HORSE HEALTH LINES

University of Saskatchewan

WESTERN COLLEGE OF VETERINARY MEDICINE

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GIFT HORSE

THE VET BEHIND THE POWERFLOAT

SURGERY AN OPTION FOR PPID?

TOWNSEND EQUINE HEALTH RESEARCH FUND

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With help from a young visitor, WCVM student Moniek Okkema bandages a front limb on the WCVM's simulated horse during the Saskatchewan Equine Expo.

Christina Weese

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Christina Weese

SURGICAL SOLUTION FOR PPID?

By Christine Barakat and Mick McCluskey

A Canadian researcher is working to develop a surgical technique that could, one day, provide a long-lasting fix for pituitary pars intermedia dysfunction (PPID) in horses.

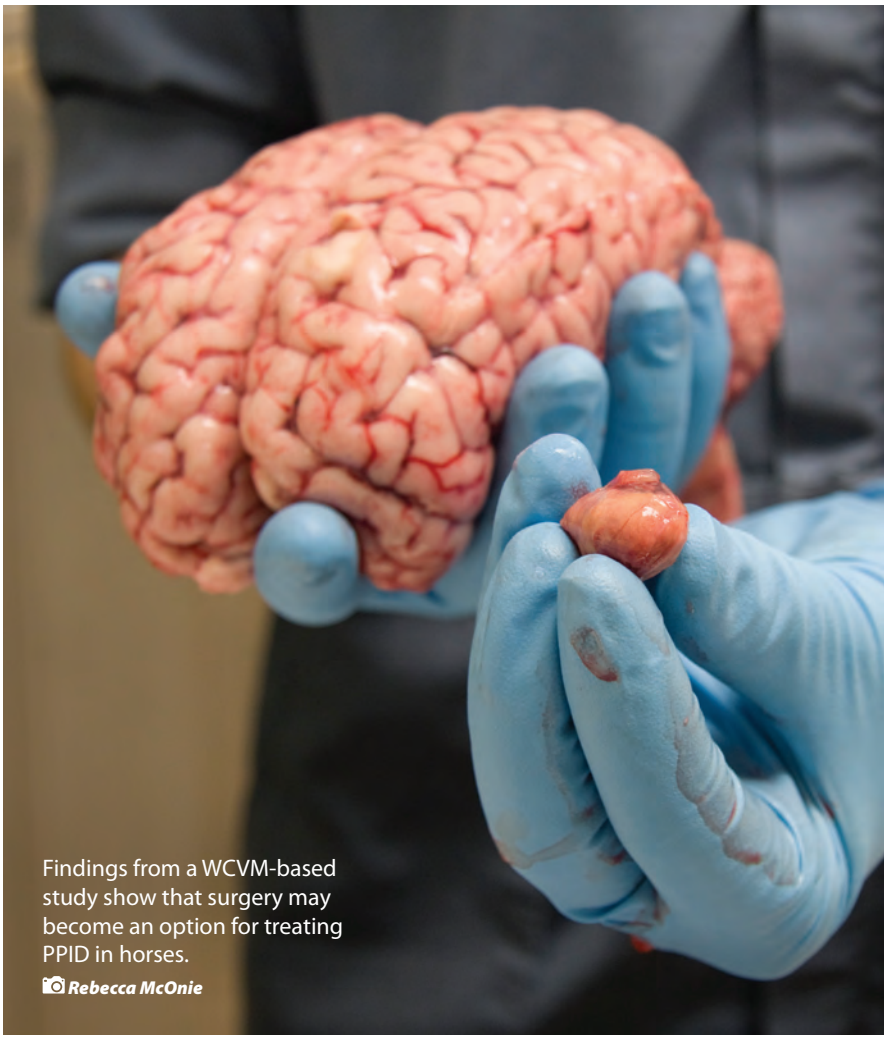
PPID, also historically known as Cushing's disease, occurs when a part of the pituitary gland called the pars intermedia becomes enlarged and secretes excessive levels of adrenocorticotrophic hormone. The body reacts to this excess by exhibiting a variety of clinical signs, including a long, persistent hair coat, increased sweating and muscle wasting. Although considered a disease of older horses, PPID can develop in those as young as 15.

A medication, pergolide, is effective at controlling PPID, but must be given daily for the duration of the horse's life. "The cost of this daily pill adds up, and the time, effort and stress of medicating this horse, when objectively viewed, is also not substantial, says Dr. James Carmalt, a professor of large animal surgery at the Western College of Veterinary Medicine (WCVM).

Looking for an alternative, Carmalt has been experimenting with surgical techniques that remove or disable the diseased tissue in the pituitary gland. Although this is a novel concept in equine medicine, similar surgeries have long been used to control Cushing's disease in people and dogs.

So far, says Carmalt, the technique showing the greatest promise for PPID horses involves threading a catheter through the blood vessels of the face to reach the pituitary gland. "The pituitary gland sits, like an island, in this blood-filled sinus which can be thought of as a lake," says Carmalt. "If we pass a needle up an emissary vein into the lake, we can approach the island and direct a needle into it."

With access to the gland, Carmalt says, a surgeon can inject a substance to shrink it, reducing the amount of tissue available to secrete hormones. This, he adds, would be safer than excision because of the difficulty in accessing the pituitary gland as well as its delicate nature.



Findings from a WCVM-based study show that surgery may become an option for treating PPID in horses.

Rebecca McOnie

"Given that we do not have the tools to guide the needle into only the abnormal tissue of the pars intermedia, it seems safer to deliver something into the entire gland, which in PPID will primarily be the enlarged pars intermedia, rather than try to cut a portion out," he says. "It is important to remember that the other portions of the pituitary gland contain cells that are producing hormones critical to the long-term well-being of the horse."

Carmalt says much work still needs to be done, but he's confident a reliable technique can be developed. "I think that within 10 years, we'll have something that is working," he says.

Horse owners might be reluctant to opt for brain surgery as a treatment for PPID, acknowledges Carmalt, but a thorough explanation of the procedure could help them see the benefits. "It is scary, but to be honest, if it is explained — like passing a catheter into a vein (which horse owners see all the time), only this vein leads to the brain — then it seems less invasive. There is a tiny incision in the side of the face and the rest of the stuff is done using advanced guidance systems."

Carmalt adds that the costs and labour savings may also be significant. "We consider that we can make this is a one-time intervention that will be the same cost as a year of daily medication," he says. "There is envisaged to be no further cost, no stress associated with daily medication and no additional effort required for horse owners to enjoy their senior equine companions.

"Ultimately, of course, the remaining abnormal cells left within the pars intermedia will result in a recrudescence of clinical signs; however, by this time the horse may have succumbed to old age rather than the complications of having PPID — such as laminitis."

Reference: Carmalt JL, Scansen BA. "Development of two surgical approaches to the pituitary gland in the horse." *Veterinary Quarterly*. Dec. 2017.

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Gift Horse

By Jeanette Neufeld

A group of first-year veterinary students gather around a life-sized black plastic horse, holding up what looks like a large piece of intestine. "Wow! Cool!" exclaim several students as Dr. Julia Montgomery demonstrates the digestive system inside the equine model. This isn't just any horse. It's an advanced equine simulator, made possible by a $50,000 donation from the Equine Foundation of Canada (EFC).

Montgomery is an assistant professor of large animal medicine and a board-certified specialist of large animal internal medicine at the Western College of Veterinary Medicine (WCVM). The students pepper her with questions as they feel inside the model to understand how the internal organs fit together.

The students are clearly having fun while learning, as they continue to discuss how the model translates information from their lectures and textbooks into a three-dimensional space.

This is the first time that Nicole Sheedy has seen the horse. The first-year student is impressed by how quickly it helped her make sense of the information that she learned in class.

"I feel like I understand everything better," she says. "In order to do anatomy, you need to see it in 3D. Because I saw it in 3D, I automatically get the concept."

The model is an important bridge between lecture and live patient, and the potential for its use will only increase as more faculty members incorporate the equine simulator into their teaching.

Montgomery is enthusiastic about the myriad of possibilities the model presents.

"I think she's really amazing," says Montgomery. "It's not exactly the real thing, but it opens up invasive techniques to larger numbers of students. That adds really great value."

Her first-year class is using the model horse to better grasp anatomy concepts. Montgomery has also used it for third-year students as they work through colic scenarios. She anticipates fourth-year students, interns and residents could use the model to simulate working up a complex problem in a real-life case at the WCVM Veterinary Medical Centre.

Students from Saskatchewan Polytechnic will also use the model as part of their registered veterinary technologist (RVT) training. It could even serve as a refresher for staff and faculty as well as a tool to provide public outreach and education. Throughout the year, the model will receive visits from members of 4-H clubs, horse clubs, science camps and equine groups.

"I think the fact that people are generous enough to give us these donations — that they care about horses and equine health — is what enables us to have the kind of equipment and infrastructure that we have. And without that part of it, there would be a lot of things we wouldn't have. I'm eternally grateful, and I think it's fabulous," says Montgomery.

The decision to assist the WCVM in the purchase of the gift was an easy one, says Bob Watson, EFC president.

"It's our mandate," he says. The organization, which bears the slogan "people helping people helping horses," has made many donations to the five Canadian veterinary colleges since it was founded nearly 40 years ago.

"We thought it was a really good thing to invest in, that we could help a whole lot of people with that. Every student that comes through is going to work on that animal sometime in their program, even if they're not going into equine medicine," says Watson. "The equine people in particular are going to spend a lot of time with it, and they're going to find it fabulous because the models are just so lifelike."

The horse joins a growing stable of high-tech tools at the BJ Hughes Centre for Clinical Learning, which opened its doors in September 2016. This includes model dogs that can help simulate surgical techniques, as well as Agnes, a life-sized cow and her calf that are used to familiarize students with different calving scenarios.

The cow-calf and horse models all came from Calgary-based Veterinary Simulator Industries that got its start in part through support from EFC. The company builds a variety of simulation tools that can help augment the use of live animals in teaching situations.

"They're just a really marvelous learning tool," says Watson.

The list of uses for the equine model is extensive. Students can use it to practise everything from very basic halter and handling skills, to administering eye medications, catheter placement, intramuscular injections and rectal exams. The horse comes with three sets of ovaries modelling different reproductive stages so users can understand what each phase of equine ovulation feels like during a vaginal exam.

The horses' right front limb is an X-ray model that students can use to practise taking radiographic images. They learn how to hold the instrument at the proper angle and where to aim the X-ray beam.

"We're covering all the bases, from first year to the advanced study," says Carolyn Cartwright, manager of the BJ Hughes Centre for Clinical Learning. She's also an RVT and veterinary technician specialist in anesthesia.

She says that using the models takes away some of the pressure of working with a live animal. Students have 24-hour access to the facility, which allows them to hone their skills until they feel confident.

Third-year student Christine Reinhart says she wishes the simulation facility had been available during the earlier years of her veterinary education. She recently used the equine model in a third-year equine surgery class.

"We used it for the colic situation, which is an emergency situation for horses. Even if we see a colic in the college, it is an emergency. We might not get a chance to actually feel what it feels like. When they can set up a situation and it's very low stress, you can get a really good learning experience from it," she says.

The students who have used the equine model so far are grateful for the EFC's donation to enhance the simulation centre.

"I think this gift shows that WCVM has a really strong relationship with the community and that they think our initiatives are important and worth investing in," says Reinhart.

Sheedy echoes this statement.

"I feel happy that there are organizations that are willing to support us," adds Sheedy. "I want to say thank you."

Dr. Julia Montgomery teaches students using the new equine model.

Dr. Dennis Rach (WCVM '70) holds an example of his invention.
Christina Weese

THE VET BEHIND THE POWERFLOAT

By Lynne Gunville

Ask any horse owner or equine veterinarian about the PowerFloat, and they'll tell you that the rotary dental instrument is synonymous with equine dental care — an essential tool that's well known in the horse community.

The PowerFloat was the brainchild of Dr. Dennis Rach, a Calgary-based large animal veterinarian who has always liked solving problems.

Rach has been practising veterinary medicine since 1970, and he still loves his job – the animals he treats and the people he meets. As he points out, he's happiest when he's driving around the Alberta countryside on farm calls.

"I think a large animal practice is kind of fun," says Rach. "I'm primarily a country call person. I get to do a whole variety of things every day, and I'm lucky because I get to deal with people who have a livestock or animal background and are knowledgeable."

Rach grew up on a mixed farm north of Calgary, Alta., but he wasn't sure what to do with his agricultural background until he watched the local veterinarian conduct a post mortem examination on a steer. Greatly impressed by the science involved, Rach decided veterinary medicine was the career for him.

After his graduation from the Western College of Veterinary Medicine (WCVM) in 1970, Rach was the third veterinarian hired at Moore and Sturm Veterinary Clinic, a large animal clinic that served the Calgary area.

Today he's a partner in the highly esteemed practice, now named Moore Equine Veterinary Centre. While Rach is a certified equine chiropractor and certified equine acupuncturist, he's best known for his skill in equine dentistry — an area that's always been a special interest for him.

"I always tried to do a good job doing dentistry," says Rach. "The horse has to eat, and its teeth are extremely important, so I never took the easy route, even in the day when you hand floated and it was hard work. I hand floated for 25 years."

Over the years as he ran into difficult cases, Rach began to look for an alternative to the equine hand float – a tool that could cause soft tissue damage and premature loosening of the teeth. When he encountered a very skinny mare with a mouth that "looked like the Rocky Mountains," Rach set his problem solving skills to work.

Rach borrowed a rotary tool from a machine shop, constructed a plastic guard for it and successfully floated the mare's teeth in just a few minutes.

With that success under his belt, Rach made further improvements to the tool and had a stainless steel guard made for it. As other veterinarians heard about his device, they began to put in orders for the tool, and Rach's invention became known as the Rach Grinder.

But Rach wasn't satisfied yet. After several years of modifying and improving the tool, he patented and then introduced his product, the PowerFloat, at the annual meeting of the American Association of Equine Practitioners (AAEP) in 2000.

Although the initial reaction of the practitioners was lukewarm, the PowerFloat proved to be a huge hit at the AAEP's trade show the following year.

"It was like selling hot dogs," Rach recalls. "There were so many people lined up to get into the booth that I went to lunch and couldn't get back in."

Rach created PowerFloat, a company that now includes four full-time employees and uses machine shops in Calgary, Ontario and Nevada. The product is distributed by veterinarians in North America as well as Australia, Mexico, Europe and Chile.

While Rach enjoys his role as "the R and D guy" and is continuously inventing more products aimed at improving equine dentistry, he particularly relishes the chance to conduct wet labs aimed at teaching how to use the PowerFloat.

"We go to places that have rescue horses or something where they're not getting their teeth done otherwise, and the whole place gets their teeth done for nothing," Rach explains. "It's very gratifying to see the confidence of the veterinarians change. They'll take six horses, and they'll go from being tentative and not very confident to getting extremely confident by the time they leave. That's what I find exciting."

While his business keeps him busy, Rach still enjoys his role as a large animal veterinarian. Although half of his time is spent treating lameness, he finds dentistry work to be the most rewarding aspect for him.

"You can look in the mouth and see a mess, and you can just fix everything and make the horse a lot better, and you can walk away every time and know that you've helped the horse. It's immediate satisfaction."

As Rach has developed new techniques and tools to improve equine dentistry, he's endeavoured to share his knowledge by working with students at the WCVM as well as the veterinary schools in Calgary and Guelph. He's also helped create the International College of Veterinary Odontology, a networking information society aimed at increasing and passing on knowledge about equine dentistry.

Although he still enjoys working six days a week, Rach has slowed down in the last year. He took some extra time off last winter to travel with his wife Diane, who recently retired from her career as a midwife. The couple have three grown children.

As Rach looks back over a career that has spanned five decades, he observes that veterinary medicine is a humbling experience where you're just trying to work on things and make them better, and it's an uphill battle in many cases.

He's proud that the veterinary profession has made so many advances in dentistry over the past 20 years, and he feels a deep satisfaction that he was able to contribute to those advancements.

"You can look in the mouth and see a mess, and you can just fix everything and make the horse a lot better. You can walk away every time and know that you've helped the horse. It's immediate satisfaction."

- Dr. Dennis Rach

"Developing the tool [PowerFloat] was something that I couldn't let go of. There was a problem, and I couldn't let it go until I'd solved it. Seeing things get better is really important to me. And I think that's the really rewarding part of being a veterinarian — when you go out and look at an animal and there's something wrong and you can correct it."

Veterinary student Samantha Deamel uses a PowerFloat to treat Jim, one of the WCVM's equine patients.
Christina Weese

FIRST AID, equine style

By Dr. Suzanne Mund

Anyone who's been around horses knows they're accident prone and susceptible to problems such as colic and choke. If you're a horse owner, knowing first aid can help you to prepare yourself and your animal for the veterinarian's arrival.

How can you prepare for emergencies?

- Practise examining your horse so you become familiar with the process and can report the vital signs to your veterinarian in an emergency. Remember to conduct an exam only if it's safe to do so.
- Check the temperature using a rectal thermometer. Normal body temperature is between 37.5 and 38.5 degrees.
- Determine the heart rate using a stethoscope to listen behind the left elbow. The normal rate is 20 to 45 beats per minute (bpm). Using your fingers to palpate the facial artery and find the heart rate can be tricky, so practise on a normal, healthy horse in advance.
- Determine the respiratory rate by counting the breaths while watching the flank. The normal rate is 8 to 12 bpm.
- To check for shock, assess the capillary refill time (CRT) by pressing your finger on the mucous membrane or the gums. The CRT should be less than two seconds, and the mucous membranes should appear pale pink and moist.
- Listen for gastrointestinal sounds (GIT). One sound every two minutes is normal. Use a stethoscope or listen with your ear to each of the four quadrants: upper and lower left and right flanks.

Prepare a first aid kit

You can buy a first aid kit online or put one together using supplies available at your veterinary clinic. Include these items:

- Your veterinarian's contact numbers
- A stethoscope
- A thermometer
- Scissors and bandaging supplies such as non-adherent bandages, plain gauze, Vetrap, quilts and polo wraps
- Absorbent pads (or baby diapers) for stopping bleeding
- A flashlight with a fresh set of batteries
- Wire cutters
- Keep these supplies in a clean bucket that can be filled with fresh warm water when your veterinarian arrives.

Prepare transportation

If referral is an option for you, be sure your trailer is in working order and have your truck ready for emergency transportation.

Colic

A colicky horse may be pawing, stretching out, looking at its belly and lying down and rolling. Call your veterinarian if you see a horse that stretches out longer and appears to be straining to urinate – that's a common indication of mild colic.

What to do:

- Conduct a physical exam but only if it's safe
- Call your veterinarian. If advised to do so, administer a non-steroidal anti-inflammatory drug (NSAID) such as flunixin meglumine (Banamine) by squirting it into the mouth
- Remove feed but make sure there's access to fresh water. You can walk your horse if it's quiet, but if it is trying to roll, it may be best to put your horse in a larger paddock and wait for your vet
- Prepare a well-lit place out of the wind for the veterinarian to work
- Have a bucket of warm water ready for inserting a nasal gastric tube

What not to do:

- Never inject Banamine into the muscle. It can cause a complicated bacterial infection
- Don't attempt to give mineral oil orally. It can be aspirated into the lungs causing aspiration pneumonia – a serious, untreatable condition
- Don't perform a rectal exam. Leave that to your veterinarian who's trained to perform the procedure without causing a rectal tear

Lameness

The animal refuses to put any weight on a leg and may sometimes touch only the toe tip on the ground. The limb may be hot and swollen.

What to do:

- Call your veterinarian who may recommend a specific dosage and administration method for an NSAID such as phenylbutazone (Bute)
- Conduct a physical exam
- If the horse can walk, take it to an area with electricity in case X-rays are required

What not to do:

- Don't force the horse to walk. Stay with it and keep it quiet
- Don't attempt a splint without your clinician's guidance
- Don't try to dig out a hoof abscess on your own. Your clinician can use X-rays or hoof testers to locate the abscess and may recommend soaking the foot for a day or two before digging it out

Equine choke

This condition results from an esophageal obstruction that prevents swallowing. You may see feed material at the nostrils or excessive salivation. The animal may be making a stretching, gagging motion that looks as if it's trying to burp.

What to do:

- Conduct a physical exam
- Call your veterinarian
- Move to a safe, quiet, non-distressing place. Although a horse will sometimes relax enough that the choke resolves on its own, your clinician should still come out and pass a tube to completely resolve the obstruction

What not to do:

- Don't encourage the horse to eat. Remove all feed and water
- Don't try to administer mineral oil – it may cause aspiration pneumonia

Wounds

The wound location is extremely important. Call your veterinarian for any of the following: small puncture wounds, large lacerations, wounds accompanied by excessive bleeding and wounds over an important joint or over any ligaments or tendons.

What to do:

- Stop the bleeding. Place a pressure bandage – an absorbent pad or wad of gauze – over the area and hold it in place with Kling (conforming bandage), making sure it's not overly tight. Place another type of cotton wadding on top and use a cohesive bandage (such as Vetrap) to hold that in place. To determine the correct tension, unroll it and pull out as far as you can and then relax that by 50 per cent. Don't make it too tight, or you'll create a tourniquet effect. If the wound continues to bleed, place a bandage over top of it again and just keep adding layers until the bleeding stops
- Once the bleeding has stopped, add another wrap such as a cotton quilt and cover with a polo wrap
- Conduct a physical exam
- Call your veterinarian
- Place the animal in a comfortable, warm stall, ensuring that the lighting is good in case sutures are necessary
- Prepare a bucket of warm water
- Double check the last time your horse had a tetanus shot

What not to do:

- Don't place any kind of tourniquet over the area unless your veterinarian advises you to do so
- Don't clean the wound. You might push dirt or bacteria further into it
- Don't place any ointment or salve on the wound
- Don't delay calling your veterinarian

Eye trauma

The symptoms are often difficult to see, so watch for a horse that appears to be squinting or may have an eye that's watering. To detect squinting, check the eyelashes. They should be pointed up or out to the side, not downwards. The animal may also act blind or become nervous when you're on one side of him.

What to do:

- Call your veterinarian
- Conduct a physical exam in a dark, quiet place
- If you need to transport your horse, use an old bra to protect and cover the eye

What not to do:

- Don't delay calling the veterinarian. Eye trauma is always considered an emergency
- Don't put any ointment into the eye unless your veterinarian recommends it. Don't use ointments or drops from a previous time as they may have been prescribed for different conditions
- Don't try to examine the eye yourself. Your veterinarian often has to use a sedative and a nerve block to conduct an examination

Foaling problems

Although very rare and impossible to prevent, foaling problems can develop and escalate very quickly. Call your veterinarian immediately in any of these circumstances:

- The water breaks and there's no foal on the ground within 30 minutes
- The foal presents abnormally. It should present with one foot in front, the other foot slightly back with the nose nestled on top and the hooves pointing down
- The placenta is delivered ahead of the foal. This is called a red bag delivery
- There's excessive hemorrhage

What to do:

- Call the veterinarian immediately
- Conduct a physical exam if it's safe
- Keep the mare quiet and comfortable
- In the case of a red bag delivery, your veterinarian may instruct you to cut the white star of the red bag and pull the foal. This is the only time you should attempt any manipulations on a foal

What not to do:

- Don't attempt to reposition or pull the foal yourself unless your veterinarian advises you

Dr. Suzanne Mund, who graduated from the WCVM in 2013, is a resident in large animal surgery and a Master of Science graduate student in the WCVM Department of Large Animal Clinical Sciences.

Fire as a yearling.
Supplied photo

Equine Elders

By Christina Weese

Gary and Jackie Chad with their children Lauren (astride Bud) and Justin (beside Blue).
Cindy Moleski

Every year, veterinarians at the Western College of Veterinary Medicine's Veterinary Medical Centre (VMC) examine and treat hundreds of horses.

While some equine clients use the teaching hospital during an emergency or to recover from a serious health incident, others are "regulars" who visit the WCVM for routine and not-so-routine care over the course of their lifetimes.

Blue and Fire were two patients that fit the latter category. These two local horses — owned by different families — became longtime patients at the VMC. During the same week in August 2017, both Blue and Fire had to be humanely euthanized by the WCVM clinicians who had cared for them throughout the years. Born in 1982, both horses were close to 36 years old when they died. Here are their stories.

Jackie and Gary Chad purchased Blue, a part-bred Arabian mare, when she was 14 years old. Blue served for many years as Jackie's all-purpose western riding horse. For a brief time, she also performed as a steady and dependable lesson horse at Sandhills Stables before the Chads purchased an acreage.

Although she was happy to be around her people, Blue sometimes provided her own entertainment. The mare had a consistent routine whenever Jackie came out to the pasture – she would only consent to being haltered on the third try. And she loved getting out of her pen to run around.

"She was the most agreeable and happy horse," says Jackie. "She was also kind of complicated in her manner – but probably one of the best horses I ever had."

Amazingly, Blue was still up for light riding duties at 30 years of age. "In the last four years we decided not to ride her as she'd lost some weight," explains Gary. But Jackie ensured that Blue still had lots of attention and adequate exercise.

"I always included her when we brought the other horses in to the arena. She exercised as part of the group; she'd walk around the arena while we rode."

"As [Blue] got older, we relied on the vet college for advice on how to take care of her properly," says Gary. "She lost a lot of her teeth and went from eating hay to eating cubes. They advised us as to how much she should get. She also started getting eye infections in winter; the vets helped us with medication."

Unfortunately, a weakened immune response is a common problem in older animals. To help Blue fight her eye infections, WCVM veterinarian Dr. Michelle Husulak suggested Jackie try a combination of medications including antibiotic drops and serum taken from Blue's own blood. Since the cornea lacks its own blood supply, the serum's proteins helped promote healing.

"She [Blue] was always just sassy, and we liked her," says Jackie. "She was robust right up to the very end – I think she just got tired."

Blue had few vet visits besides her yearly checkup and teeth floating. In contrast, Fire seemed to have nine lives – and needed all of them.

Peter Cosh first set eyes on Fire Diamond (Fire) when the chestnut gelding was only a few months old, at Arab breeder Ross Cannon's farm in 1982. Peter showed the young colt in Arabian halter classes, started him under saddle himself and enjoyed a lot of riding along the riverfront near Beaver Creek just south of Saskatoon, Sask.

Anyone who has owned horses long enough knows that some get into more than their fair share of mischief, and for Peter, that horse was Fire. When he was younger, Fire caught one of his legs in barbed wire. He was rushed to the WCVM for treatment and spent two weeks recovering in the hospital. Although his hoof grew back with a permanent split, he regained 100 per cent of his soundness.

"The vets commented numerous times that he was a real fighter," says Peter.

In 2010, the 28-year-old Fire was admitted to the VMC with severe colic symptoms. While veterinarians determined that he had septic peritonitis (infection in his abdomen), they couldn't find the root cause of his colic.

Peter asked if the clinical team would perform an X-ray – a procedure that isn't normally employed for colic. They performed one at his request, however, and discovered a nail in Fire's abdomen. It was suspected that this nail had perforated Fire's intestine, leading to the abdominal infection.

Since the option of surgery held many challenges, the clinicians suggested trying medical management first. They continued treating Fire with antibiotics and fluids, and luckily, he pulled through. Fire's case is still cited to WCVM students as an example of why it's important to explore all avenues of diagnosis. Two years after the incident, a follow-up X-ray showed no signs of the nail.

Fire was susceptible to equine asthma (heaves), and he eventually required medication for pituitary pars intermedia dysfunction (PPID). In August 2017, Peter made the very tough decision to humanely euthanize Fire when pain from an abscessed hoof became unmanageable.

Peter describes Fire as a real people horse. "He didn't mix that well with other horses – he was always bottom of the [herd] – but he'd come running to see me from wherever he was."

Fire was an extra special support to Peter because of a fatal grenade explosion that happened in 1974 when he was in the military cadets.

"I didn't know it until this past year, but I suffered from PTSD [post-traumatic stress disorder] all this time. Back then they didn't even know what PTSD was, but he was kind of my counsellor. So when he passed, it was really tough on me. He was my best friend for a long time."

Genetics probably played a part in Blue and Fire's advanced years: Arabians have a reputation for longevity. But no horse reaches such an advanced age without special care from their owners. Most senior horses struggle with dental problems and subsequent diet challenges, and advice from trusted veterinarians can be crucial to maintaining their weight, health and well-being.

"I don't think [Blue] would have lived as long if we hadn't had good advice from the vet college," says Jackie. "I think you can keep a horse around for a long time if they have good care and attention."

Although Fire was extra special, Peter still has two quarter horses over 30 and three other horses in their mid-20s.

"We depend on the WCVM's Field Service and Large Animal Clinic to keep our group healthy. It truly is a team effort, and we really appreciate their help."

Human medicine helps solve horse research puzzle

By Nicole Sereda

Equine scientist Dr. Julia Montgomery and her research team encountered surprising results while conducting a study aimed at finding biomarkers for equine metabolic syndrome (EMS), a metabolic and hormonal disorder in horses that's often compared to Type 2 diabetes in humans.

The researchers were puzzled by the high levels of D-lactate they found in the collected equine blood samples.

"When we started running some of the samples initially, the numbers we got were all pretty close together, but they were a lot higher than physiologically makes sense," explains Montgomery, a specialist in equine internal medicine at the Western College of Veterinary Medicine (WCVM).

Since a previous pilot study had provided plausible outcomes that made physiological sense, Montgomery and her team set out to identify the reason behind their unexpected results. They found one main difference between the two studies – the length of time that the blood samples had sat in the freezer.

Caitlin Taylor

As the researchers began investigating what had altered the stability of the D-lactate in their equine blood samples, they found their answer in human medicine.

Deb Michel, a research technician in human pharmacology and nutrition who was assisting on the project, found an article describing how D-lactate levels can increase in human blood after it's placed into a tube.

Scientists had discovered that red blood cells in stored blood samples continue to metabolize glucose and produce D-lactate as a byproduct of this reaction. Since this D-lactate can't be used by the red blood cells, it continues to build up, resulting in an elevated level of D-lactate – a value that's higher than physiologically possible.

Human medicine researchers had found that the key to preventing these artificially high lactate levels lay in the tube used to collect and store the blood. By using blood tubes with sodium fluoride, the scientists could decrease the amount of D-lactate in the human blood samples. Sodium fluoride inhibits the enzyme that's essential to glucose metabolism and the resulting conversion of glucose to lactate.

Montgomery's team set out to learn whether sodium fluoride has the same effect on glucose metabolism in equine blood samples. They collected blood from a random population of horses in the Saskatoon area. Each horse had its blood drawn into two separate tubes – a tube to which sodium fluoride had been added and a normal blood tube with no additives.

In the lab, the samples were centrifuged, separated, and then stored in the freezer. To determine if the length of time in the freezer affects the stability of D-lactate, the researchers tested the samples to measure their D-lactate levels after one, two and six months.

Initial results after one month and two months of storage showed that D-lactate levels in the normal blood tubes were significantly higher than those found in the sodium fluoride tubes. These results suggest that the sodium fluoride stops the metabolism of glucose in red blood cells and prevents the buildup of D-lactate – just as it does in human blood samples.

The concept is simple, but the results will provide important information that expands researchers' scientific knowledge and could have implications in other equine studies.

For example, if Montgomery's EMS investigation shows that an increase in D-lactate levels is a significant indicator of the syndrome, then obtaining accurate measurements of D-lactate levels in blood samples will be critical for diagnosing EMS.

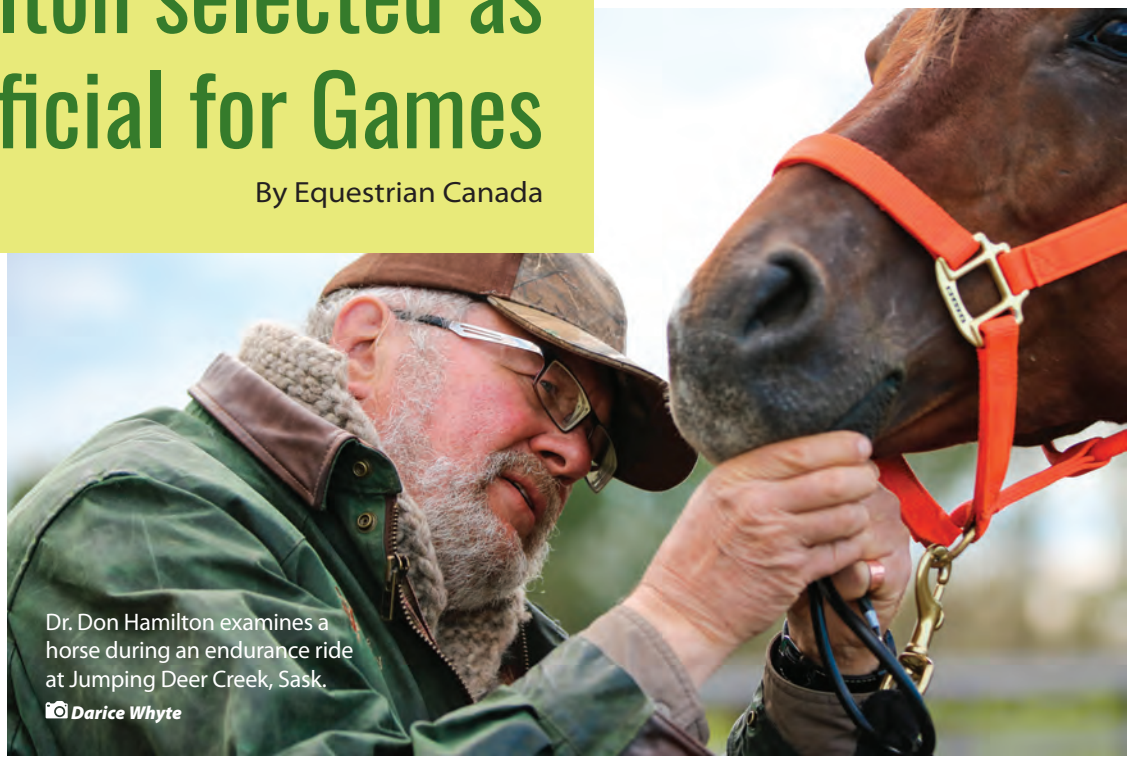
Even if D-lactate doesn't prove to be a useful biomarker for diagnosing EMS, Montgomery believes the information learned will be important for future research.

"I think that it will help us learn some very basic things and that will lead to a lot more questions down the road."

Nicole Sereda of Calgary, Alta., is a second-year veterinary student who was part of the WCVM's Undergraduate Summer Research and Leadership program in 2017.

Hamilton selected as FEI official for Games

By Equestrian Canada



Dr. Don Hamilton examines a horse during an endurance ride at Jumping Deer Creek, Sask.

Darice Whyte

Dr. Don Hamilton, *professor emeritus* of the Western College of Veterinary Medicine (WCVM), is one of four Canadians who have been selected as officials for the 2018 Fédération Équestre Internationale (FEI) World Equestrian Games this fall.

The 2018 games will take place in Mill Spring, N.C., from Sept. 11 to 23. Hamilton has been appointed as a Vet Commission (VC) 3 Member, who will be responsible for providing veterinary care and oversight for the endurance portion of the games.

Elizabeth McMullen, John Taylor and Cara Whitham — all from Ontario — were also appointed as 2018 games officials.

Hamilton's appointment to VC 3 recognizes the excellence of his lengthy veterinary career. He grew up on a small farm in central Saskatchewan before attending the WCVM. There, Hamilton earned his Doctor of Veterinary Medicine degree in 1970 and went on to complete master's and PhD programs at the University of Saskatchewan (U of S).

Hamilton taught for almost four decades at the WCVM. His research, which focuses on equine renal and acid/base physiology and ion channels, is directly applicable to the assessment of competition horses and their health.

It was at the U of S where Hamilton's colleague, Dr. Patricia Dowling — an avid endurance rider herself — introduced him to the sport. Hamilton was immediately drawn to the biological challenges of endurance, which led to his eventual certifications as a 4* Official Veterinarian in Endurance, a 3* Endurance Veterinary Treatment Official, and an FEI Permitted Treating Veterinarian.

"A sport where horse and rider compete for up to 100 miles in less than 24 hours …" mused Hamilton.

"As a veterinary physiologist, I became immediately interested because of the amazing physiological ability of these horses to run ultra-marathons. Also, as I have said many times, I stayed with the sport as an endurance control vet because of the owners and riders who are, in addition to being wonderful people, very responsible and knowledgeable riders."

> "We are responsible, with the rider, for the welfare of the horse."
>
> - Dr. Don Hamilton

Veterinary responsibilities vary greatly between disciplines, so Hamilton's specialized background has made him a sought-after veterinary resource in the endurance world.

"We are responsible, with the rider, for the welfare of the horse," explained Hamilton of the role of VC 3. "Endurance is an aerobic sport and, in addition to lameness, we try to detect the horse that may be exceeding its ability to remain hydrated and not become excessively tired. As an endurance vet, we try to prevent problems by declaring the horse as not fit to continue when we suspect an impending issue which may compromise the welfare of the horse."

Hamilton will work with the VC 3 president, the foreign veterinary delegate and nine other members to determine if each horse competing at WEG is fit to continue. The collaborative nature of the commission helps to ensure not only that the horses receive the best care, but also that evaluation standards remain consistent across all competitors.

"Selection is an honour and I feel privileged," concluded Hamilton. "It is a great way to cap a career in veterinary medicine."

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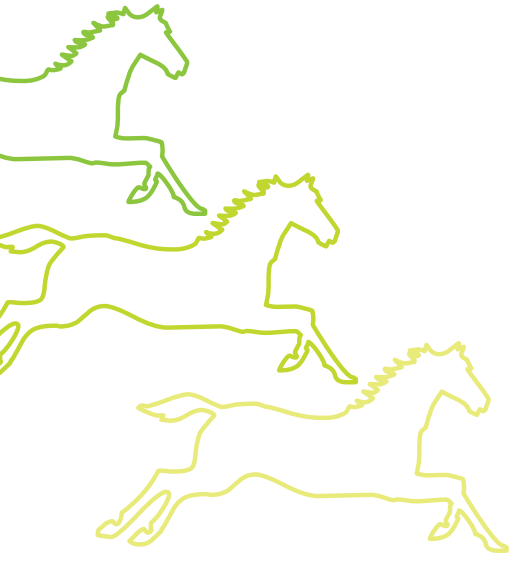
GALLOPING GAZETTE



IN MEMORIAM

Dr. William (Bill) Saville, a well-known equine researcher and WCVM alumnus, died on Jan. 8, 2018. He was 71.

Born and raised in Wainwright, Alta., Saville graduated from the WCVM in 1977 and completed an internship at University of California (Davis) before returning to Alberta to work in private practice with a focus on equine medicine.

In 1993, Saville came to The Ohio State University (OSU) for an equine internal medicine residency and went on to complete a PhD degree. After graduating, he joined the faculty at OSU College of Veterinary Medicine where he served as a teacher, researcher and administrator.

Among Saville's key contributions to equine health was his extensive research of equine protozoal myeloencephalitis (EPM), a neurologic disease in horses. In addition to his research, one of his most important interests was to work as a mentor to many students over the years.

Dr. William (Bill) Saville

KNOWLEDGE IS POWER

In early March, more than 200 young horse enthusiasts gathered at the WCVM for the annual Equine Education Day, organized by members of the WCVM's Equine Club. Members of local 4-H Clubs, Pony Clubs and other riding clubs took part in talks about equine dentistry, first aid, hoof care and other essential equine health topics. Older members also had the chance to gain more knowledge through tours and hands-on activities.

EQUINE EXPO

WCVM representatives highlighted all aspects of equine health during the 2018 Saskatchewan Equine Expo that took place at Saskatoon's Prairieland Park from Feb. 15-18. The college's clinicians worked with local farriers and horse owners to demonstrate the steps of diagnosing and treating lameness in two equine patients.

Inside the trade show area, a WCVM team co-hosted the event's equine education area with members of the Saskatchewan Horse Federation (SHF) and offered a lineup of speakers who covered a range of topics including equine safety on the road and at home, breeding and foaling, obesity and spring health care. A highlight was Dr. Dennis Rach's talk, "No teeth, no horse" that covered equine dental health and prevention.

ALTHOUSE RECEIVES PUBLIC SERVICE AWARD

In November 2017, Saskatchewan's chief veterinary officer Dr. Betty Althouse (WCVM '82) was recognized for her outstanding contributions with the Saskatchewan Premier's Award for Excellence in Public Service. Before joining the province's Ministry of Agriculture in 2012, Althouse spent 14 years with the Canadian Food Inspection Agency. Previous to her public service career, she also spent eight years in private practice and was a swine producer for more than a decade.

Althouse works closely with the province's equine industry and has been an invaluable resource to horse owners and veterinarians alike. She is known for her clear understanding of the agriculture industry, thanks to her extensive experience and participation in industry-related activities. She's also committed to understanding and addressing consumer concerns. She is also noted for valuing diverse opinions and backgrounds while finding all the details and the most accurate information. She commits to promises and accepts responsibility and is "always willing to answer the hard questions."

Not one to seek the limelight, Althouse is modest in her response to words of congratulations about the award. But what she's extremely appreciative of is the fact that she was nominated by the group she works with: "That means a lot to me."

Drs. Lea Riddell and Michelle Husulak describe an aspect of lameness at Equine Expo.
Christina Weese

RESEARCH IN PRINT

A round up of WCVM-related equine research articles that have been recently published in peer-reviewed journals

Misuno E, Clark CR, Anderson SL, Jenkins E, Wagner B, Dembek K, Petrie L. "Characteristics of parasitic egg shedding over a one-year period in foals and their dams in two farms in central Saskatchewan." *Canadian Veterinary Journal*. Mar. 2018. 59(3):284-292.

Carmalt JL, Mortazavi S, McOnie RC, Allen AL, Unniappan S. "Profiles of pro-opiomelanocortin and encoded peptides, and their processing enzymes in equine pituitary pars intermedia dysfunction." *Public Library of Science (PLOS) One*. Jan. 2018. 13(1):e0190796. doi: 10.1371/journal.pone.0190796. eCollection 2018.

Bracamonte JL, Devick I, Thomas KL, Hendrick S. "Comparison of hand-sewn and oversewn stapled jejunojejunal anastomoses in horses." *Canadian Veterinary Journal*. Jan. 2018. 59(1):67-73.

Carmalt JL, Scansen BA. "Development of two surgical approaches to the pituitary gland in the horse." *The Veterinary Quarterly*. Dec. 2017. 38(1):21-27. doi: 10.1080/01652176.2017.1415488.

Montgomery JB, Bracamonte JL, Alam MW, Khan AH, Mohammed SK, Wahid KA. "Is there an application for wireless capsule endoscopy in horses?" *Canadian Veterinary Journal*. Dec. 2017. 58(12):1321-1325.

Higgins SN, Howden KJ, James CR, Epp T, Lohmann KL. "A retrospective study of owner-requested testing as surveillance for equine infectious anemia in Canada (2009-2012)." *Canadian Veterinary Journal*. Dec. 2017. 58(12):1294-1300.

Carmalt JL, Waldner CL, Allen AL. "Equine pituitary pars intermedia dysfunction: An international survey of veterinarians' approach to diagnosis, management, and estimated prevalence." *Canadian Journal of Veterinary Research*. Oct. 2017. 81(4):261-269.

Kosolofski HR, Gow SP, Robinson KA. "Prevalence of obesity in the equine population of Saskatoon and surrounding area." *Canadian Veterinary Journal*. Sept. 2017. 58(9):967-970.

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