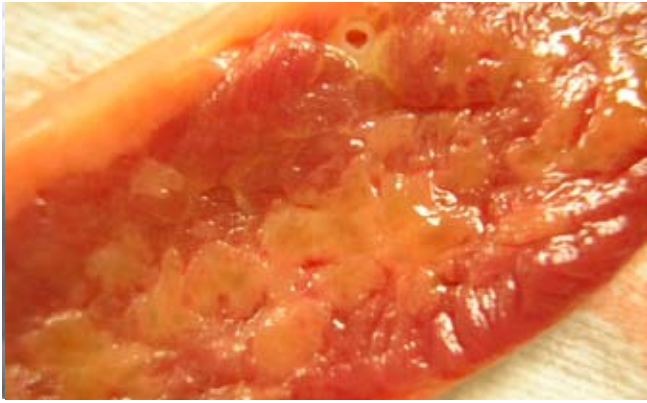


Equine NEWS

COLLEGE OF VETERINARY MEDICINE | FALL 2006 | VOLUME 3, NUMBER 4

Selenium Deficiency Cases Appearing in Washington



View of a heart muscle from a horse that died due to severe selenium deficiency. The lighter colored tissues in this photo are areas in which heart muscle cells died prematurely.

Two horses with severe clinical signs related to selenium deficiency have been seen at the WSU Veterinary Teaching Hospital this year.

"That might not sound like a lot, but both horses died from the condition," said **Dr. Macarena Sanz**, a WSU resident veterinarian in equine medicine. "And there may be more cases out in the field that we have not heard about."

Many horses have mild or sub-clinical cases of selenium deficiency, with signs such as decreased immune function or impaired reproductive efficiency. Horses with acute cases, however, experience severe muscle abnormalities, and the prognosis for survival is often poor.

"It is important that owners realize selenium deficiency can be prevented," Dr. Sanz said. "We know most soils in the Northwest, as well as in many other areas in the United States, are deficient in selenium, but owners can supplement

their horses' feed to compensate."

Selenium is a mineral found in soil that horses utilize as a component of an enzyme that helps protect cell membranes from the damage caused by normal cell metabolism. Selenium works in conjunction with vitamin E. If selenium is not present, the cells may fragment and die. Selenium also helps the immune system function, so selenium deficiency is associated with immune suppression, and horses may have a decreased resistance to infections.

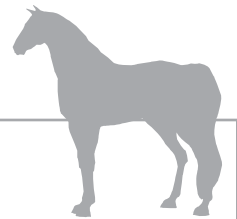
Horses usually get the selenium they need while foraging. However, plants grown in selenium deficient soils will be low in this mineral and horses can develop a deficiency. Both foals and adult horses are susceptible to what is called nutritional muscular dystrophy (also known as white muscle disease, muscular dystrophy, or nutritional myodegeneration). This is a degenerative condition in which muscles actually break down. This disease is also present in other species such as pigs, calves, and lambs.

"What we see is massive muscle damage," Dr. Sanz said. "The clinical signs and the severity of the disease vary depending on the muscles affected. When the heart is affected, the prognosis is very poor. Affected foals can be weak at birth or they may look normal the first 24 hours of life and be weak and recumbent or unable to nurse later on."

Signs of selenium deficiency or nutritional muscular dystrophy in horses include severe muscle cramps, sweating, stiffness, and an increased pulse. An affected horse may also have red or brownish urine, indicating muscle damage. Skeletal muscles, heart, and the chewing muscles are more commonly affected in adult horses, and the muscles involved in nursing are more commonly involved in foals.

"A severely affected horse will have painful muscles and be stiff, won't

continued on page 6



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Laser Surgery at WSU



Dr. Farnsworth performing laser surgery on a horse with a squamous cell carcinoma tumor in its nasal passage.

A horse that needs surgery may be a good candidate for a procedure that means less pain, swelling, bleeding, and, in many cases, faster healing.

This is possible with laser surgery, available at WSU's Veterinary Teaching Hospital. It can provide many benefits in appropriate cases. Laser stands for Light Amplification by Stimulated Emission of Radiation, and functions by the different ways the instrument can concentrate and generate light wavelengths. Two types of lasers are used at WSU for horses: the carbon dioxide laser and the diode laser.

"You can use lasers for minimally invasive surgery for conditions that in the past were either inoperable or required major exploratory surgery," said **Dr. Kelly Farnsworth**, a WSU professor and board-certified equine surgeon. "The laser light interacts with tissue very differently. The carbon dioxide laser interacts very minimally

with tissues. It exerts its effects when it comes in contact with water and doesn't penetrate very far.

"It is probably the most commonly used laser we have for treating skin tumors in horses, and for use as a surgical scalpel for cutting and making incisions," he said. "With the diode laser, the main advantage is that it can be passed through an endoscope to do upper respiratory surgeries. This allows us to get a cutting instrument into places that traditionally have very poor access. The diode laser can also evaporate or coagulate tumors in the nasal passage, which cannot be reached any other way."

The diode laser differs from the carbon dioxide laser in that it interacts with colored proteins, such as those found in blood or dark tumors. While the carbon dioxide laser will only penetrate 1-2 mm in water, the diode laser will pass through clear water with no interaction and not be absorbed until it hits something with color. The diode laser is much more effective in areas of significant bleeding or when large tumors are present.

In addition to surgery, lasers can be used to revise or shrink scar tissue, and sterilize lacerations in horses by evaporating the bacteria in the wound.

"One nice thing about lasers is that they promote hemostasis, the process of blood clotting," Dr. Farnsworth said. "When cutting something with a laser, the cut ends of the blood vessels and nerve endings are sealed so there is less bleeding and the procedure is less painful."

Laser surgery is not uncommon in small animal veterinary practices and is often used to declaw or remove masses on small animals. "Fewer equine clinics have them just because of the cost of the equipment, and lasers are not a typical surgical instrument you use everyday," Dr. Farnsworth said. "But when we need it at WSU, it is nice to have it available for use on a patient that will benefit from its use."

For more information about laser surgery or if a horse is a candidate for laser surgery, contact the WSU Veterinary Teaching Hospital at 509-335-0711 or Dr. Kelly Farnsworth at farns005@vetmed.wsu.edu. 📞

Meet Our Newest Resident, Dr. Kristin Gablehouse

The WSU Equine section is staffed with many competent veterinarians who occupy a number of critical positions on our health care team. Among them are several veterinarians training in residency programs. **Dr. Kristin Gablehouse** is the newest member of our team, joining resident veterinarians **Drs. Sarah Sampson, Matthew Brokken, Marta Gonzalez Arguedas, and Macarena Sanz**, featured in the spring 2006 issue of Equine News.

Residents are veterinarians who have completed at least one year of an internship or equivalent practice experience. As residents, they pursue advanced clinical training in a veterinary specialty area such as internal medicine or surgery. Completion of a residency qualifies them to pursue board certification with various specialty organizations. Residents typically work at the WSU Veterinary Teaching Hospital



for at least three years and are involved in many cases that contribute to the development of their high level skills. Many of the residents also engage in master's or doctoral research programs to enhance their competence as clinical scientists and future academicians.

Dr. Gablehouse began her residency in equine surgery at WSU in July 2006. Her emphasis is equine orthopedic surgery, lameness diagnosis, and the role of magnetic resonance imaging (MRI) in lameness evaluation. Dr. Gablehouse earned her veterinary degree from Colorado State University in 2005. She recently completed a one-year internship at a private equine veterinary practice in Oaksdale, California, where she assisted with elec-

tive and emergency surgeries, as well as lameness examinations and diagnostic imaging studies. Her goal is to pursue a career in equine sports medicine and surgery specializing in diagnostic imaging. 📞

Freezing Equine Semen Offers Advantages

In the past, using frozen semen was seen as a tedious process that could result in low fertility rates. Fortunately, over the years, it has become a tool that breeders can use with the help of their veterinarian to virtually ensure forever the bloodline of a valued horse, or to extend a breeding season.

This is a great advantage for breeds in which the registry approves artificial insemination with frozen-thawed semen.

“Some people still believe frozen horse semen does not work, but this is not the case. There has been a lot of progress that has made it easier in recent years,” said **Dr. Ahmed Tibary**, WSU’s large animal theriogenologist (reproduction specialist).

“Freezing semen is really the only insurance an owner has against fertility loss in a stallion,” he said. “Many breeders know it can be very difficult to find a solution for a stallion that becomes infertile. I would encourage breeders that as soon as they purchase a potentially highly valuable young stud, that they insure its fertility by freezing an adequate quantity of semen from that horse.”

This method can be especially useful if the horse is intended for performance events such as hunting/jumping or dressage, in which stallions are often gelded for maximum performance.

“One of the biggest selling points of this technology is to be able to go back and use the frozen semen from infertile stallions or high-performance geldings,” Dr. Tibary said. “It is nice to be able to retrieve the genetics if the colt turns out to be really good or very special to the owner.”

Freezing semen is also an insurance policy for colts or stallions that die prematurely or become incapacitated from an injury or illness. “Many times in an emergency situation, the owners will want to collect semen,” he said. “At that point the only way to freeze semen is to collect it chemically if the stallion is injured or from the testicles after castration if the stallion is terminally ill. Semen collected post-castration is often less fertile.”

Freezing semen can also be a valuable way for breeders to extend the breeding season for a stallion in high demand or one that spends part of the breeding season performing in competition.

Technically, frozen semen can last for thousands of years if it is stored properly in liquid nitrogen, a service that is offered at WSU if it is collected there.

As for the fertility of frozen semen, which is different for each stallion, it can be as high or slightly below fresh or cooled semen. “I recently used semen from a stallion that died a long time ago and it had very good fertility,” Dr. Tibary said.

For stallions with semen that does not freeze well, there are several techniques available at WSU that can improve the fertility of frozen sperm after it is thawed.

“The fertility rate really goes back to the both the fertility of stallion and the mare, which is highly variable,” Dr. Tibary explained. “I look at it from a convenience point of view, not just from getting the maximum fertility. There are advantages to frozen semen that are worth losing maybe ten percentage points of conception rate, and some stallions perform just as well whether their sperm is fresh or frozen.”

Stallions that come to WSU for semen collection undergo a thorough reproductive examination. Semen is collected for freeze-testing to find which freezing protocol will work best for that individual stallion. Once the freezing protocol is determined, the stallion is put on a collection schedule to freeze the desired number of doses the owner wants.

“Also, when a stallion comes here, we can test it for diseases that may be transmitted through semen, so the protocol is fairly involved,” Dr. Tibary said. “If we see a normal stallion at the peak of its reproductive ability, we can collect anywhere from nine to twelve doses of frozen sperm for each collection. That is pretty good.”

For more information about freezing semen or to make an appointment, contact the WSU Veterinary Teaching Hospital at 509-335-0711 or Dr. Tibary at tibary@vetmed.wsu.edu or 509-335-1963. 🐾

Azim and Aran are half brothers, both from a stallion, Arik, who died more than 10 years ago. The colts carry the genetics of the Akhal-Teke breed, a breed close to extinction with a global population of about 1,000 mares and 400 stallions.



Azim

“There are no stallions anywhere in the world that would be this close to the original founders of this blood line,” said owner Milena Stoszec of Akhal-Teke Ranch in Moscow, Idaho. “The successful pregnancies and subse-



Aran

quent deliveries of two healthy colts from Arik’s frozen semen, performed and monitored by Dr. Tibary, are a great contribution to the preservation of these genetically valuable ancient horses. It also allowed us to reach back several decades and bring to life genes that otherwise would be lost from the Akhal-Teke population. This season, thanks again to Dr. Tibary, we have one more mare pregnant to Arik, and hope for another healthy foal.” 🐾

Causes of Colic in Horses

Colic is a common ailment in horses that can have more than 70 causes. According to data from the USDA, colic is the second leading cause of death in horses, next to old age.

This data, generated from a 1998 study conducted by USDA's National Animal Health Monitoring System, and including information from the National Agricultural Statistics Service and the American Horse Council, estimated that 4 percent of horses suffer from colic each year, and of those, 11 percent die from it. The annual cost to horse owners was estimated at \$115 million.

"Colic is a general term for abdominal pain or a belly ache in a horse that can be related to gastrointestinal track or other organs, such as the liver or kidney," said **Dr. Julie Cary**, a WSU clinical instructor of equine surgery and emergency care. Some cases of colic are mild, but others can be fatal depending on the cause.

Colic can be caused by gas distension, food impactions, intestinal tract spasms, intestinal displacement or torsion (twist), intestinal enteritis or inflammation, and gastric distension or stomach rupture. Some are more specific to different geographic areas, such as sand or enterolith formation. At other times, the colic's cause is unknown.

"The most common cause is gas colic or spasmodic colic," Dr. Cary said. "With gas colic, the horse gets a big, uncomfortable gas bubble in its intestine, and with spasmodic colic, part of the intestine spasms, which causes pain."

These types of cases are generally mild compared to other forms of colic, including intestinal displacements, twists in the large colon, or strangulation of a section of the bowel (generally in the small intestine), resulting in a loss of blood supply. Examples of strangulation include an abdominal lipoma or fatty tumor that wraps around a section of small intestine, or when the small intestine works its way into a small space, such as the epiploic foramen.

Colicky horses often display symptoms such as pawing at the ground, looking to their side, rolling or laying down and getting up, and a loss of appetite or refusal to eat. Unfortunately, it can be difficult to determine how serious a case of colic is based on the horse's symptoms.

"Some cases resolve when the horse is walked around, which can relieve a gas bubble that builds up," Dr. Cary said. "But if the horse does not show improvement within 20 minutes, then it is best to have a veterinarian evaluate it."

Some horses may also appear violently painful, which may indicate a serious case. In this instance, contact a veterinarian immediately.

To help with gastrointestinal pain, many veterinarians administer a nonsteroidal anti-inflammatory drug,

as well as giving mineral oil through a naso-gastric tube. Sedation and other more potent pain medications may be needed depending on the horse's specific condition.

"As veterinarians, we often pass a naso-gastric tube through the horse's nasal passage and down through its throat to its stomach," Dr. Cary said. "Horses cannot vomit, so the tube is important because if the horse is building up pressure in its stomach, the excess pressure and stomach content may rupture it. Decompressing the stomach with a tube can be life-saving."

If spasmodic colic is determined as the cause, veterinarians can administer a drug called Buscopan that will treat the spasms. "This drug is very specific in its treatment of this certain type of colic and will actually stop the spasms," Dr. Cary said.

"If the case is more serious, often the horse's heart rate will be high, and it will not respond to drugs," she said. "It may also have reflux in the gastric tube, or will not have a normal rectal exam. A lot of things can cause a serious case, so it is best to get a veterinarian involved."


Some horses with a serious case of colic may need surgery. "At the WSU Veterinary Teaching Hospital, we see about 75 to 90 colic cases a year, and of those, about one-third to one-half need surgery," Dr. Cary said. "Usually, about 90 percent of colic cases respond to routine treatments and do not require hospitalization or surgery, but we commonly have serious cases referred to us here at WSU.

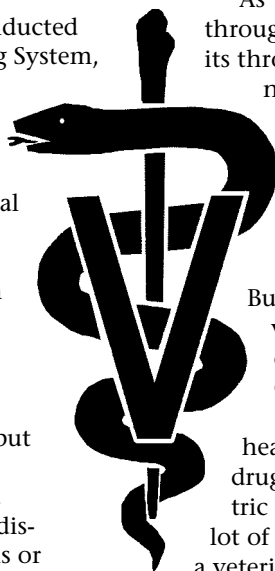
"The survival rate of horses that do need surgery depends on what the cause of colic is," she explained. "If the horse is seen early, no matter what the cause, we have a very good chance of saving it and it often has a faster recovery."

Horses that do not require surgical intervention may receive intensive fluid therapy or other more specific medication and advanced care.

Colic can happen in any horse, but owners can take steps to try and prevent it. First, keep a routine feeding schedule, and make sure horses always have access to clean water, especially during weather changes. Owners should throw out moldy hay or grain, and feed hay and water before grain. Exercise is also important for horses, but it is best to wait until they have cooled down before being fed or watered. Intestinal parasites may also cause colic, so it is best to keep horses on a regular preventative worming schedule.

"Any food and exercise changes an owner plans for a horse should also be made gradually," Dr. Cary said.

For more information about colic or in case of a colic emergency, contact the WSU Veterinary Teaching Hospital at 509-335-0711. More information about colic can also be found at www.myhorsematters.com. 



Rare Treatment for Equine Cancer a Success



Ghostbuster receiving radiation treatment in WSU's linear accelerator under the care of the WSU equine surgical team.

Squamous cell carcinomas are one of the most commonly diagnosed cancers in horses. Last year, the equine surgical team at WSU's College of Veterinary Medicine successfully treated this type of tumor near a horse's eye with a method typically reserved for smaller animals, such as dogs, cats, and people.

Ghostbuster, a teenaged Clydesdale/Thoroughbred cross, suffered persistent weeping in his right eye due to a squamous cell tumor, a slow-growing type of tumor that can become malignant over time.

"His owners and referring veterinarian, Dr. Andy Denome, had tried a variety of unsuccessful treatments, including topical chemotherapeutic agents, but it continued to come back every time the treatment ended," said **Dr. Kelly Farnsworth**, a professor and equine surgeon at WSU.

Clinical evidence has shown that squamous cell carcinomas are susceptible to radiation therapy. The WSU Veterinary Teaching Hospital features a linear accelerator like that used with human cancer patients, one that can deliver very focused radiation therapy. One of the most advanced machines in the world dedicated to animal cancer treatment, the WSU linear accelerator uses either electron beams or high-energy x-ray radiation to treat tumors with minimal impact to the surrounding healthy tissue.

"The linear accelerator works extremely well in similar tumors in dogs and cats, so we thought why not try it in this case?" Dr. Farnsworth said.

Two challenges faced Ghostbuster and his WSU veterinarians—his size and the number of treatments he was to receive. At 1,400 pounds, Ghostbuster would be the largest animal to be treated in WSU's linear accelerator. WSU College of Veterinary Medicine cancer specialist **Dr. Janean Fidel** developed the protocol to be used, and the WSU equine team developed a method of anesthetizing the horse, and moving him to and from the linear accelerator in a safe and rapid manner.

"We used a protocol where we anesthetized Ghostbuster twice a day for five days," Dr. Farnsworth said. "This protocol had not been used in horses before. Typically the procedure from the time he was anesthetized to the time he was back in the recovery stall was around 12 to 13 minutes. The treatment in the linear accelerator lasted only about 25 to 30 seconds, and the rest of the time was transporting him to and from the linear accelerator. He came through the treatments without any problems at all."

Better yet, Ghostbuster's tumor completely regressed and more than a year later, the horse is cancer free. The incessant weeping in his eye was also eliminated. "The results of this therapy in other species and certainly in this horse have been very encouraging," Dr. Farnsworth said.

Radiation therapy is not the only option in treating a horse with squamous cell carcinoma, but the treatment depends on the extent that the tumor has spread and the stage of cancer the horse has.

"If we find the tumor only on the third eyelid, which is the most common place we see it, then we generally just surgically remove the third eyelid," Dr. Farnsworth said. "If the tumor is small and hasn't spread, the horse can be treated with laser radiation to evaporate the tumor and make it go away. But when the cancer is extensive and involves deeper structures, the options are removing the eye or trying some other form of radiation.

"Many horses end up losing the eye to prevent tumor regrowth," Dr. Farnsworth said. "This was not necessary with our protocol, so I think there are a lot of horses that could benefit from this treatment." 🐾

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Also feel free to call 509-335-0711 for **equine appointments** or **emergency care**.



Selenium Deficiency, *continued from page 1*

want to walk, and is sore when touched," Dr. Sanz said. "Other times in adult horses, they will appear healthy, but won't be able to swallow or chew."

A diagnosis is made based on clinical signs and a blood test to determine the amount of selenium present. A test can also measure concentrations of an enzyme that selenium is a component of. This test is particularly useful in cases where the horse has recently been treated with a selenium product.

"Once a horse has selenium deficiency, we supplement selenium and Vitamin E and provide supportive treatment until muscle regeneration occurs," Dr. Sanz said. "Sometimes horses are affected severely and there is nothing we can do for them."

"Selenium deficiency in horses can be prevented, so the main message is to supplement their feed if you are in a deficient area," she said. "We don't know why some horses are affected with severe clinical signs and some are not, but the risk is certainly there."

Supplementation should be performed under veterinary supervision. An appropriate supplementation rate is about 1 to 3 mg of selenium daily per horse. Horse owners should be careful to supplement their horses in the proper amounts. Too much selenium can lead to a toxicity, which can cause hair loss from the mane and tail, hoof problems, and lameness.

There are numerous products available for selenium supplementation, including oral and injectable products. Some, but not all, salt blocks contain selenium. If this is the only source of selenium in the diet, many horses do not ingest enough of the block to attain optimal selenium levels. It is best to consult a veterinarian about the most appropriate supplementation program for individual horses in a given area.

For more information about selenium deficiency in horses or how to prevent it, contact the WSU Veterinary Teaching Hospital at 509-335-0711. 

Equine News at the Speed of Light!

Beginning January 1, 2007, WSU *Equine News* will be available to our readers via e-mail. Instead of waiting for a hard copy in the mail, the newsletter will arrive in your e-mail inbox as a Web link to the WSU *Equine News* Web site to peruse at your convenience.

In it, you will be able to find out what is new with the WSU Equine Team, the latest in equine research, health issues, hospital services and activities regarding our college, and horse health throughout the Pacific Northwest. You can also meet our faculty doctors, residents, interns, staff, and members of the WSU Equine Advisory Board, learn about upcoming events at the college, and keep track of critical contact information for the Veterinary Teaching Hospital and college Web site. Online, the newsletter also offers the advantages of Internet hotlinks directly to the people and programs you read about.

The newsletter is published quarterly and is sent to teaching hospital clients, referring veterinarians, equine industry people, and horse lovers in general.

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