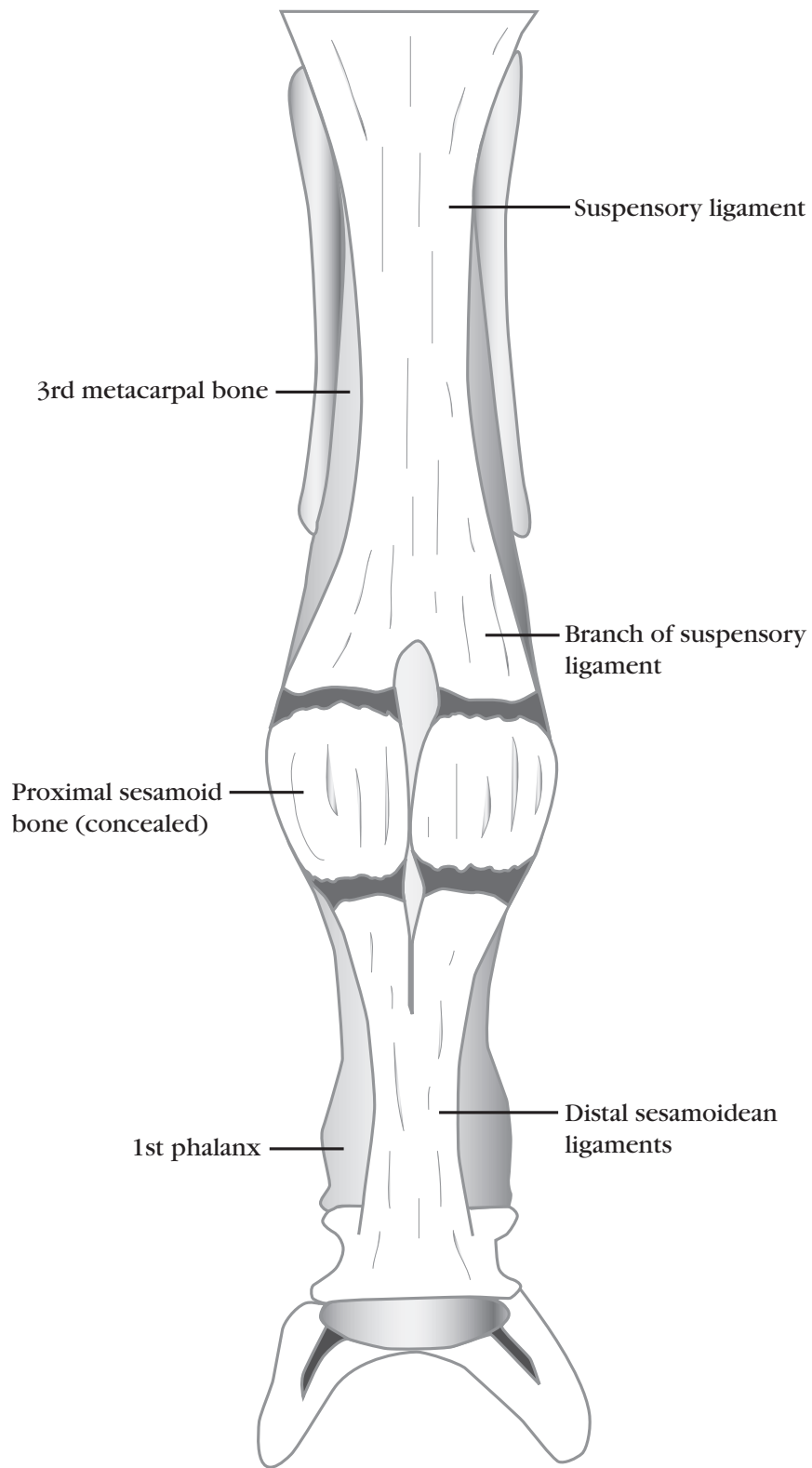


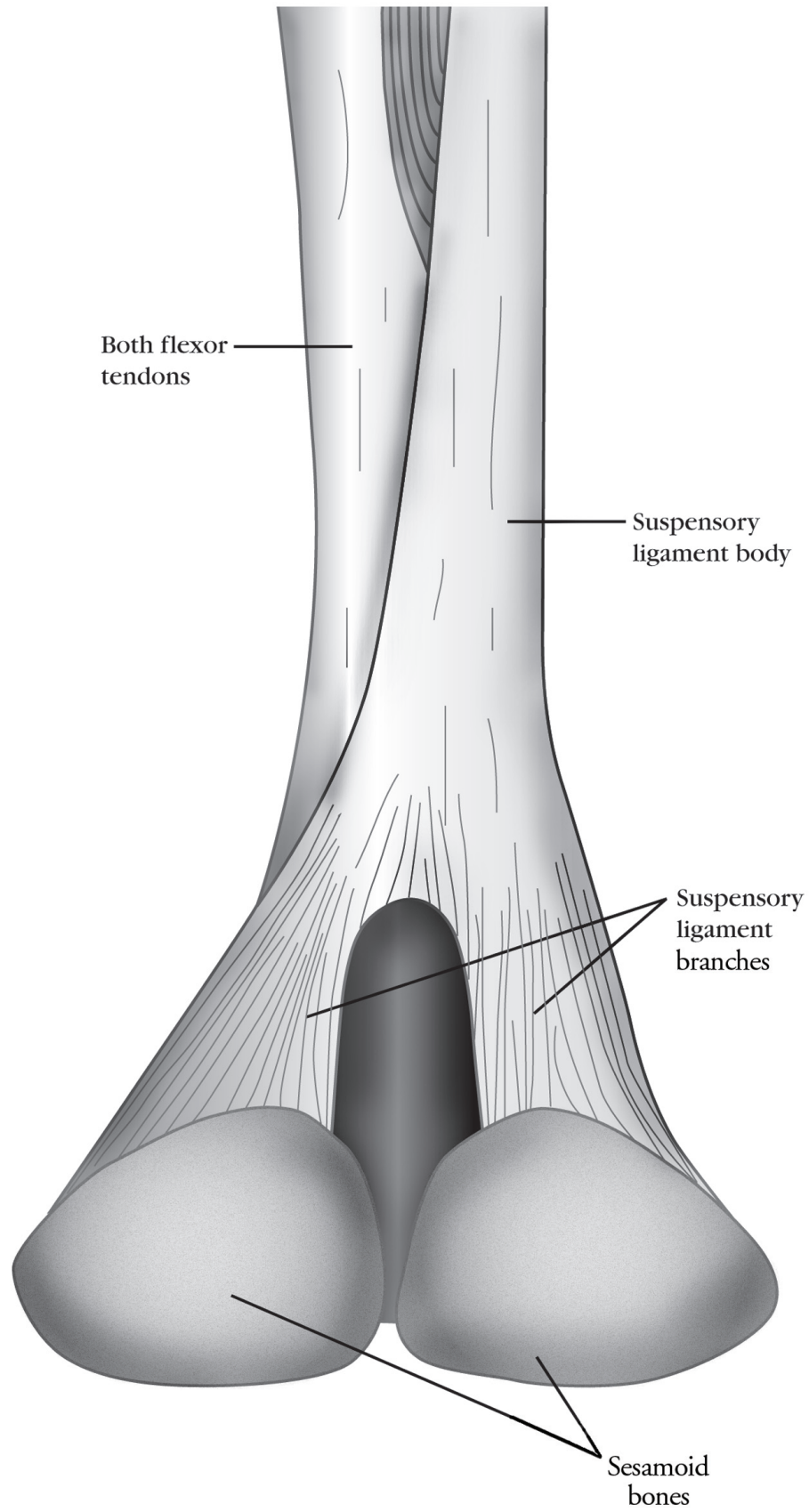
DSLD: RESEARCHING THE RESEARCH

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KNOWLEDGE IS GAINED FROM THE CRITICAL REVIEW OF FACTS. We all love our horses and want them to live strong, healthy lives. If they have medical problems, we want to find the answers. Suspensory problems in all equines have been researched for years. "Therapy of chronic insertion desmitis/desmopathy of the proximal suspensory ligament in the equine front and hind limb is somewhat frustrating. This condition is characterized by a high rate of recurrence and low long term success," says German researcher K. J. Boening, DVM, MS. A recent equine study done in California determined that, "91% of horses that died because of a musculoskeletal injury below the knee had a suspensory or distal sesamoidean ligament injury." The study goes on to say that suspensory injuries "caused 36% (584 of 1,601) of deaths of racehorses over the last eight to nine years." It is one of the most vulnerable places in the physiology of all horses; an area where most equine injuries occur.

Research on suspensory failure in Peruvian Paso horses has been going on in some form since the 1980's. But what kind of research? How was the research done? How complete was it? Were there conclusions that could apply to all horses? How did the research arrive at its conclusions? If we want to truly help our equine friends these are important questions. For the love of our horses, lets take a look at these research projects.





The first study of suspensory ligament failure in Peruvian Horses was done at the veterinary medical teaching hospital at the University of California at Davis. It was done by Doctors P.B. Pryor, R.R. Pool and J.D. Wheat. From the years 1969 thru 1983 (15 years), the U.C. Davis hospital examined 181 Peruvian horses. 53 were diagnosed with musculoskeletal problems and of those, 17 were diagnosed with suspensory failure and were included in this study. Symptoms included swollen fetlocks and dropped pasterns that continued to drop even with treatment. A pathological study of eight of those horses was done by Dr. Roy Pool.

The Davis doctors concluded that while they had seen some of the same problems in other horses, the Peruvian horses that they examined had these problems in a variety of ages and their response to therapy was disappointing when compared to other horses. In fact, the horses' treatment ended most often in euthanasia. The most interesting information that came from the pathological exams done by Dr. Pool, was that of a collagen defect that would not let the ligament fibers repair themselves in a normal way.

The next study to have a large impact was done by Dr. Jennette Mero and Dr. Roy Pool of the Davis study. They were now referring to the disease as degenerative suspensory ligament desmitis, or DSLD, based on an article by Dr. Jan Young, who had coined the term in an all breed study done in 1993. Dr. Mero's paper was very similar to the Davis study and consisted of 20 afflicted horses in which a pathology was done on 16. A defect in the collagen bundles, that over time began to swell and degenerate, was noted. Dr. Mero concluded that this was particular to Peruvian Horses and should be considered when any examination for lameness occurs.

The study that is on going now is being done by Dr. Halper, at the University of Georgia. Dr. Halper feels that DSLD is a systemic disease. It has to do with proteoglycans contained in the cartilage and connective tissues. It can occur all though the body but is more noticeable in places where stress and trauma occur. For example, it could happen in the connective tissue in the eye, but one would notice it more in the leg where it is more likely for injuries to occur. So, for Dr. Halper, it is not just suspensories. She feels that symptoms can be hard to find; they don't necessarily have to exhibit swelling or dropped pasterns. She feels it doesn't necessarily get worse. Cases can be sub clinical – there are no outward symptoms. In those cases, the only way to know if the horse has this condition is to euthenize and then dissect. She agreed that both words, suspensory and degenerative, are not accurate.

Halper likened it to Marfans syndrome, "similar to what Abe Lincoln had." Dr. Halper did say that heredity is not within the scope of her research. She indicated other people are working on that. Though the University of Georgia has been given more Peruvian Horse limbs for their research, they have samples from horses from other breeds and find no difference in the disease in different breeds. When asked how this condition affects the movement of horses she said she really doesn't know how it affects horses' movement because, "I am not a vet." She emphasized that it is very early in the research and there is much more to do, but she is working on a paper which will be published at some point

Research, when done in a strictly scientific way, has certain protocols that it follows to come to valid conclusions. Most medical research has a "control" that allows the researchers to check their findings with a healthy group. There are boundaries in the way the data is collected that restricts the conclusions of the researchers. All three of these studies fall into the category of non-random research; lame horses were presented to the researchers, not discovered at random in the population *which restricts its conclusions to just the subjects studied*. L.R. Gray in her book, *Educational Research*, states that, "when non-random samples are used, it is not possible to specify what probability each member of a population has of being selected for the sample. In fact, it is usually difficult, if not impossible, to even describe the population from which a sample was drawn and to whom the results are generalized."

A non-equine example of this would be if I were presented with 20 American women with lung cancer, I could explain how the disease affects their lungs or how it affects their breathing, or how cancer metastasizes, or what cancer is, in those 20 American women. However, I could not draw conclusions on what lung cancer was like for all women nor could I say American women have more lung cancer than American men or that they have more cancer than Mexican women. Making conclusions on populations requires a much larger sampling than 20 subjects.

The book *Elementary Statistics* states, "For descriptive research, it is common to sample 10 to 20% of the population." For the Peruvian horse that would be approximately 2,000 horses selected *at random*, assuming a population of 20,000 horses. To compare with another breed, 10% of that breed would have to be selected at random and the results compiled. Then a statistical comparison could be stated.

The Davis study and the Mero/Pool study make a correlation between collagen and suspensory ligament failure, while Dr. Halper makes a correlation between proteoglycans and a connective tissue defect. However, a correlation that exists between two things only means they have a relationship, like cold weather and snow; it does not mean that one thing causes another to happen. The cause could be any one of many variables. The economist and noted statistician, Steven D. Levitt, states, "If only one correlation is measured, the answer is not very meaningful." If we go back to the women with lung cancer and look for other correlated variables, it might be important to find out if the women smoked, or if they lived in Los Angeles.

As many variables as possible need to be considered for research to be meaningful and valid. What are some of the variables not considered in these studies?

I. EXERCISE IN YOUNG FOALS

Horses are made to move, and in their natural setting, they move and exercise from the day they are born. At the department of Equine Sciences at Utrecht University, the Netherlands, a study was done on the importance of exercise at an early age. "It was proven that the shaping of the collagen network during the so called process of "functional adaptation" is a *once in a lifetime process*.

It was indeed proven that certain post-translational modifications of collagen, and the over-all collagen content, not only *did*

not develop the normal topographical heterogeneity in continuously box-rested foals, but failed to do so well after the animals were released from their confinement. This can only be interpreted as a decrease in tissue quality and an increase in the proneness to injury," (A. Barneveld, "How exercise influences the injury resistance of the equine musculoskeletal system"). This biochemical shaping in early life shows the importance of exercise in young horses for a proper development of the musculoskeletal tissues. It was shown to affect cartilage, tendons, ligaments and even the bone as well.

2. HOOF TRIMMING

In a recent *Equus* article on keeping horses tendons and ligaments injury-free and preventing breakdowns, the *number one precaution* is regular trimming, (*Equus*, May 2005, issue # 331). According to this article, a hoof that is long in the toe and low in the heel shifts weight backward increasing pressure on the digital flexor tendon and the suspensory ligament. It goes on to say, "if your horse has long pasterns and low heels you should talk to your farrier or veterinarian."

Coco Fernandez, the internationally-renown master farrier from Peru says, "It's more complicated than just low heel and long toe. When trying to grow heel, many Peruvian Horses' heel will grow forward moving the hoof to an even more stressful position on the tendons and ligaments. Correct balance can be a matter of millimeters, the difference between a sound horse and a lame one. If the condition is not stabilized, the horse will continue to degenerate and eventually breakdown completely. Coco says, "I have 'healed' many horses diagnosed with DSLD, some just weeks before they were to be euthanized and if I can 'heal' them, it's not a disease; it's an injury."

This is what Peruvian Horse owner Patty White had to say about trims on the internet,

"My vet was on called to put down my 15 year old Peruvian Paso mare after a year of lameness, farriers, vets and finally the equine hospital where she had all the x-rays and ultrasound and was shod by a special farrier who x-rayed her angles. She was diagnosed with DSLD and was on 4 grams of bute a day and barely able to walk. A vet (who was a farrier for many years before becoming a vet) rushed here the first week in January and trimmed her feet and put shoes on her. She said that the problem was her feet and not her suspensories. She trimmed and shod her every 6-7 weeks and after the third trimming, I was able to ride her again and she is happy and pain free." Patty continues, "She comes out every 6-8 weeks and has been trimming other Peruvians in Washington who have been diagnosed with founder/navicular and DSLD. All of them are doing great!"

3. GOOD CONFORMATION

Good conformation is basic to a healthy horse and bad conformation can cause many problems. Hindquarters with bad angles and long pasterns cause incredible strain on suspensory ligaments. Here is what the veterinarians say at Alamo Pintado Clinic in California, "The simple answer to this problem is to not breed bad-legged horses to bad-legged horses, or to breed any horse with a severe, inherited conformation fault. Once that becomes obvious, the problem goes away."

4. PROPER NUTRITION

How important is proper nutrition? Tina Woodworth of Chino, Washington, thinks it's important. Her horse was showing the classic symptoms of DSLD, swollen fetlocks, lowering of the pasterns, and was later diagnosed by her vet as having DSLD. She was told that she might have to have the horse euthanized. Tina got a second opinion and had some blood work done and her horse was found to be deficient in selenium, a common problem in the northwest part of the United States. Tina started using a supplement with selenium and within six weeks the horse was fully recovered. That was three years ago; Tina has her trail horse back.

David Nash, equine nutritionist, says, "The importance of a correct balance of minerals is increasingly being recognized as necessary in trying to prevent developmental disorders. Too much or too little of a particular mineral can be equally as catastrophic to bone and cartilage formation and so it is important not to consider minerals in isolation as many can interact, affecting their availability to the horse."

5. CONDITIONING

Horses in their natural environment are always on the move, breathing fresh air and exercising their legs as they graze on grass. It's hard to imagine a more unnatural setting than a 12' by 12' stall in a barn. In the wild, you never see fat horses because in their natural environment they are forced to cover many miles to get all the nutrients for survival. The natural home of a horse could not be more unlike the green pastures and large flakes of alfalfa they are presented with on many ranches. Overweight and sedentary horses develop systemic problems just like people. "The cartilage responds best to regular or intermittent compressions and relaxations such as when the horse is roaming as he grazes. If the horse is standing in his stable for long periods the joints have to cope with continuous compression, which can be quite detrimental to the health of the cartilage. If immobilization is enforced on the horse for long periods, such as box rest or constant stabling (common in racehorses), the proteoglycan content of the cartilage will decrease. As long as the horse is brought back into work slowly and the loads enforced on the joint are gradually increased, the proteoglycan content should return to normal. However, strenuous exercise can injure the cartilage and result in a decrease in the proteoglycan content," (David Nash Bsc, Equine Nutritionist).

Weekend warriors can be loosely defined as horse owners who ride their stall-bound horses once a week or even less, and then go on a four-hour trail ride. The incredible heart (brio) of the Peruvian Horse is well documented; even an unfit or poorly conditioned Peruvian horse will push itself well beyond the point where injuries can occur, a place where most breeds will have already have stopped. James Hamilton, DVM of South Pines Equine Associates in North Carolina, states that, "Damage (to tendons and ligaments) most often, is cumulative, starting with minor traumas that weaken tendon fibers and cause mild inflammation without lameness or detectable soreness." He likens the process to a rope with individual fibers breaking; "Eventually," he says, "you would reach a critical threshold of weakness." At that point the horse becomes lame, swelling begins around the injury and horse will then need a lot of care and a long recuperation.

6. BIOPSIES

Why should researchers do biopsies for leg problems? Because that's the only way of finding *Onchocerca Reticulata*, one form of the nuchal ligament parasite. These are microscopic parasites that migrate to the tendons and suspensory ligaments. They are very common throughout the United States and are spread by gnats or black flies.

In a study by RM Corwin and Julie Nahm, of the University of Missouri College of Veterinary Medicine, states that these microfilariae are "transferred through connective tissue to suspensory ligaments and tendons causing nodule formation and lameness" and can only be found with a biopsy. What does Merial.com say about *Onchocerca Reticulata*? "Adult worms in ligaments and tendons can cause swelling. Microfilariae may infiltrate and irritate the cornea and iris of the eye, sometimes causing blindness. In heavy infections, adult worms can cause lameness, swelling in ligaments, and eye irritation." Victor Alexander, DVM says, "This parasite can work in conjunction with other problems and the accumulation may be the very thing that pushes the horse to break down." Dr. Alexander goes on to say, "Without a biopsy, the parasite remains unidentified, and no one could completely understand the problem."

7. THE RIDER

At the University of Veterinary Medicine in Vienna, researchers found that the correct balance of a good dressage rider can help a horse stay sound, (*Equus*. "How Riders Affect Lameness," May 2005). Many of us have seen poor equitation from novice riders and in some cases, professionals with horses struggling along in false collection or completely out of balance. Sally Swift's book, *Centered Riding*, talks about unbalanced horses feet hitting the ground so hard that, "I thought either the animals' feet or the ground would shatter." She goes on to say, "When a horse is moving in good balance, his feet can scarcely be heard touching the ground. A horse who is unbalanced and heavy on the forehand hand, particularly with a stiff or inexperienced rider will bang and thump on the ground."

For research to be of any value it needs to document facts with data, and substantiate opinions with facts. When statistics are given they should be documented and verifiable. Reliability is usually expressed numerically, as a co-efficient. A high co-efficient indicates high reliability (e.g. "We are 95% positive"). Scientific research does not contain statements like: "it seems likely," "we feel," "its an interesting possibility," "The possibility of a collagen defect is most interesting to us at this time," or "the problem appears to occur frequently in this breed."

These are opinions, not scientific facts, and these statements are not backed up by any meaningful data. They really are not very helpful in understanding the problem. Statements by researchers that the Peruvian Horse is predisposed to suspensory ligament problems, or comparing DSLD to HYPP in Quarter horses, have created a very distorted view of the entire breed. Researchers who continue to discuss with the general public every unproven hypothesis or interesting possibility as if it were scientific fact, have created a subculture of self-promoting internet "experts" who when e-mailed privately will give you their personal research on bloodlines to avoid. These people do a disservice to our breed, and their "research" can only be described as self-serving.

What do we really know from thirty years of on-and-off research? We know that horses break down for reasons that we still don't always fully understand. If there is a disease, it affects all breeds of horses; however we still don't really know what it could be. There has never been any research on populations so we only have the word of veterinarians who see the horses daily. After thirty years experience and literally thousands of cases of suspensory problems, the entire staff of five veterinarians at Alamo Pintado states, "The veterinarians at APEMC have always found it to be curious that this condition of the Peruvian Horse has not been described in any equine lameness or surgery text and has not surfaced as a cause of unsoundness in the Peruvian Paso Horses that we have dealt with on a daily basis for the last 30 years. On the contrary, we have found suspensory desmitis to be very rare in the Peruvian Paso population that we treat compared to a relatively high incidence in the racehorse, jumper and dressage horses."

Research is essential; it is important for our equine friends. Without research we will never find answers to the really tough questions. But it must always be valid research—carefully carried out under the auspices of major veterinary hospitals, involving multiple vets, control groups, scrutinizing multiple variables, randomly testing horses regardless of breed, and having large enough populations to draw careful and valid conclusions. It should be done among scientists and researchers and not on internet chat lines. Until then, we would do well to greet some of these studies with healthy and objective skepticism. We want the best for our horses. 🐾

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