CELEBRATING 10 YEARS AT THE LEATHERDALE EQUINE CENTER 2007 – 2017
On October 15, 2007, the College of Veterinary Medicine hosted a grand opening event for the University of Minnesota Leatherdale Equine Center, welcoming nearly 1,000 horse lovers into the new $14 million, 50,000-square-foot facility on the St. Paul campus.

What a day! It was the culmination of years of planning, fundraising, and construction. A team of eight Percheron horses made a spectacular entrance, kicking off the festivities by breaking a ribbon to enter the Equine Center’s indoor arena. Speakers included the president of the University and the governor of Minnesota. A Star Tribune headline heralded the center as “the Mayo Clinic for horses.”

The facility was named in honor of Louise and Doug Leatherdale of Medina, Minnesota, who made a generous lead gift to the University of Minnesota to fund the center. Tad and Cindy Piper of Long Lake made the lead gift for the Piper Performance Clinic—now Piper Equine Hospital—a performance medicine and reproductive clinic. Other major gifts funded the Barenscheer Arena and Nutrena Conference Center—and later, the Dudley Barn, which opened in 2010. Donors stepped up to support nearly every part of the facility, including paddock fencing, horse stalls, exam rooms, and engraved bricks.

The Leatherdale Equine Center: dedicated to the health, well-being, and performance of the horse

BY SUE KIRCHOFF

Doug and Louise Leatherdale, Susan Hagstrom, and University of Minnesota President Robert Bruininks prepare to cut the ribbon at the Equine Center’s Grand Opening in 2007.
The building’s design created high-tech yet functional space for performance evaluations, lameness examinations, and reproduction therapies. With its indoor arena; digital radiography; computerized gait analysis and high-speed cameras to test for lameness; and access to bone, CT, and MRI scans, the center offered an unprecedented ability to detect subtle abnormalities affecting performance. A high-speed treadmill allowed a horse’s every breath and heartbeat to be monitored while galloping up to 30 mph. An aqua treadmill was available for rehabilitation.

The new facility represented the College of Veterinary Medicine’s dedication to an expanded equine program, including equine education for the next generation of veterinarians and a focus on equine research that would change the lives of horses worldwide. The center was positioned as a home for the region’s equine community, which would use the conference center and arena for meetings, seminars, and educational programs.

Ten years later, the Leatherdale Equine Center has exceeded those aspirations and more. Future expansions of technology and space are planned.
Equine education: training the next generation of equine veterinarians

BY SUE KIRCHOFF

The opening of the Leatherdale Equine Center demonstrated the College of Veterinary Medicine’s commitment to equine veterinary education and enabled the University of Minnesota to expand undergraduate, graduate, and continuing education opportunities through collaboration and partnerships within the University and the equine community.

The College of Veterinary Medicine’s equine curriculum includes third-year courses in equine medicine. An equine palpation lab provides hands-on experience in equine reproductive status assessment and disorders, and a course in neonatology offers instruction, emergency duty, and practical application of principles in evaluating and treating sick equine neonates and seasonal participation in clinically managing hospitalized foals.

In the fourth year of the curriculum, an equine track is available for students wishing to be strictly equine veterinarians, with equine rotations in dentistry and nutrition, lameness and podiatry, sports medicine, theriogenology, and ambulatory medicine.

For practicing veterinarians, continuing education provides opportunities for lifelong learning.

Being able to use the Dudley barn for students is huge.

Faculty members like Drs. Scott Madill and Erin Malone, who were with the College of Veterinary Medicine before the Leatherdale Equine Center was built, remember what it was like to teach equine medicine and surgery in the decades-old Large Animal Hospital. The Equine Center provided a new home for horses as well as students and teachers.

“Moving the teaching herd to the Equine Center was a big step forward,” says Malone, professor in the Department of Veterinary Population Medicine. An award-winning veterinary educator, Malone’s teaching areas include gastrointestinal, urogenital, respiratory, and equine limb surgery.

“Having the teaching herd at the Equine Center means we can care for the horses more directly and use them more readily when we have free moments to work with the students. Students have improved access for practice of physical exams and more exposure to the DVMs and other staff there.”

Malone also thinks the Dudley barn, a 14-stall facility constructed in 2010, was a great addition.

“Being able to use the Dudley barn for teaching is huge,” she says. “Having students work in a facility that resembles a typical environment—even if it is just getting used to stalls and horses in stalls—better prepares them for work in the community.”
A facility for education

BY KARIN WINEGAR

Hands-on experience, cutting-edge technology, and inspiring instructors are among the benefits of a University of Minnesota equine veterinary education. Alumni now in practice look back with gratitude at these and more aspects of the many relevant experiences and practical opportunities provided during training at the Leatherdale Equine Center (LEC).

State-of-the-art equipment, the arena for doing lameness testing, the advanced imaging capacities, and a design with horses in mind to limit further injury to horses and to humans—it is all there,” says Dr. Melanie Jackson, class of 2015, associate veterinarian at We Care Animal Hospital in Clintonville, Wisconsin.

“I really liked doing the emergency initial assessments,” she says. “Things happen in quick succession in a critical colic case, for example. I enjoyed figuring out whether you could medically treat it in the stall or if it required the surgery team. To assess and stabilize and then figure it out was fun.”

“The LEC staff is amazing, the technicians fantastic,” Jackson says. “They care about what they do and about all the animals that come through, and are always willing to help students, whether small-animal students doing required duties or fourth-year large animal students doing externships.”

“I found Dr. Madill very helpful,” she notes. “He would look at an ultrasound with me and explain things, and he has a good sense of humor. All the professors, teachers, and clinicians are the same way. They made sure we were learning and providing the best medicine for all our patients.”

Dr. Casey Rabbe, class of 2014, owns an equine ambulatory practice in Fairmont, Minnesota, and a small-animal practice in Ankeny, Iowa, where she lives with her clinic partner and husband, Dr. Dane Tatarniuk, a former LEC instructor in surgery and lameness.

“I use everything I learned at LEC,” says Rabbe. “In fourth year, I did several rotations through large-animal surgery and medicine and equine theriogenology (reproductive medicine), and also the lameness rotation. All of those skills we use every day in practice.”

Rabbe chose the University of Minnesota because “LEC definitely has a great reputation for clinicians and teachers,” she explains.

“I got a lot of one-on-one attention with LEC doctors,” she notes. “They were never afraid to take extra time with each student to teach new techniques. It was very hands-on: when we used an endoscope, Dr. Ward let me drive it, which taught me more than average practice would.”

The U’s research herd was particularly useful, she says, for instruction in theriogenology, vaccines, exams, and blood draws. “They are hugely valuable.”

Through Madill’s four-week reproduction classes, which utilized teaching mares, Rabbe says, “we practiced palpation every day, we bred them with semen we collected from a teaching stallion. We got to go through the entire breeding cycle.”

“The LEC was always amazing,” says Rabbe. “All the doctors knew your name, knew a bit about you, the areas you were interested in, and that meant a lot to me. I still call Drs. Ernst, Madill, Ward, and Trumble to consult on cases and to stay in contact. Not only are they great instructors, but I respect them as people.”

As a student, you don’t really realize how good you have it until you get out into practice or talk to students from other schools,” says Dr. Alex Bianco, class of 2011, who joined the College of Veterinary Medicine faculty as an instructor after completing her specialty training elsewhere. “As a student, you are much more influenced by the clinicians and teachers than you are by equipment or research.”

“As a fourth-year student, I was especially fortunate to have specialty, nonclinical rotations, such as lameness, rehabilitation, nutrition, and theriogenology, that helped me be well-prepared for an equine internship. The University’s philosophy of hands-on experience for students definitely figures into my post-graduation practice.”

Both as student and instructor in large-animal internal medicine, Bianco finds the LEC’s ratio of technicians to clinicians makes life easier.

“It allows everyone to spend more time discussing cases and teaching without worrying that patient care is suffering,” she says. “I feel very fortunate to have gone to the U as an equine-oriented veterinary student.”
Most of us have some experience with arthritis, whether we have it ourselves or have witnessed it in our loved ones. It’s usually considered a chronic, progressive disease, diagnosed when a significant amount of damage already exists and treatment can only help to manage the pain. But equine veterinarian and researcher Dr. Troy Trumble is investigating ways to diagnose and treat arthritis much earlier.

Trumble joined the College of Veterinary Medicine in 2007, the same year the Leatherdale Equine Center opened, and leads an active research program in equine osteoarthritis. He’s working to diagnose arthritis before damage has progressed to a chronic state—early enough that it can be effectively treated. His work has been funded by the National Institutes of Health and the National Football League.

The key, he believes, is biomarkers, metabolic byproducts of newly formed or recently broken-down components of the joint. Biomarkers can be measured in joint fluid, blood, and urine, and are accurate indicators of damage to cartilage or bone.

Finding the biomarker molecules that best correlate to early joint damage may one day help veterinarians make an early diagnosis of osteoarthritis and define the extent of the disease long before it can be seen on X-rays. Trumble and his team have studied more than 25 different biomarkers, investigating which ones correlate best to the degree of damage of specific structures in a joint with osteoarthritis.

In one of his most extensive studies, Trumble and his colleagues generated a model of mild osteoarthritis in the fetlock (ankle) joint by creating a small chip fracture. The chip mimicked a common, naturally occurring injury that often leads to arthritis in horses. Trumble found that the earliest occurring biomarkers are a response to the injury.

Trumble’s current goals are to refine the testing technology used for biomarker research and to use the biomarkers associated with early inflammation to determine whether commonly used arthritis therapies have the effect they claim to have.

“It’s critically important to have impartial research into these often expensive therapies,” he says. “The ultimate goal is to test all the commonly used joint therapies to determine which ones are best for different stages of osteoarthritis.” Trumble has also teamed up with other researchers to test newly developed therapies for arthritis in the horse.

Trumble and his team are making significant progress toward his vision of developing a panel of biomarkers that could be employed in the field, using a joint fluid sample that would indicate the stage of arthritis in an individual horse.

“Biomarkers can tell us a lot more than things like radiographs and the response to treatment,” he explains. “I could see using the results to indicate that, for one horse, option A might be best treatment, while option B would be the best treatment for another horse. Armed with the biomarker panel, a veterinarian could formulate an individualized plan for each horse they treat.”

This final goal may be a long way off, but Trumble asserts that osteoarthritis is more treatable than people think.
What is the role of genetics in health and disease? Researchers around the world are investigating this topic, with the goal of finding better ways to prevent and treat disease and promote health. Some of the brightest and most innovative equine genetic researchers are with the Equine Genetics and Genomics Laboratory at the University of Minnesota Leatherdale Equine Center.

Led by College of Veterinary Medicine faculty member Dr. Molly McCue, the laboratory uses advanced technologies to better understand equine health and biology and to study genetic disease, physiological variation, and genetic diversity in horses.

The laboratory is exploring the genetic aspects of at least a dozen different diseases, including equine metabolic syndrome, polysaccharide storage myopathy, recurrent exertional rhabdomyolysis (“tying up”), equine recurrent uveitis, grey horse melanoma, and osteochondrosis.

The lab’s work in equine metabolic syndrome, a hormone problem linked to obesity, insulin resistance, and laminitis, has identified at least six different genes that probably affect risk. One of their projects aimed at functionally prioritizing the genes and alleles for metabolic syndrome was recently funded by the U.S. Department of Agriculture’s National Institute of Food and Agriculture.

Another major grant from the U.S. Department of Agriculture is providing support for the team’s efforts to create tools to link phenotype to genotype in the horse.

“Linking a horse’s genotype to its phenotype would identify the molecular basis for desirable traits, get insight into physiology and pathophysiology, and find new approaches to disease prevention and therapy,” McCue says. The researchers’ long-term goal: to facilitate genome-mapping efforts in the horse and provide tools to expedite the identification of the genes and alleles underlying multiple phenotypes.

And the impact of the team’s research won’t be limited to horses. While some aspects of their work are equine-specific, the computational tools can be extended to other species. Using the horse as a biomedical model, the team’s ultimate goal is to improve the health of companion animals, livestock, and humans.
Improvements keep hospital at the cutting edge

BY KARIN WINEGAR

A decade after the Percheron team burst through the yellow ribbon launching the University of Minnesota Leatherdale Equine Center (LEC), veterinary students and staff are enjoying additional equipment, opportunities, and techniques that further the training of equine veterinarians and increase the odds of easier, swifter diagnosis and precise treatment.

What’s new at the LEC and its Piper Equine Hospital? A great deal, including a choice of MRIs, a neonatal ICU, a new mobile app that determines ideal horse weight, and research that pairs correct feed to specific diseases. For the equine students, there is also a training area open 24/7 near their classrooms.

“We’ve really ramped up clinical skills teaching and offer more hands-on skills opportunities,” says Sally Lightner, laboratory services coordinator for Dr. Erin Malone, the director of the College’s clinical skills program. “In the past, students learned skills during lab but didn’t have any way to practice. Now they have The Practice Zone.”

Created in 2015, The Zone has surgery tables, an anesthesia machine, small animal models, and a model horse head that allows students to practice eye and nose treatment, including lacrimal duct flushing and nerve blocks. Its centerpiece is “Princess Neigha,” an equine model complete with intestinal and reproductive tracts. Unlike real horses, the Princess tolerates hours of poking, palpating, and puncturing without kicking, biting, or flinching.

Two new MRIs offer horse owners, students, and staff exceptional versatility: the standing MRI captures hoof, pastern, and fetlock images while the 3T MRI adjusts higher to cover hocks and knees. In addition, a CT scanner allows greater accuracy than radiographs in the diagnosis of conditions of the head, teeth, neck, and the rest of the body in smaller patients such as foals.

“MRIs give us data we wouldn’t be able to get otherwise, because we can’t ultrasound down into the foot successfully, and X-ray only gives bony tissue, not soft-tissue information,” explains Sue Loly, certified veterinary technician working with surgeon Dr. Nicolas Ernst. “They are especially good for finding deep tendon and ligament lesions. And our new computed tomography system is helpful to examine bony detail like the cervical spine, and sinuses and teeth in the equine head.”

The standing MRI requires only a mild sedative, is the only one in the state, and draws clients from the Midwest and Canada, says Loly. “We have not had an undiagnosed case yet in the standing MRI—a great success rate!”

A new neonatal ICU has specialized monitoring equipment and a crib area so nursing and medical care can take place while mares stay in contact with foals. This allows intensive monitoring and specialized care of sick foals around the clock. The hospital’s new, extra-long gastroscope provides remarkable image quality, allows standing stomach exams of even the largest horses, and is portable for field use when needed.

Meanwhile, a new wireless telemetric ECG unit allows clinicians to evaluate the electrical activity of a horse’s heart. A horse with severe arrhythmia, for example, required intensive care and telemetric monitoring. Once it recovered, staff used the equipment to perform a stress test to ensure it had normal rhythm before returning safely to work.

“We use telemetry in the arena, on the treadmill, and for 24-hour monitoring of sick horses in their stall,” says Dr. Anna Firshman, associate professor of large animal internal medicine in the Department of Veterinary Population Medicine. “It’s used for clinical cases and teaching, and allows us to provide state-of-the-art care for cardiac disorders.”

All of these and more improvements enhance the U’s veterinary education. As Firshman says, “better facilities equal better learning, and happier horses equal safer learning.”

Eileen Kuhlmann works with veterinary student Marie Gilbertson to place a jugular catheter in “Princess Neigha,” a horse teaching model.

Photo by Sue Kirchoff

Sue Loly performs a standing MRI on an equine patient.
Encouraging a foal’s will to live

BY MARTIN MOEN
PHOTOS BY PETER CONWAY

It’s no exaggeration to say that Ghazillionheir CA is like a cat with nine lives. The 4-month-old Arabian foal is defying the odds.

To start with, he’s the product of 20-year-old semen. Add in his difficult journey to good health, and it is remarkable to see him thriving at his mother’s side in a stable at Conway Arabians outside Chatfield, Minnesota.

“He just didn’t look right,” is how owner Lori Conway remembers Ghazillionheir CA’s first few days after birth in June. “You could tell he didn’t feel well—wasn’t eating or as active as we like our new foals to be.”

Three days after his birth, Conway decided to bring the foal to the Piper Equine Hospital at the University of Minnesota College of Veterinary Medicine’s Leatherdale Equine Center. The foal and his dam were quickly loaded onto the trailer the Conways have prepped and ready to go for emergencies like these.

“The 100-mile journey would be hard on him, but I didn’t see any other choice,” Conway says. It proved to be a wise decision.

Conway Arabians has been bringing their more challenging cases to the Piper Equine Hospital for five years. The farm currently has more than 150 horses and saw a record 23 foals born in 2017—double their usual birth rate. The farm is recognized as a premier breeder of Arabian and half-Arabian horses in North America.

“Our foals are incredibly valuable,” says Lori’s husband, Peter, who purchased his first Arabian more than 25 years ago. “In our business model, we need successful pregnancies and great medical care. And we get that from our local veterinarians as well as the team at Piper Equine.”

When Ghazillionheir CA arrived at Piper Equine Hospital, Dr. Anna Firshman, associate clinical professor in large animal internal medicine, and her team noted his critical condition. After initial tests and imaging, abdominal surgery was deemed necessary. Led by Dr. Francisco Rodriguez, the surgical and anesthesia team removed five feet of dead intestine, presumed to be due to severe enteritis.

“This condition isn’t uncommon,” Firshman says, “but you don’t often see a positive outcome. He definitely has a strong will to live. Getting him here so quickly and rapidly instituting specialized treatment likely saved his life.”

Ghazillionheir CA spent 11 days in the hospital as staff treated him aggressively to prevent infection and improve his compromised health. Large animal resident Dr. Brittany Welch, veterinary students, and technicians made sure he received the best possible care.

Firshman says it is partnerships like these—dedicated owners, experienced local veterinary care, and high-level expertise at a regional medical center—that ensures a strong future for Minnesota’s equine community.
West Metro Equine Practice: there for horse owners 24/7

By Sue Kirchoff

When horse owners in the area west of the Twin Cities need care for their horse, many rely on West Metro Equine Practice’s ambulatory medicine team to be there, 24/7.

The West Metro team—Drs. Brady Bergin, Kerry Kuhle, and Sara Wefel—provides everything from vaccinations and blood testing to dentistry and upper airway endoscopy. They respond to emergency calls and conduct lameness evaluations, reproductive ultrasounds, and minor field surgeries. Cases that require inpatient or specialty care are referred to the team of board-certified equine surgeons, internists, reproductive specialists, ophthalmologists, cardiologists, dermatologists, radiologists, and other experts at the Piper Equine Hospital.

The team also provides a two-week equine ambulatory clinical rotation for fourth-year veterinary students. Students join the clinicians on farm calls and follow-up visits, with student and practitioner discussing cases as calls are made.

“We enrich the students’ experience by providing hands-on training whenever possible and incorporating students into the diagnostic workup and treatment plan for every case we see,” says Bergin. “We believe this rotation should be the most practical part of each student’s veterinary education and help prepare them to go straight into practice after graduation.”

Bergin considers the center’s 2016 acquisition of a standing MRI a “game-changer,” thanks to donors Bill Dudley and Cindy Piper. It offers a huge benefit to clients, he says, because horses can now get an MRI under mild sedation at the Piper Equine Hospital rather than undergoing general anesthesia.

“I have a lot of pride in this service,” Bergin says. “We have a good team; our clients recognize and appreciate what we do; our communication and ease of collaborating with specialists is seamless; and students value and enjoy learning what we have to teach.”
When it opened in 2007, the Leatherdale Equine Center (LEC) represented a great leap forward in terms of quality and expanded capacity for equine teaching, clinical service, and research at the University of Minnesota College of Veterinary Medicine. Continuous improvements in the decade since have kept the facility and its programs at the forefront of national and international expertise. But what comes next?

We have established areas of expertise and are positioned to build on that expertise. Success will require a focus of effort and resources. Here is the equine program’s plan.

1. **Value-added, practice-ready graduates.** Our equine-track graduates are very successful in obtaining high-quality practice jobs and internships. Our curriculum provides opportunities for students with an equine interest to take courses and clinical rotations, such as Equine Lameness and Podiatry and Equine Sports Medicine, that introduce value-added skills and knowledge beyond what are considered entry-level. Our hospital’s urban setting and referral caseload make the current and future challenge one of ensuring adequate exposure to more basic activities such as castration, wound management, and developing vaccination and parasite control programs.

   - **Our West Metro Equine Practice** has gone a long way toward meeting these needs. However, its capacity is limited by vehicle access and a very small office without a conference room and projection equipment. **Expansion of resources at West Metro** will improve student education and provide a way to offer continuing education opportunities to west metro horse owners and practitioners. The needs include an additional practice truck, a larger office space with a conference room capable of hosting classes and continuing education events, and the capacity to provide oversight housing so students can be more involved in emergency cases.

   - Other educational program needs include **scholarships for equine-track students** and ongoing support for the **equine teaching herd**, a costly but critical tool in our teaching program (see also below in research).

2. **Expansion of our equine sports medicine program.** The LEC was designed to support an active equine sports medicine and rehabilitation program, with an arena, land and water treadmills, and an advanced gait-analysis system. Several faculty members have developed successful research programs in this field, including diagnosis and treatment of osteoarthritis in its early stages, and definition of the equine genome, with a goal of explaining the cause of many conditions that limit equine performance. We are ready to expand the program to the next level but need additional components.

   - Our greatest need is an **endowed chair of equine sports medicine** that can focus his or her efforts on expanding research and clinical applications in sports medicine and rehabilitation. This chair will require **additional support** in the form of graduate students to staff a research program, availability of funding and horses for pilot projects, staff to assist with clinical cases, and potentially some facility modification to make case care more efficient.

   - Teaching students and maintaining an equine program requires access to quality multi-use horses. We need to enhance and expand our **teaching herd with horses that are suitable for equine research**.

3. **Critical care and emergency medicine.** The LEC offers the Upper Midwest a unique suite of specialists with expertise in all areas of emergency and critical care medicine, including board-certified internists, surgeons, anesthesiologists, neurologists, ophthalmologists, oncologists, and pharmacists. In some areas, however, our facilities are lacking.

   - **A new isolation facility at the LEC** is needed to optimize patient care and efficiency. The existing isolation unit at the old Large Animal Hospital is small, cannot accommodate animals that require sling support, and is inefficient for patients, clients, and staff because it is located several blocks away from the LEC.

   - The **facilities for neonatal foal care at the LEC** require significant upgrades to match our state-of-the-art patient care capabilities.

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If you are interested in supporting our equine education, research or clinical services areas, please contact:

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