty acids for 90 days, horses in one study did not show any changes in synovial fluid composition or pro-inflammatory compounds in the knee. Another study of supplementation for 75 days indicated horses exhibited longer stride lengths, but did not identify any changes in lameness.

Choosing an Oral Joint Supplement

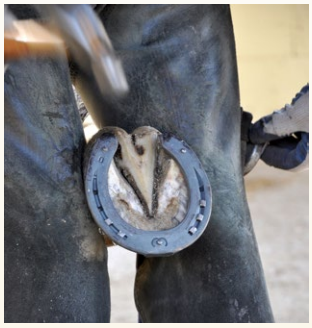
Navigating equine oral joint supplements can be frustrating and challenging. Here are a few questions to help choose the right product(s) for your horse.

- Is the manufacturer an established, well-recognized company likely to produce high-quality, effective products?
- Has the product been evaluated in published, peer-reviewed clinical trials (i.e. independent studies performed by experts and reviewed by other experts)?
- Are all ingredients, including fillers, clearly indicated on the label?
- Are label claims realistic based on available study results, not just anecdotes and testimonials?
- Are instructions for dosing accurate and easy to follow?
- Is there a lot number or other identifier for tracking surveillance?
- Is customer service information easily accessible for questions or concerns?

10 THINGS
You Might Not Know About Equine Joint Health

Joint health can be a confusing topic. We collaborated with Dr. Sarah le Jeune of the UC Davis Equine Integrative Sports Medicine and Equine Surgery and Lameness Services and Scott Katzman of the Equine Surgery and Lameness Service to provide some clarity.

1 **Joint health should be prioritized throughout a horse's career.** Although conformation, genetics, and pre-existing conditions can predispose a horse to osteoarthritis (OA), professional hoof trimming, proper nutrition, appropriate exercise, and weight management promote long-term joint health and performance. It may not be possible to avoid the development of OA as a horse ages, but early diagnosis and appropriate management can minimize joint injury and allow for early intervention.



2 **Decreasing body weight reduces joint stress.** Obesity is a significant health concern, projected to affect 30% of horses. Excess weight causes joints to experience increased weight-bearing and is a risk factor for OA. In other species, obesity is related to inflammation and risk of orthopedic disease. A loss of one pound of body weight in humans is equated to a four-pound force decrease on the knee. An 11-18% decrease in body weight in dogs with OA reduced lameness. Horses should be kept at a body condition score of 4-5 out of 9 to limit joint stress.

3 **Regular, consistent exercise is good for joint health.** Joints automatically adjust to preserve normal function and keep environmental changes within narrow limits (homeostasis). Disturbances can lead to disorders such as OA. Studies show the intensity and duration of exercise play important roles in joint health. Within a certain window, exercise is beneficial. Outside that window, mechanisms to maintain joint homeostasis become strained. Regular exercise at the canter, for example, is beneficial for joint health, whereas prolonged training at high speeds can lead to joint injury. Depending on the horse's individual jumping technique, the loads on the limbs can be similar to canter when jumping low jumps.

4 **Joint injections can be administered at regular intervals, but once may be enough.** A single injection may be sufficient to break the inflammatory cycle and long-term management factors can help keep inflammation down. However, joint disease is progressive, so some horses benefit from injections at regular intervals. Work with your veterinarian to determine an accurate diagnosis and individualized plan.

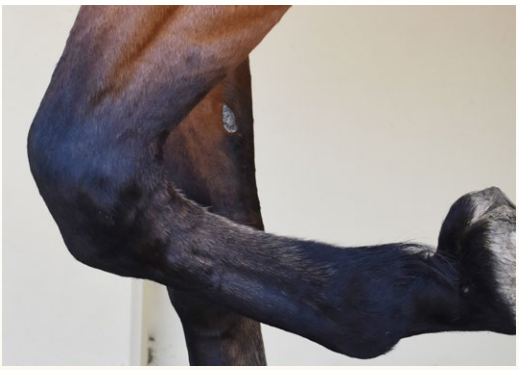
5 **Repeated corticosteroid injections can have negative long-term consequences.** Positive effects of corticosteroids are reported at low doses in horses, but high doses and/or long exposures can result in deleterious effects on cartilage. Timing and disease status are important, with damaging effects reported when administered in healthy joints, as opposed to the desired anti-inflammatory effects observed when treating diseased joints.

6

Joint injections can alleviate hock pain but can be discontinued once hocks are fused. When cartilage that normally protects the bones is worn away in the lower hock joints, synovial fluid production decreases and the exposed bones rub together, causing irritation and promoting bony growth. Hock bones can fuse together, typically in the two lower joints (which do not have significant roles in movement). The process is uncomfortable, and often managed with corticosteroid injections. Distal hock OA can progress to complete fusion in advanced cases, making joint injections difficult due to lack of joint space, and no longer effective. Bony fusion can be confirmed radiographically; however, the horse's degree of soundness is the best indicator of a successful outcome.

7

Horses are more sensitive to joint infections than other species. A rare complication of IA injections is joint infection. Utilizing appropriate needle sizes and types, not reusing needles, and adhering to sterile techniques limits complications.



8

Continued research is needed to determine the safety and efficacy of bisphosphonates for treating joint disease. Healthy bones undergo continual, natural turnover (remodeling). Cells called osteoclasts break down old bone, and osteoblasts create new bone. Bisphosphonates block osteoclasts, reducing remodeling. Approved for use in horses four-years-of-age and older, clodronate disodium (Osphos) and tiludronate disodium (Tildren) are safe and effective at relieving pain and lameness in horses with navicular syndrome. However, off-label use (when the drug is used to treat something other than navicular disease) has not been thoroughly researched, might not be effective, and could be harmful. Effects on kidney health, inhibition of bone growth, and interference with bone adaptation to exercise and healing of microdamage are of concern. Studies in humans and dogs suggest bisphosphonates as preventative treatments may cause bones to weaken, predisposing them to stress fractures.

9

"Nutraceutical" has no regulatory definition and the effectiveness of equine joint supplements is inconclusive. The term "nutraceutical" ("nutrition" + "pharmaceutical") is commonly equated with beneficial effects but has no regulatory definition. Peer-reviewed studies on joint supplements are limited, especially in horses with naturally occurring OA. Questions about anti-inflammatory effects, oral bioavailability, appropriate concentrations, and anti-oxidative properties remain. Research has also revealed quality issues. In a study of 23 equine glucosamine products, four had less than 30% of the amount claimed on the label. Consult your veterinarian to determine which specific ingredient(s) and product(s) are right for your horse.

10

Competition rules prohibit some joint injections and supplements. Certain drugs can be detected weeks after the last dose and some herbal supplements can produce metabolites similar to forbidden substances. Check lists of prohibited substances and note required withdrawal times for permitted medications prior to administering any substance to a horse competing at events governed by the Fédération Equestre Internationale (FEI), the United States Equestrian Federation (USEF), or other regulatory bodies.

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UC Davis Offers the Latest Advances in **Equine Joint Therapies**

Dr. Julie Burges

The Transfusion Medicine Service at the UC Davis veterinary hospital provides an array of specialized blood products for many species in addition to horses, including dogs, cats, cows, llamas, sheep, goats, and pigs. More than 800 transfusions take place at the veterinary hospital annually. In 2020, 93 horses received 143 units (each unit is approximately one liter) of whole blood or blood product.

Through this service, the veterinary hospital also offers different options for equine joint therapy, all of which are made using the horse's own blood, including:

- **Interleukin-1 Receptor Antagonist II (IRAP II) –** The preparation of this biologic stimulates the production of regenerative and anti-inflammatory proteins, among others. An incubation period of approximately 24 hours is required before the product is ready for administration. However, once processed, IRAP can be safely stored and used for future injections for up to one year.
- **Platelet Rich Plasma (PRP) –** Platelets are concentrated and are able to release increased concentrations of growth factors to reduce inflammation and aid in the healing process.
- **ProStride –** Contains a higher concentration of platelets and an increased concentration of IRAP. Both PRP and ProStride take approximately 30 minutes to process, so the treatment can happen the same day the horse is seen at the veterinary hospital.

"The services offered at UC Davis are unique because most clinics have only one of these options," said Dr. Julie Burges, manager of the UC Davis veterinary hospital Diagnostic Services Laboratory. "Our equine clinicians have all three options at their fingertips and can choose the best treatment for their patient."

To learn more, or to schedule an appointment with an equine clinician, please contact the UC Davis veterinary hospital large animal clinic at (530) 752-0290.