

Equine News

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*Dr. Sarah Sampson
and friend.*

WSU researching stem cells and surgical technique to heal equine suspensory ligament injuries

Suspensory ligament injuries are a common problem in horses that can result in performance-limiting lameness. In addition, chronically affected horses that are unresponsive to rest and rehabilitation programs may be unable to return to the same use as before the injury, and subsequently may be retired or euthanized.

Many times, ligament injuries heal slowly and are weaker than before an injury due to scar tissue that forms in the area of the injury. This scar tissue is never as strong or as elastic as the original tissue, which puts this area at higher risk for re-injury. Over the years, veterinarians have used many methods to help horses with ligament injuries, but the success rate remains low, particularly in hind limb suspensory injuries.

"Suspensory ligament injuries are a frustrating problem in performance horses because they can result in chronic lameness that limits the animal's performance potential," said

Dr. Sarah Sampson, a board certified equine surgeon at WSU who specializes in orthopedic sports medicine and magnetic resonance imaging (MRI). "These injuries are common in all types of performance horses, and only 20 to 40 percent of horses with hind limb suspensory injuries are able to return to work. A high number of horses with hind limb suspensory injury have recurrence of the injury after going through a rest and rehabilitation program, as they are put back into more strenuous work. The idea behind new treatments for suspensory ligament injury is to find ways to improve the ability of the ligament to heal with less scar tissue and more normal ligament tissue. This would theoretically decrease the chance of injury recurrence in the future."

Over the past six years, WSU's equine orthopedic team has conducted clinical research to help horses with ligament injuries. The main focus has been on proximal suspensory desmitis

(PSD), which is damage to the area of the suspensory ligament as it inserts into the cannon bone just below the hock.

A newer surgical technique was developed in England that has resulted in an increased success rate for horses with hind limb proximal suspensory ligament desmitis, called a neurectomy and fasciotomy. WSU's equine orthopedic team has been using this technique for the last five or six years and has seen an improvement in the number of horses that can return to performance after hind limb proximal suspensory ligament injury. This surgery involves specific neurectomy of the nerve that innervates the proximal suspensory ligament, as well as release of a fascial layer that surrounds the ligament in this area to relieve pressure on the swollen ligament. Preliminary reports from England show a very high success rate with horses that have chronic hind limb proximal suspensory ligament desmitis.

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Ligament injuries *continued*

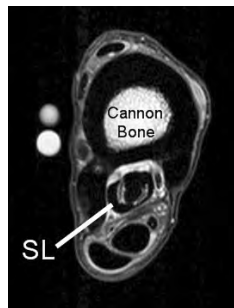
Another procedure that the WSU equine orthopedic team is clinically researching is the injection of stem cells from a horse's bone marrow into the injured area of the proximal suspensory ligament. Though not proven yet, bone marrow stem cells are thought to stimulate natural ligament regeneration that should more closely resemble the original tissue. A study is ongoing at this time to evaluate healing in the ligaments of research animals after stem cell injection using ultrasound and MRI.

"We are also treating some client horses with bone marrow-derived stem cells if the horse has a lesion that would be a good candidate for stem cells. At this time, we do not know how much stem cell injection will help these horses, but the potential to improve ligament healing is there," Dr. Sampson said. "The stem cells are obtained from the horse's own bone marrow, and then cultured for two to three weeks to obtain a large amount of cells. These cultured cells are then injected into the lesion using ultrasound guidance. This treatment is at the client's expense."

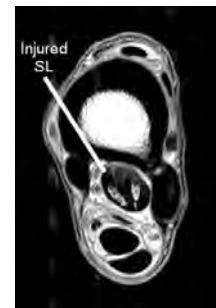
How does PSD occur?

"Horses can become injured over time as the small tears in the ligament continue to occur and result in more and more scar tissue in the ligament due to repetitive stress," Dr. Sampson said. "Injury can also happen in a single event, such as when a horse slides to a stop and an acute tear of the injury occurs, resulting in obvious lameness at that time. Often, we don't know how the injury initially occurred."

To make a diagnosis, veterinarians generally do a physical exam to watch a horse's gait and perform local nerve blocks to determine where the lameness is coming from. When lameness is localized, ultrasound is typically used to try to evaluate the proximal suspensory region. If ultrasound does not identify a cause of lameness, horses at WSU then have the option of undergoing an MRI, which is a much more sensitive imaging modality for ligament injury.



A magnetic resonance image (MRI) of a normal proximal suspensory ligament.



An MRI of an injured proximal suspensory ligament.

"The extent and type of injury can vary, and that, along with the client's input, determines what type of treatment we use," she said. "If a horse is not treated in some way, the horse has a much lower chance of healing to the point that it can return to use."

The Grayson Jockey Club Research Foundation has helped fund WSU's current stem research project for PSD, which should be completed by spring 2010. WSU is one of a number of institutions conducting equine stem cell research. Recent developments in stem cell treatments in horses have made big news by prompting research in human medicine regarding the treatment of Achilles tendon injuries.

For more information about these studies, or tendon and ligament injuries, contact Dr. Sarah Sampson at the WSU Veterinary Teaching Hospital at 509-335-0711.

Veterinary attention crucial in successfully transporting horses with fractures

Several types of fractures and injuries that doomed a horse in the past may be repaired today due to advances in veterinary medicine and surgery.

One of the most important factors for a successful outcome from such an incident is what happens before a horse arrives at a veterinary medical center for treatment. This includes applying appropriate first aid and stabilizing the limb properly if needed.

"What happens from the time a fracture is recognized to the time the horse arrives at the referral center is often as critical, or more critical, than what happens during the surgical procedure for fracture repair," said Dr. Kelly Farnsworth, a board-certified equine surgeon at WSU's College of Veterinary Medicine.

"I would discourage owners to try to do something alone unless they have a good understanding of the anatomy and the dynamic changes in forces that occur when the limb is fractured," said Dr. Stavros Yiannikouris, a WSU equine surgical resident with interest in orthopedic sports surgery and performance.

Signs of a fracture include sudden lameness, severe pain, swelling in the affected area, and a refusal to place weight on the

affected limb. Horse owners need to address an injury immediately once it is recognized. Ideally, they should keep the horse quiet to minimize additional tissue damage from the fracture, and contact their veterinarian or have someone else place the call. The horse should not be walked unless absolutely necessary. Walking on an unstable limb can cause additional damage to the leg. Care should be taken to the location of the horse unless the situation dictates that it is unsafe for the horse or those handling the horse to remain where they are.

"It is critical to protect the soft tissues that cover the bone so that the sharp ends don't further damage the soft tissue, nerves, and blood vessels in that area until we have a chance to repair the fracture," Dr. Farnsworth said. "A veterinarian can help with this critical first aid. If the fracture is open, meaning the bone has penetrated through the skin, our chances for successful repair decreases dramatically. And while success is still possible, extreme care should be taken to prevent this from happening."

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Transporting horses *continued*

“Once supportive first aid is applied, most horses should be transported to a hospital where quality radiographs or other advanced diagnostic modalities can be used to determine exactly the degree of damage,” Dr. Yiannikouris said. “A veterinarian should evaluate the horse before any plans are made for transportation. If a horse is not properly prepared for travel, the fracture can displace further and penetrate through the skin, which may affect the overall outcome significantly.”

Once a veterinarian has stabilized the broken leg, the horse can then be moved or transported. Ideally the trailer should be moved as close to the horse as possible, to reduce the distance the horse has to walk. If a horse falls while being loaded onto a trailer or on the way to the hospital, try to calm the animal and slowly help it up if possible.

Ideally foreleg fractures should be transported with the horse facing reward, and rear limb fractures with the horse facing forward. This way if the driver is forced to brake suddenly, the weight of the horse is not thrown onto the fractured limb. It is best to use a trailer that confines the animal and provides support on all four sides, rather than an open stock trailer. This allows the horse to lean against the walls and not be thrown around in the trailer. Horses with fractured limbs will not lie down in an open trailer. A large horse trailer is more stable than a small trailer, but if used, the horse should be confined to an individual stall within that trailer.

Contemporary treatments and recovery

There are several types of fractures that horses can survive with proper medical or surgical treatments. While the type of fracture plays a large role, the size and temperament of a horse are other factors that can determine success or failure.

“As far as other factors, skin lacerations or open fractures decrease the prognosis significantly due to infection,” he said. “Other detrimental factors include uncontrollable bleeding or any compromise in blood supply to the limb below the fracture.”

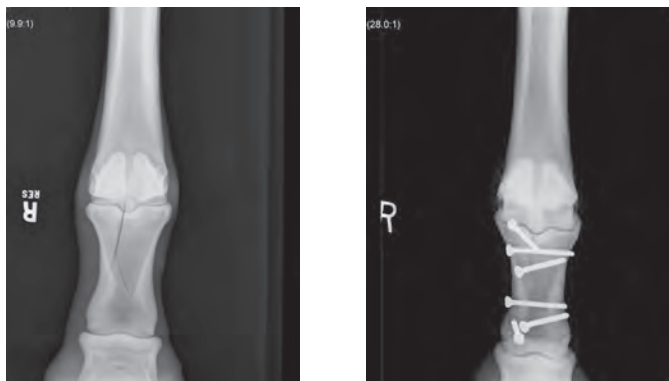
“In general, fractures below the carpus (knee) or hock can be managed in most horses,” Dr. Yiannikouris said. “In addition, olecranon (point of the elbow) fractures are usually easy to manage and have a favorable outcome. For fractures higher than that, usually weight is the limiting factor. Surgical repair of fractures in horses that weigh more than 600 pounds can be difficult, and in some cases impossible. High quality radiographs are critical before making any permanent decisions. Some humeral (shoulder) fractures, scapular fractures, femur fractures, and pelvic fractures can be managed with strict stall confinement with a successful outcome.

For most horses, surgical repair of the fracture offers the best prognosis for survival and return to soundness. Horses that come to WSU’s Veterinary Teaching Hospital for treatment have thorough diagnostic testing done before surgery is ruled an option. They are imaged with digital radiographs, and some with computer tomography or magnetic resonance imaging if needed, so veterinary surgeons know the exact configuration of the fracture and can make proper surgical planning.

“Horses with fractures that require internal fixation are put under general anesthesia, and depending on the fracture, may have as little as one screw placed or may have multiple plates and a multitude of screws put in to reconstruct the anatomic configuration,” Dr. Farnsworth said. Most also have casts placed on them for additional protection.

Preparing for an emergency

- Keep a first aid kit for a horse handy in a trailer or stall. Include sterile bandages if possible.
- Keep a cell phone and phone numbers for your veterinarian and nearest equine referral center handy in a stall, trailer, or vehicle.
- Know the location of the nearest equine hospital.
- Make arrangements for immediate access to a trailer if one is not owned, or if one is, make sure the trailer is licensed and ready to travel.
- Make plans for someone to drive to the hospital with you to help with directions, phone calls, unloading the horse, etc.



Radiographs showing the fracture of a horse’s P1 bone before and after repair at WSU’s Veterinary Teaching Hospital.

“Following surgery, horses with fracture repairs may be recovered in our recovery pool depending on the duration of surgery and fracture type,” he said. “This is a huge step forward in treating fractures because one of the most critical times for a fracture repair is the immediate post-operative period.”

Generally, a horse is disoriented when coming out of anesthesia. But the pool allows the animal to regain its senses and balance, decreasing the possibility of injuries from a stumble or fall. When ready, the pool floor is brought up under the horse, allowing it to walk to a stall right out of the pool.

After surgery, a fractured horse has to stay at the hospital for a period of time, especially if a cast is on. Once the cast is removed and the horse is using its leg, it can go home, but must follow a rehabilitation plan that usually lasts between three to six months, and in some cases, up to a year. A rehabilitation program may include initial stall rest, with a gradual increase in walking and physical therapy for the leg to regain its range of motion.

“Once a fracture occurs, or even if horse owners aren’t sure, we welcome them or their veterinarians to call us immediately at the veterinary hospital to get a consultation and to figure out the best course of action,” Dr. Farnsworth said. “With the modern treatments and surgical procedures we have today, we are able to save a large number of horses and return them to athletic function, while others are able to be comfortably used as brood mares or for lower-level athletic activities. It does have a significant financial and emotional commitment, but the results can be very positive.”

For a consultation, emergency services, or for more information, contact the WSU Veterinary Teaching Hospital 24-hours-a-day at 509-335-0711.

The WSU College of Veterinary Medicine Equine Team

The WSU Veterinary Teaching Hospital could not operate without the cooperation and dedication of its veterinarians, technicians, and other support personnel. The WSU equine team strives to provide every client with the best possible medical care for his or her horse. Below is a chance to get to know some of these people before you visit the hospital with your horse.

Equine Faculty

The **Equine Medicine team** provides an array of services for the diagnosis and treatment of a wide variety of horse diseases, including heart and lung disorders, colic, diarrhea, neurological diseases, neonatal intensive care, and infectious diseases. Our senior faculty member, **Dr. Melissa Hines**, is board-certified in large animal internal medicine by the American College of Veterinary Internal Medicine (ACVIM). This year marks the 20th year she has served horse owners at WSU. **Dr. Kathy Seino** is also a board-certified member of the medicine team. She is an assistant professor who specializes in neurological infectious diseases like West Nile virus and equine herpes virus, and has conducted extensive vaccine and immunological research into West Nile virus.

The **Equine Surgery team** is renowned for their expertise in lameness evaluation and laparoscopic surgery. They provide a comprehensive array of surgical procedures for many conditions including fracture repair, arthroscopic surgery, colic, urinary bladder disorders, upper respiratory abnormalities, and ovariectomies, to name just a few. Team members also perform high-speed treadmill testing. **Drs. Claude Ragle, Kelly Farnsworth, and Bob Schneider** are board certified by the American College of Veterinary Surgeons. Another key board-certified member of the surgery team, **Dr. Julie Cary**, is head of our emergency services at WSU. **Dr. Sarah Sampson** joined the surgery service in 2008 as a clinical instructor after serving four years as a WSU equine surgery resident. She was recently board-certified by the ACVS and specializes in equine orthopedic surgery, lameness diagnosis, and magnetic resonance imaging (MRI).

The **Equine Theriogenology** or reproduction service is led by **Dr. Ahmed Tibary**, our board certified and internationally renowned large animal theriogenologist. Dr. Tibary provides a diverse range of services for horse owners including breeding soundness evaluations of stallions and mares, pregnancy and fetal well-being evaluations, semen collection and freezing, embryo transfers, and artificial insemination with fresh-cooled or frozen semen.



Dr. Melissa Hines, DVM, Ph.D., Diplomat ACVIM
Associate Professor and Chief of the Equine Medicine Service
Specializes in immunology, infectious diseases, neonatology, and exercise physiology
Member of the WSU veterinary faculty since 1989
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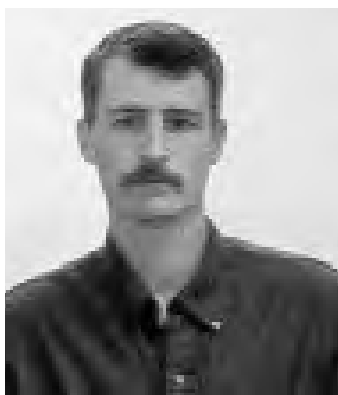
Dr. Kathy Seino, DVM, Ph.D., Diplomat ACVIM
Assistant Professor of Equine Medicine
Specializes in neurological infectious diseases and West Nile virus
Member of the WSU veterinary faculty since 2008
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Dr. Robert Schneider, DVM, M.S., Diplomat ACVS
Professor and Chief of Large Animal Surgery
Specializes in equine orthopedic surgery
Member of the WSU veterinary faculty since 1992
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Dr. Claude Ragle, DVM, Diplomat ACVS, Diplomat ABVP (equine practice)
Associate Professor of Equine Surgery
Specializes in minimally invasive surgery, laparoscopy, respiratory surgery, and gastrointestinal surgery
Member of the WSU veterinary faculty since 1992
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Dr. Kelly Farnsworth, DVM, M.S., Diplomate ACVS
Clinical Assistant Professor of Large Animal Surgery
Specializes in minimally invasive surgery, laparoscopy, and lower limb lameness
Member of the WSU veterinary faculty since 2002
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Dr. Julie Cary, DVM, M.S., Diplomate ACVS
Clinical Assistant Professor of Equine Surgery and Emergency Care
Specializes in equine emergency medicine and surgery
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Dr. Sarah Sampson, DVM, Diplomate ASVC
Clinical Instructor of Equine Surgery and Orthopedic Sports Medicine
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Dr. Ahmed Tibary, DVM, Ph.D., Diplomate of the American College of Theriogenologists
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WSU Equine Veterinary Technicians

Our registered veterinary technicians are the “nursing” staff of WSU’s Veterinary Teaching Hospital. They play a vital role in patient diagnostics and care, as well as in the education of veterinary students. Their dedication and caring is evident with every patient they assist.

Lethea Hunter-Russell is a licensed veterinary technician (LVT) that works with the equine orthopedic surgery service. **Molly Loaiza** is an LVT who works primarily with the equine medicine service. **Shirley Sandoval** (not pictured) provides primary support for large animal and equine theriogenology. **Teri Olson** is a LVT with advanced training in equine dentistry. She also helps the equine surgery service, and is an invaluable aid in evaluation and treatment of a variety of dental disorders in horses. In addition, **Rachel Jensen** is an animal health technician who helps with equine surgeries and emergency and critical care cases.

WSU Equine Support Staff

Many other individuals provide critical assistance in the day-to-day operations of the equine hospital. It is difficult to include everyone involved with the care and treatment of equine patients, but you may meet a few of these people.

Lynette Kinzer is our patient services coordinator at the large animal appointment desk, and the person you are most likely to talk to on the phone. Lynette helps clients make appointments, answers questions, arranges transportation to the hospital, and is a liaison between our doctors and clients. **Mike Carpenter**, **Rick Fredrickson**, and **Dane Anderson** are our full-time large animal care staff. They clean and maintain the stalls for patient care during hospitalization, maintain our paddocks, and work with the animals. Rick Fredrickson is also the shuttle van driver for equine patients traveling between Pullman and western Washington.



Front row, left to right: Patient services coordinator Lynette Kinzer, equine veterinary technician Molly Loaiza, and animal care assistant Brynna Coffman. Back row, left to right: animal care assistants Heidi Van Buren and Taryn McLaughlin, and equine veterinary technicians Lethea Hunter-Russell and Teri Olson. Right: Animal health technician Rachel Jensen.



Equine Support Staff (left to right): Kristi Uptagraff, Mike Carpenter, Rick Fredrickson, Dane Anderson, and Justin Welch.

2009 Equine Interns and Residents

The WSU equine section is staffed with many competent veterinarians who occupy a number of critical positions on our health care team. An important component of our team is our residents and interns.

WSU equine interns gain advanced training in equine medicine and surgery for one year under the mentoring guidance of WSU's senior clinicians. Clinical internships in equine medicine and surgery are offered at select universities and private practices throughout the United States and Canada and, as such, are highly competitive. WSU equine interns are chosen for their outstanding skills, abilities, and knowledge. They are involved in many cases that come through our doors and are crucial to the hospital's operation.

WSU Veterinary Teaching Hospital residents are veterinarians who have completed their veterinary degree and 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 specialty board certification with the American College of Veterinary Internal Medicine (ACVIM) or the American College of Veterinary Surgery (ACVS). 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 graduate research programs to enhance their competence as clinical scientists and future academicians. Meet our newest intern and second- and third-year residents.



Dr. Bradley Nelson

Dr. Nelson joined our team this summer as a rotating intern involving both equine medicine and surgery. He attended the University of Wisconsin-Madison and earned his DVM in May 2009. He is especially interested in equine gastrointestinal and orthopedic surgery, and lameness evaluation. Prior to graduating, he worked as a veterinary technician at the large animal hospital at the Veterinary Medical Teaching Hospital

at UW-Madison, and was involved with several research projects

and training veterinary students. He is working toward gaining a residency in large animal surgery with prospects of becoming board-certified by the ACVS. In the future, he plans to pursue an academic career within large animal surgery.



Dr. Siddra Hines

Dr. Hines is in the second year of her equine medicine residency. She is an alum of WSU, attending from 2000 to 2007, and earned her DVM from the College of Veterinary Medicine in May 2007. After graduating, she performed an internship in equine medicine, surgery, and ambulatory practice at the University of Missouri-Columbia before returning to Pullman in July of 2008 to join the WSU Equine Team as a resident.

Prior to her internship, Dr. Hines spent several years working in the WSU Veterinary Teaching Hospital as an equine emergency technician, and in other veterinary departments at WSU as a research assistant. Her future goals are to become board certified in equine internal medicine, attain a doctorate in immunology, and work in the field of academia as an equine medicine clinician or researcher.



Dr. Chad Marsh

Dr. Marsh is a second-year equine surgical resident. He joined our team in 2007 as an equine surgery intern, after earning his DVM from Texas A&M University. He has a special interest in equine sports medicine, and orthopedic and soft tissue surgery. Before coming to WSU, Dr. Marsh worked as a veterinary technician in equine surgery, lameness, sports medicine, drug testing, and radiographic evaluation

for several years, and has also been involved with competitive team roping. He is working toward becoming a board certified equine surgeon.

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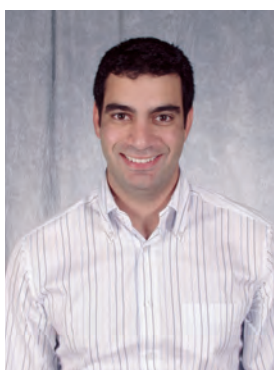
Interns and Residents *continued*



Dr. L. Nicki Wise

Dr. Wise is in the third year of her residency here at WSU. She earned her DVM from the University of Georgia in 2006, and was a large animal intern instructor at Texas A&M University. In July 2007, she joined the WSU equine team as an equine medicine resident and is currently participating in research involving the treatment of equine piroplasmiasis. Her goals are to become board certified and pursue a

career that encompasses clinical practice, teaching, and research.



Dr. Stavros Yiannikouris

Dr. Yiannikouris joined the WSU equine team in July 2007. He earned his DVM from the University of California, Davis in 2006, and completed an internship that focused on surgery, medicine, and anesthesia at the Rood and Riddle Equine Hospital in Lexington, Kentucky. Originally from Nicosia, Cyprus, Dr. Yiannikouris comes from a family-owned horse breeding and training Thoroughbred farm, and was an

exercise jockey in Nicosia. He also served as a second lieutenant in the Cyprus National Guard before coming to the United States. He gained experience as head barn nurse at the University of California, Davis equine barn during his college career. In the future, he plans to become board certified in equine surgery and work in a private surgical practice that focuses on racehorses.



Dr. Jacobo Sebastian Rodriguez

Dr. Rodriguez joined the WSU equine team as a large animal theriogenology resident in July 2007 and is in the third year of his residency. He earned his DVM from the National University of La Plata, Argentina, in 2000 and, until 2006, worked as a veterinary surgeon for Farm Santa Margarita in Buenos Aires, the largest quarter horse farm in Argentina. There he was involved

with reproductive procedures such as artificial insemination with fresh, cooled, and frozen semen and embryo transfer. He also completed an equine internship program at Chino Valley Equine Hospital in Chino, California, in June. His future goals are to become board certified in theriogenology and to enter into a master's or doctoral program to develop research skills.

WSU Veterinary Teaching Hospital Switchboard

Main Hospital Switchboard and Emergencies.....	509-335-0711
Equine Appointments	509-335-0711
Agricultural Animal Appointments (Non-Theriogenology).....	509-335-5377
Theriogenology (Equine and Ag Animal).....	509-335-0741
Small Animal Appointments.....	509-335-0711
Dean's Office	509-335-9515
VTH Fax Number	509-335-3330
Billing	509-335-0711
Pharmacy	509-335-0736
Pet Partnership Program	509-335-7347
Pet Loss Hotline	509-335-5704

Want to know more about our equine clinical services, research, and accomplishments, or receive our quarterly newsletter online? Visit the equine Web site at www.vetmed.wsu.edu/depts-vth/equine or the WSU Veterinary Teaching Hospital Web site at www.vetmed.wsu.edu.



Count Me In

It is our privilege and desire at WSU to provide the best veterinary care to the many formidable equine athletes and companions who are treated at our hospital. Through the generosity of many individuals who support quality health care and the WSU College of Veterinary Medicine's mission of teaching, research, and service, we are able to continue our work and plan for the future with confidence.

The largest part of what we do is made possible by the encouragement, collaboration, and financial contributions of our generous public. Through each thoughtful gift, WSU is making a difference in the lives of our students, the equine industries of Washington, and the region. These gifts enable us to greatly enhance the scope of our equine veterinary services and allow us to continue to provide world-class health care for horses throughout the Pacific Northwest.

We would be honored if you would choose to become a partner in the important work that goes on here. If you are interested in supporting the advancement of Washington State University's renowned equine medicine and surgery section, please contact **Dr. Richard DeBowes**, associate dean of veterinary development, at 509-595-8015 or debowes@vetmed.wsu.edu, or **Lynne Haley**, director of veterinary development, at 509-335-5021 or lhaley@vetmed.wsu.edu.