

# S T I T L A

Every spring, rapidly growing grass will trigger endocrine laminitis in many horses, ponies and donkeys, that may result in euthanasia if correct treatment and foot care are not received. Around 90% of all laminitis cases are now thought to have an endocrine cause, that is, they are due to “insulin dysregulation”, and are often associated with a diet high in sugar or starch; the other 10% of cases being inflammatory or supporting limb laminitis. Horses with endocrine laminitis will have Equine Metabolic Syndrome (EMS) with or without Pituitary Pars Intermedia Dysfunction (PPID), formerly known as equine Cushing’s disease.



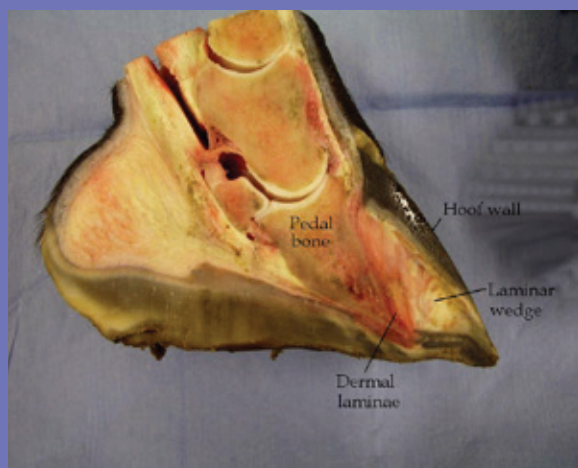
at the heels, a stretched white line and radiographic changes, through the horse being “footy” or short-strided on hard ground, unwilling to turn or trot, shifting weight from foot to foot and having a bounding digital pulse, to the horse lying down most of the time with an increased heart and respiration rate. Laminitis can quickly progress from mild to severe and should always be taken seriously.



**Hoof rings wider at the heels than at the toe suggest chronic laminitis.** *Credit Laura*

## WHAT IS LAMINITIS?

In a healthy horse the hoof wall wraps around the pedal bone and is connected to it by laminae - interlocking cells often compared to velcro. The abnormally high levels of insulin seen with endocrine laminitis cause the laminae to stretch and weaken, often leading to the hoof capsule and bone moving away from each other, known as rotation and/or sinking, under the horse’s weight. This can damage tissue, blood supply and nerves, causing pain, and eventually cell death, bone loss and sepsis if the damage is left uncorrected. Laminitis is described as chronic once rotation and/or sinking have occurred.



**Chronic laminitis - lamellar wedge fills the gap between the separated hoof wall and pedal bone.**

*Credit: Tanya*

## HOW IS LAMINITIS RECOGNISED?

Symptoms of laminitis vary considerably, and range from the horse appearing to be sound but having signs of chronic laminitis in the feet, such as hoof rings wider

## HOW IS LAMINITIS TREATED?

The cause must be identified and removed/treated, and the feet must be supported and fully realigned. With correct treatment, even significant damage to the feet can often be repaired and the horse returned to health.

- Laminitis should always be considered an emergency – call the vet, and farrier/trimmer.
- Ensure the feet are well supported with full solar surface conforming padding.
- Confine the horse on deep, conforming bedding to limit movement. Pad the feet before moving the horse to the area of confinement, and keep movement to a minimum, e.g. by using a low-loading trailer.
- Remove the horse from grass and feed a high fibre, <10% sugar/starch diet based on analysed or soaked hay, plus minerals, vitamins, protein, and essential fatty acids to meet minimum requirements. Never starve a horse with laminitis because of the risk of inducing hyperlipaemia – feed at least 1.2% of the horse’s bodyweight per day.
- Pain relief such as Bute or Danilon may be prescribed to reduce the pain but won’t treat the laminitis. It is now recognised that there is little inflammation involved in endocrine laminitis. If pain relief is still required after a week, it’s likely either because the cause of the laminitis hasn’t been correctly identified and removed/treated, and/or the feet haven’t been correctly supported and

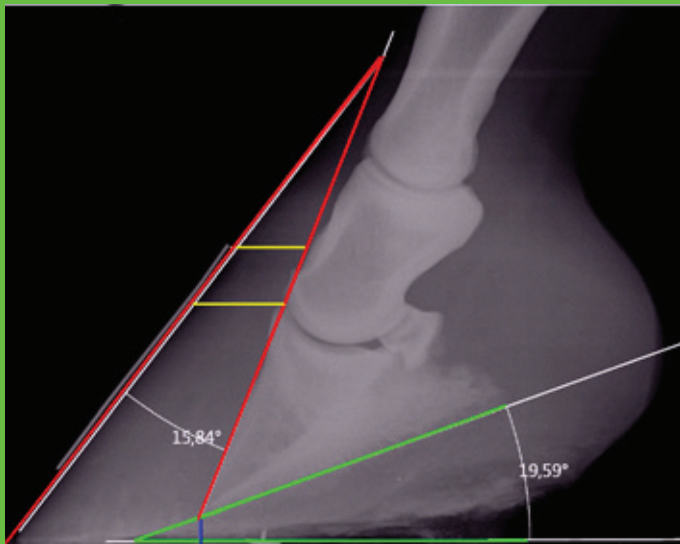


realigned, and the case should be reassessed.

- X-rays should be taken immediately to identify dorsal and palmar rotation, sinking, and sole depth.
- The feet should be trimmed as soon as possible to correct any dorsal and palmar rotation, to relieve pressure on the outer walls and to maximise weightbearing on the less painful structures at the back of the foot.
- Once pain is controlled, blood should be tested for insulin, adrenocorticotrophic hormone (ACTH), and glucose to aid the diagnosis of EMS and PPID.



**EVA floor mats cut to size and secured with duct tape provide good support for laminitic feet.**



**X-ray showing 15 degree dorsal rotation (red), 19 degree palmar rotation (green), sinking (yellow) and insufficient sole depth (blue) following laminitis induced by corticosteroid use.** *Credit Pat*

## EQUINE METABOLIC SYNDROME

EMS is not a disease but a cluster of factors that increase the risk of laminitis. Often seen in “easy keeper” breeds including native ponies, Arabians and Iberians, a horse with EMS will usually have:

- Obesity and/or regional fat deposits, e.g. a cresty neck, filled supraorbital hollows, fat behind the shoulders, around the tailhead or around the sheath/udder;
- Insulin dysregulation - hyperinsulinaemia or insulin resistance; and
- A predisposition to or history of laminitis.

Diagnosis is based on blood tests showing above normal insulin levels after fasting or eating low sugar hay, or an oral sugar test, plus symptoms and history. However, tests are often falsely negative so a normal result does not rule out EMS. Glucose may be tested but is usually normal.

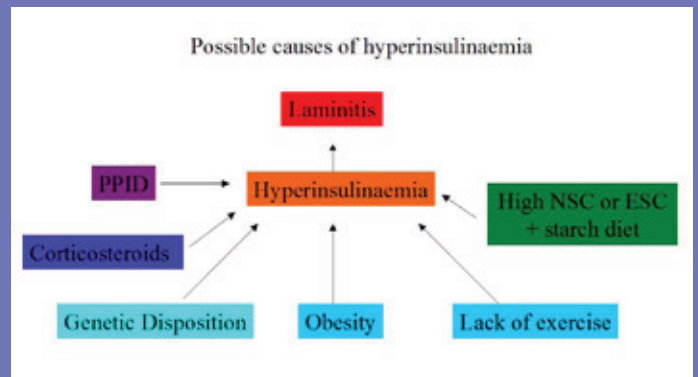
Treatment is weight loss if necessary, a low sugar/starch diet that provides all essential nutrients, and exercise when the horse is able. The

human antidiabetes drug Metformin is sometimes prescribed when a horse has high insulin levels and cannot exercise due to laminitis, but drug treatment should not be a substitute for correct diet.

Note that the use of corticosteroid drugs increases insulin levels, and carries a high risk of causing laminitis in susceptible horses.



**This mare with EMS has a large solid neck crest with “sausage-like” fat deposits, a dip in front of the withers, and filled supraorbital hollows. A lack of shoulder definition, gullet along her spine and inability to feel her ribs easily indicate that she is very overweight.**



**Hyperinsulinaemia (above normal insulin levels) is known to cause laminitis.**

## PITUITARY PARS INTERMEDIA DYSFUNCTION

PPID is a progressive disease that starts when dopamine-producing neurons in the brain die, possibly due to oxidative damage, causing the pars intermedia in the pituitary gland to release excessive amounts of several hormones (alpha-MSH, beta-endorphin, ACTH and CLIP), and eventually leading to enlargement of the gland.

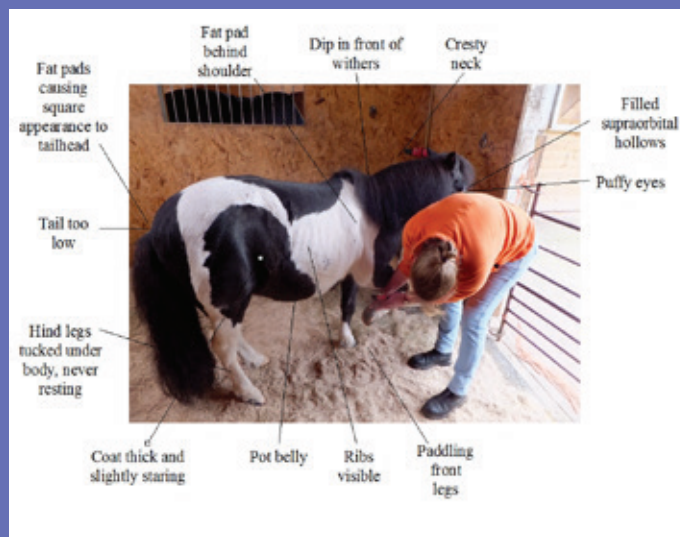
Clinical signs vary between horses and the stage of the disease, and include muscle loss, a pot belly, lethargy, recurrent infections, increased worm burdens, infertility, weight loss, and abnormal sweating; and horses with PPID and EMS may have laminitis, insulin dysregulation, abnormal fat pads, and excess drinking/urination. The long curly coat that doesn't shed is a sign of advanced PPID, but early signs include long hair on the legs, face and neck, and late or patchy shedding. Symptoms are often worse in the autumn.

Early PPID can be hard to diagnose with the tests currently

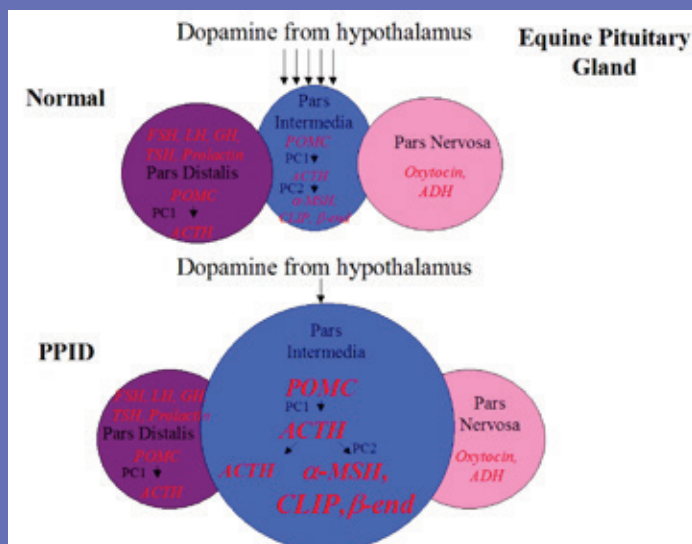
available. Blood tests are often negative and signs of PPID overlap with normal ageing. Diagnosis is based on above normal ACTH plus clinical signs and history. Testing ACTH between August and October may give the best results, using seasonal reference ranges, and the thyrotropin releasing hormone (TRH) stimulation of ACTH may be used outside of these months if resting ACTH results are equivocal. Some experts believe that not all horses with PPID are at increased risk of laminitis, and insulin should be tested to identify those that are.

PPID is treated with daily pergolide, now licensed for horses in many countries as Prascend, to replace the missing dopamine, plus optimised management, with attention to providing a diet that provides all essential nutrients, clipping and rugging if necessary, good dental and foot care, and targeted parasite control.

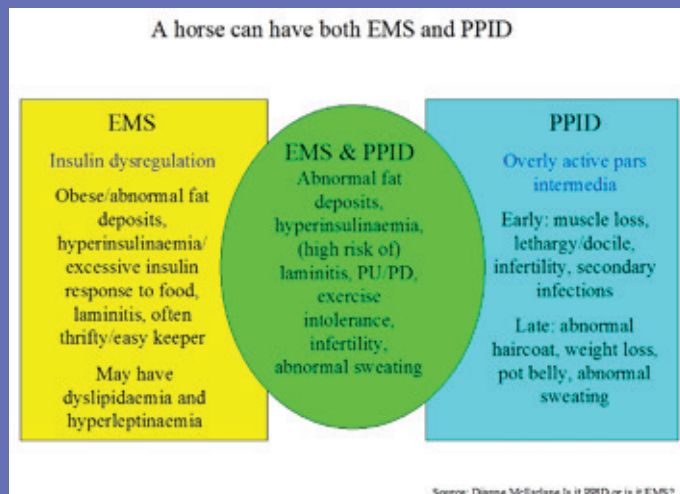
Horses with EMS appear to be at greater risk of developing PPID as they get older, and may have a greater risk of laminitis as they transition from EMS to PPID.



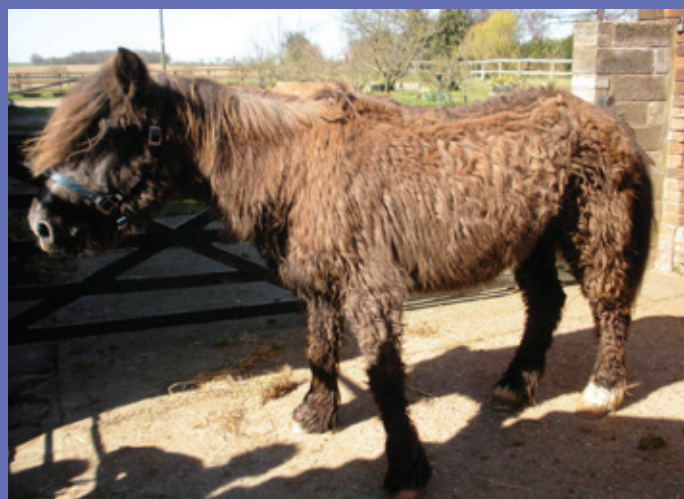
**Nutmeg displaying signs of PPID, EMS and chronic laminitis.**



**Reduced dopamine from the hypothalamus causes an increase in hormone production from the pars intermedia, and consequent increase in size of this area of the pituitary gland.**



Source: Dianne McFarlane Is it PPID or is it EMS?



**Scooby showing the long coat typical of advanced PPID.** Credit Remus Horse Sanctuary

## HOW CAN LAMINITIS BE PREVENTED?

The good news is that many cases of endocrine laminitis can be prevented with careful management and simple daily checks for at-risk horses:

- Keep horses at their correct weight and body condition score. Carry out a hands-on body condition score assessment and check weight using a weight tape, weight calculation, or weigh bridge at least twice a month. Allow horses to lose weight naturally over the winter months if they are likely to gain a little weight in the spring. If weight loss is required, aim for the horse to lose no more than 0.5 – 1% of bodyweight per week. Do not feed less than 1.2% of bodyweight unless under veterinary supervision, and ensure essential nutrients are provided by the diet.
- Feed a low sugar, low starch, high fibre diet supplemented to provide above minimum levels of minerals, vitamins, protein and essential fatty acids.
- Restrict or prevent grazing when grass is growing fast (increased quantity) or is stressed by drought or cold sunny weather (increased sugar). Consider using a grazing muzzle, track system, or strip grazing to limit grass consumption and encourage



movement. See [www.safergrass.org](http://www.safergrass.org) for information about sugar levels in grass.

- Ensure horses are regularly exercised as long as their feet are correctly aligned and stable. If exercise is reduced, consider reducing the energy content of feed – many cases of laminitis follow a reduction in exercise due to lameness, rider illness/holiday, or bad weather.
- Keep feet perfectly balanced and supported, and check regularly for any signs of chronic laminitis. If signs are seen, have x-rays taken and ensure feet are fully realigned as soon as possible.
- Be vigilant for clinical signs of EMS and PPID, and arrange for blood tests if suspicious. The aim is to diagnose and treat these conditions before laminitis occurs.



**A grazing muzzle combined with track system allows horses with insulin dysregulation to socialise and exercise.** *Credit Fiona*

Daily checks that can help early identification of laminitis include:

- Walking the horse on hard ground – there should be no decrease in stride length, no suggestion that the horse is “footy” or “pottery”, and the horse shouldn’t seek out softer ground.
- Turning the horse in a tight circle to the left and right – the turns should be fluid with no reluctance.
- Checking the digital pulse in the pastern or fetlock – it shouldn’t be more bounding than normal.
- Monitoring fat pads – any increase in size or firmness of neck crest, supraorbital filling, fat around the tailhead and udder, or sheath swelling could indicate increased laminitis risk.



**Supraorbital hollows – normal on the left, filled on the right.** *Credit Liz*

If there is any suspicion of laminitis, follow the treatment protocol above. What we know about laminitis has changed significantly in the last few years. For the latest information visit [www.thelaminitissite.org](http://www.thelaminitissite.org) and [www.facebook.com/TheLaminitisSite](https://www.facebook.com/TheLaminitisSite).

About the author: Researcher Andrea Jones founded The Laminitis Site after nursing her Irish cob through laminitis with severe rotation in all four feet. The work of The Laminitis Site is funded entirely by donations and in 2013 The Laminitis Site was registered as a company with charitable purposes: to provide information and education, to carry out research and to care for equids with laminitis. The Laminitis Site’s philosophy of “identify and remove/treat the cause and support and realign the feet” has helped hundreds of horses around the world recover from laminitis. Andrea lives in France with her husband, Dr Martin Lefley, three horses, dogs and cats and enjoys dressage and walking her dogs. 🐾

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