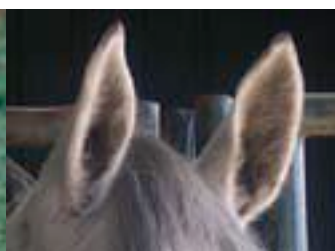




# From the Horse's Mouth

A newsletter from Paton and Martin Veterinary Services (PMVS), Aldergrove, BC <http://www.pmvetservices.com>



FALL 2011

## What's new?

For your convenience, we are now providing **regular scheduled appointments on Saturday and Sundays as well as expanding our geographical area of coverage.** These services are being provided by the addition of Dr. St-Laurent to our ambulatory team. Please contact our office for further details.

On April 1<sup>st</sup>, Dr. Antonio Cruz became a new partner in our company. Dr. Cruz has been instrumental in developing our referral service and equine hospital. Dr. Cruz is committed to remain at Paton and Martin and will continue offering his services to all of you. He and his BC-born wife Julie are proud to call BC home.

Read more news on back cover page.

## Equine Metabolic Syndrome – What is it and How does it affect my horse?

by Dr. David J. Paton

Equine metabolic syndrome (EMS) is a term used for a group of clinical abnormalities that often include obesity, insulin resistance (IR) and a predisposition to laminitis. Horses with this condition typically are overweight and are often recognized as being "easy keepers". Read more on the inside pages 2-3.

## Surgical Problems in the Foal

by Dr. Antonio M. Cruz Dipl. ACVS, Dipl. ECVS

There are a few conditions that necessitate immediate life-saving surgery in foals. Abdominal (colic) surgery in foals under 30 days of age has become more common with improved neonatal care. Orthopaedic surgery can often be delayed with the exception of infected joints (a.k.a. joint ill), fractures and severe flexor deformities (a.k.a. contracted tendons). More on page 5.



# EQUINE METABOLIC SYNDROME (cont'd)



*"We have long known that fat horses are extremely susceptible to laminitis, especially when allowed to pasture on lush grass."*



With many of our modern day feeding and management practices the over fed, under exercised horse has become the norm in many management and training environments. Horses being fed high sugar diets without adequate exercise are being set up to becoming obese and developing EMS.

We know that while most horses that have EMS are overweight "easy keepers", many overweight horses do not have EMS. The EMS horse typically will have a cresty neck, fat accumulations over the shoulder, rump and tail head. Fat accumulation around the sheath and udder are also common findings. Overweight horses also have huge fat deposits in and around many internal organs including the heart, liver and kidney. These horses tend to retain their fat pockets, despite feed restrictions and increased exercise.

Insulin resistance (IR) in the horse has been compared to type 2 diabetes in humans. IR can loosely be defined as an inability of the body to adequately utilize glucose in muscle and other tissues and can affect the ability of the liver and fat cells to function properly. Horses with IR can be predisposed in a myriad of other metabolic conditions that include not only laminitis but also other life threatening complications associated with infections, such as metritis from a retained placenta and enterotoxaemia following colic.

We have long known that fat horses are extremely susceptible to laminitis, especially when allowed to pasture on lush grass. It is now understood and generally believed that EMS horses, due to the complicated effects of their IR cannot tolerate the high sugar content of the grass and may develop laminitis. When radiographed many EMS horses show evidence of low grade previously undetected coffin bone rotation. Of course we are all aware of the horrific cases of severe debilitating life threatening (ending) cases of laminitis. Many of these horses have EMS.

We need to include in our discussion about this condition the role of another important metabolic disorder called Cushing's Disease. This condition is most common in older horses and involves an enlarged part of the pituitary gland. This condition results in an over stimulation of the adrenal gland and the excessive production of cortisol, the body's natural cortisone. **A large number of Cushing's horses also have IR.** The classic signs of Cushing's disease include delayed shedding of the hair coat, muscle wasting, increased urination and water consumption, laminitis and obesity.

The diagnosis of EMS involves several factors. Assessing body condition in conjunction with measuring blood insulin levels is easily done. A combination of obesity, elevated insulin and laminitis confirm the diagnosis.

It is important to know that there are breed susceptibilities to EMS. Ponies, Warmblood breeds, Morgan and some Quarter Horse lines are commonly affected.

The treatment of EMS is mainly aimed at reversing obesity. Obviously, decreasing intake of high-energy grains, fat and hay is a given. Increasing exercise is imperative. Fit horses are at minimal risk for IR and EMS. (Have we not heard this story in reference to humans!) Horses that must be pastured should only be allowed out for limited time periods and a grazing muzzle should be used. Avoid lush grass in the spring and fall. Hay analysis and accurate weighing of all feed being fed will help prevent becoming overweight. Feeding of certain medications such as Thyroxin and Chromium may be helpful. Diagnosing any other coexisting conditions such as low thyroid function, Cushing's Disease or other medical conditions is important.



“A large number of Cushing's horses also have IR.”

Prevention is a key to this discussion. Horses that are regularly exercised and who are fed to avoid becoming fat are unlikely to have EMS. Avoiding high-energy feeds and lush grasses are of great importance. Identifying horses at risk is vital in order to institute management and treatment programs before disaster strikes.

In conclusion, I want to emphasize that the diagnosis of EMS is not a free pass for the horse owners to get out of being responsible for their horses' well being. I feel strongly that just like in humans, poor nutrition and lack of exercise are the most important contributors to ill health. Horses were designed to eat natural grasses and to not be fat. In general, horse owners are responsible for horses becoming obese. We now know that just like some people, some horses are predisposed to being fat and what we now term EMS. That being said, the prevention of this and the many diseases associated with EMS can be achieved.

## How do surfaces interact with the horse's foot?

by Dr. Antonio M. Cruz Dipl. ACVS, Dipl. ECVS

This is a condensed excerpt with personal contributions from the "White Paper on Racing Surfaces" by the Jockey Club from which one of the contributing authors (Dr. J. Thomason) was part of our research group at the U of G.

During foot landing, the energy from the shock of contact with the ground, and all the forces generated, are transferred through the hoof. It is well documented that the amount of energy and forces depend strongly on the properties of the exercising surface, but there are several complicating factors: 1: surface type; 2: the energy and force change throughout the footfall (stance) and swing (flight) phase; 3: shoes modify hoof-surface relation; and 4: the horse's own conformation.

The loads (forces) on the leg are transmitted to bone, muscle, tendon and ligament. Each structure experiences its own resulting load of which ultimately are responsible for injury if they exceed tolerable thresholds. Below these thresholds the body experiences healthy adaptive responses, such as increasing muscle mass. If the thresholds are exceeded repeatedly (for example, during every footfall at speed), the response can be tissue degeneration and breakdown. Therefore, injuries can principally occur in two different ways: as a sudden acute event or as the acute manifestation of chronic ongoing degeneration due to repeated minor overload.

For instance, in race horses at racing speeds reaching 38 mph (17 m/s), the hoof hits the track approximately 150 times a minute, remaining on the ground in the stance phase for a sixth of a second each time. The short duration of the stance hides from our eyes all the events (stages) that take part during foot landing. (Figure 1) The mechanics of each stage is also dependent on the design of the track (e.g., radius of turns, angle of banking), and the properties of the track. We identify 4 stages: Primary impact, Secondary impact, Support, and Rollover.

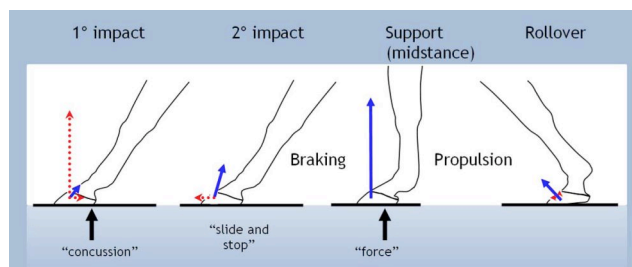


Figure 1. Stages of the landing showing the differences in acceleration (red) and GRF (blue) among the stages. When the GRF arrow is filled, that indicates that both vertical and horizontal components of GRF are present. The blue arrow shows the direction in which the ground is pushing the horse.

## EQUINE GASTRIC ULCERATION- FAQ's, by Dr. Marielle St-Laurent

**Primary impact** - When the hoof impacts the ground, it is moving downward at a high speed but moving forward at a relatively slow speed. Essentially the hoof hits the ground vertically, like the head of a dropped hammer. As the hoof meets the ground it slows down rapidly towards zero velocity. If there is an appropriate cushion, the impact is heavily dampened by the hoof and the ground surface. Forces acting on the foot are relatively low, because only the mass of the hoof and pastern participates in this collision. (By keeping mass low, it is effectively only the mass of the digit; forces are also usually kept within the limits of strength of the bones and soft tissues of the hoof and limb.) During primary impact the force is very sensitive to the vertical hardness of the surface. The shock-absorbing structures of the hoof (frog, digital cushion, heel bulbs, laminar junction) absorb 70% of the force. Injuries caused by the shock of primary impact are confined within the hoof – e.g., collapsed heels, some quarter cracks, etc.

**Secondary impact (slide and stop)** – As soon as the hoof is on the surface, the body of the horse, which is still moving forward, collides with its own implanted and stationary leg. The body tends to push the leg forward, forcing the hoof to slide and then stop. Forces acting on the leg now begin to rise dramatically; the hoof pushes into the ground and the ground exerts an equal and opposite force, known as the ground reaction force or GRF. GRF can be broken down into vertical (upward) and (forward) components. This force travels up the leg and is absorbed by muscles, bones, tendons, ligaments and joints. Secondary impact has the potential to have a large role in causing injury. If the foot slips forward excessively, it can force the digital flexor muscles into rapid, unpredicted contraction, which can cause tears within a muscle. If the foot comes to too rapid a halt, it will exacerbate any forward motion of the coffin bone. Of possibly greater consequence, shortening the duration of the slide will increase the magnitude of the horizontal component of the ground reaction force, exerting larger-than-normal bending forces on the cannon bone which can lead to fracture. Optimizing the secondary impact by improving upon the shear forces generated during the "sliding" is important to prevent injuries.

**Support** – This stage overlaps with secondary impact. The distinctive mechanical characteristic of this stage is the rise and fall of the vertical component of the GRF. The limb prevents the body from falling due to gravity and accelerates it upward into the next swing phase. The vertical GRF may reach 2.4 times the body weight of the animal at a racing gallop. The sheer magnitude of the forces during this stage implicate this stage very strongly in causing traumatic bone fractures, as well as tendon and ligament ruptures or strains. Chronic joint problems will certainly be exacerbated, if not initiated, by joint loadings at this time.

**Rollover** – This stage is the last phase of unloading, beginning as soon as the heels leave the surface. The hoof itself unrolls and then pushes off from the ground. This stage is important in that altering its duration strongly affects the movement of the limb, which in turn affects the landing of the next step. Forcing a shorter or longer stance, under those performance activities which induce higher loading conditions, will affect the forces acting on bones and soft tissues. If more muscular control is necessary to perform the activity, muscular fatigue may become a factor in injury. If breakover is delayed, residual tension in the deep and superficial digital flexor tendons may flick the foot back with sufficient speed to cause rate-dependent injury to those tendons.

### **How do horses acquire the disease?**

Gastric ulcers are thought to result from an increased exposure to gastric acidity. There are two main parts in the stomach, the lower glandular part where the cells produce the acid and the top squamous mucosa that is meant to mix and crush food. Most ulcers occur on the top part, which is not meant to be exposed constantly to acid. Because horses are herbivores that were meant to eat grass all day long, they have a constant secretion of gastric acid in their stomachs. When horses eat, the food acts as a buffer and the saliva plays an anti-acid role as well. The stomach also has a mucus-bicarbonate layer to protect itself from the acidity. The increased acidity exposure happens when the stimuli to produce acid increase or when the defense mechanisms of the stomach against acidity weaken. Stress and hormonal imbalance increase the secretion of acid. Prolonged fasting periods and decreased blood flow to the stomach weaken the defense mechanisms. Unlike humans, bacteria do not appear to be a cause of equine gastric ulcers.

### **Is my horse at risk?**

Studies show that up to 90% of racehorses and up to 60% of show horses have gastric ulcers. That being said, not all horses with gastric ulcers actually show clinical signs or symptoms. Horses fed only twice daily or with a high concentrate low roughage diet have prolonged periods of increased acidity contributing to the problem. Showing, hauling, strenuous exercise, mixing groups of horses and even stall confinement can predispose horses to ulcers.

### **Is there a benefit to doing a gastric endoscopy on my horse?**

The signs and symptoms are not as clear as you may think. They are pretty unspecific and include loss of appetite, starting their meal with a lot of appetite and stopping in the middle of their meal, discomfort after meals, poor body condition, poor hair coat and poor performance. Horses typically don't colic from ulcers unless they are very severe. In that case, they will typically lie on their back and appear like they cast themselves in their stall or show bruxism (grinding their teeth together). Gastric ulcers can be very serious if they become deep and start bleeding and even fatal if they rupture.

The only way to effectively diagnose gastric ulcers is via a gastroscopy. This procedure is done by passing a 3 meter long camera/scope through the nostril and esophagus to see inside the stomach. This allows the veterinarian to explore the integrity of the stomach wall and see the severity and the location of gastric ulcers if they are present.

### **How do I treat gastric ulcers?**

The treatment consists of eliminating risk factors and reducing acidity in the stomach. There are two oral drug families that achieve that goal, but only omeprazole (that you may know as Gastroguard) is approved and can be given only once a day effectively. It is worth it to mention that compounded or human formulations of omeprazole products have not been shown to have efficacy in treating gastric ulceration in horses. Medication is only appropriate when the horse is showing clinical signs or if stressful situations are on the schedule and you would like to prevent any possible problems. You can certainly help prevent gastric ulcers by eliminating risk factors. The most important risk factors are stress and long periods without food. Therefore, giving your horse access to free choice grass hay throughout the day is definitely a very good prevention method. This will also give your horse something to do and might help reduce his stress level and boredom.

For additional information or how to book a gastroscopy exam on your horse please contact our office at (604) 856 3351.

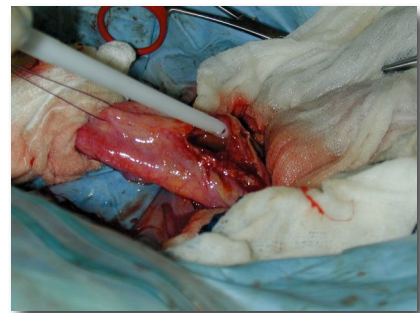
## Foal Surgical Conditions (cont'd)

Foals are fragile creatures. For all their might when they become adults, foals can go from a perfectly healthy state to a life-threatening condition in a matter of a few hours. In addition, their display of clinical signs is not always very obvious to the untrained eye and typically very severe metabolic derangements are only identified after an extensive evaluation and diagnostic tests. While surgical colic is uncommon it is usually a very challenging problem. From the accurate diagnosis to a successful treatment, the road to health may be plagued with many ups and downs. Owners should be aware that any "out-of-the-ordinary" behavior in a foal should be taken seriously and professional advice sought promptly. Even if this means that you may be overreacting, being safe rather than sorry is a good rule of thumb to live-by. One of the most common causes of surgical colics in neonates is a small intestinal strangulation resulting from an internal hernia, scrotal hernia (in males) or a twist of the entire small intestine at its root, also called mesenteric root volvulus or torsion. This means that the blood supply to the small intestine has been compromised. Typically, these foals may present with a large range of clinical signs, from being depressed to having severe pain. One of the landmarks of this problem is a progressive distention

of the abdominal contour. Rarely will these foals lose their drive to nurse, except when entering a depressed state (almost stupor-like). Foals may be lying down without violent signs of colic, but with signs of discomfort such as straining or being restless. The evaluation of any foal with moderate to severe colic is extensive and should include, at the very least, a thorough physical exam, nasogastric (stomach) intubation, blood work and abdominal ultrasound. This basic approach will obtain all the necessary information to help you make some decisions. Colic surgery and anaesthesia in foals has come a long way in the last 7-10 years. However, it is still a delicate process and requires the proper support, facilities and personnel to improve the chances of survival. Prompt and aggressive attention is paramount for success.

A ruptured bladder is also a cause of depression in foals that necessitates surgical repair. Ruptured bladders occur more commonly in males and typically occur during birth. However, clinical signs are not detected for 2-3 days. Contrary to what may seem intuitive, foals with ruptured bladders, will usually urinate. However, the pattern of this urination is abnormal; they will urinate small amounts frequently as well as strain frequently. Foals with ruptured bladders will develop metabolic derangements and inflammation inside the belly (peritonitis), as urine leaks into the abdomen. Due to the high potassium

content of urine, foals affected with ruptured bladders will develop a state of hyperkalemia, which means excessive potassium in the blood stream. This potassium excess produces abnormalities which manifest as progressive depression, leading to coma and eventual death. While ruptured bladders are not a surgical emergency, they are a medical emergency as they need to be stabilized before taking them to surgery to repair the ruptured bladder. The prognosis for this problem is favorable as long as the foal remains strong prior to surgical repair.



A ruptured bladder as seen during surgical intervention to repair it. The bladder has been partially extracted from the abdominal cavity and the tear can be seen as the white instrument is positioned through the tear inside it.

Ruptured bladders are not a surgical emergency, but a medical emergency as the foals need to be stabilized before taking them to surgery to repair it.

# MORE NEWS...



*"Dr. St-Laurent's primary role is to provide regular and emergency ambulatory care to horses."*

## Welcome back to Dr. Marielle St-Laurent!

We are delighted to announce that Dr. St-Laurent has recovered fully from her head trauma following an on-the-job injury. She has re-joined PMVS team. Marielle graduated from the University of Montreal in 2010 and joined us shortly after as a veterinarian residing in our hospital facilities. Marielle's professionalism, easy-going nature and excellent veterinary skills prompted PMVS to

hire her as an additional ambulatory clinician. **Marielle will be providing regular scheduled appointments on Saturday and Sundays as well as emergency care.** Marielle is complementing our team of veterinarians so we can offer regular appointments any day of the week. You may have encountered Dr. St-Laurent outside of work as Marielle has re-started her dressage riding training.

## PMVS at Mane Event

As in past years, Paton and Martin Veterinary Services (PMVS) will be present. At the upcoming Mane Event at the Heritage Park in Chilliwack (October 21-23) Please stop by our booth to say "Hi!" and meet our newest veterinarians Dr. Armstrong and Dr. Jameson.

## Dr. Martin spoke at the recently held Quarter Horse Show at Thunderbird

In July, Dr. Martin delivered a lecture on quarter horse lameness to a packed audience at Thunderbird Show Park. There were lots of questions and a keen interest in learning more about specific ailments affecting Quarter Horses.

## Dr. Cruz to lecture in Spain

This coming December Dr. Cruz has been invited to deliver a course on horse lameness to Spanish veterinarians at the Universidad Complutense of Madrid.

## Our internship program is growing!

We are very excited to announce that Drs. Randi Armstrong (a graduate of Auburn University) and Amber Jameson (a graduate of AVC in PEI) joined us in June as part of our team. Our internship program continues to provide new veterinarians with an opportunity to be exposed to all facets of equine practice, including surgical and hospital care. Our competitive selection process ensures that we get the best possible candidates available. Welcome Randi and Amber!

## PMVS invites horse clubs to visit hospital

Over the past few months we have had numerous visits to our facilities, including the Back Country Horseman, Vintage Riders Club as well as several pony and 4H clubs. If you are interested in your club visiting our hospital please contact our office at 604 856 3351 or send us an e-mail at [admin@pmvetservices.com](mailto:admin@pmvetservices.com)

## A BIG THANK YOU!

Thank you to all of you that continue to support our business. We sincerely appreciate your loyalty and commitment to our mission.



Dr. Randi Armstrong



Dr. Amber Jameson

## How to contact us

**By Phone:** 604 856 3351

**By Fax:** 604 856 2676

**By e-mail:** [admin@pmvetservices.com](mailto:admin@pmvetservices.com)

Sponsored by

 **Intervet**  
Schering-Plough Animal Health TM