



## New Therapeutic Laser coming to REC

REC has just purchased the first Class IV therapeutic laser for horses in Australia. The Class IV therapeutic laser has been shown to increase circulation, reduce inflammation, pain and muscle spasms. It is useful to treat a wide variety of conditions including:

- Tendon injuries
- Ligament injuries, such as suspensory desmitis
- Muscle pain and inflammation
- Osteoarthritis, including navicular syndrome
- Splints
- Wounds



*From left to right: Dr Ruth Franklin, Dr Rachel Salz, Laura-Jayne Evans and Dr Ilona Bayliss are our staff members that have been trained in laser therapy.*

### OCTOBER-NOVEMBER 2016

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3 Jane Street Randwick NSW 2031  
Ph 02 93997722 Fax 02 93985649  
Email [reception@randwickequine.com.au](mailto:reception@randwickequine.com.au)

#### REC Partner Practices



# New Laser Therapy coming to REC (contd)

## How does it work?

Laser therapy stimulates a series of events at the cellular level, resulting in:

- **Increased oxygen and energy supply to the tissues and accelerated removal of waste products and inflammatory mediators.**
- **Downregulation of pain pathways.**
- **Vasodilation resulting in improved circulation.**
- **Activation of lymphatic drainage (aiding reduction of swelling).**
- **Reduced formation of scar tissue.**

The therapeutic laser uses a variety of wavelengths, each of which targets a specific area. The table on the right shows which wavelength (measured in nanometres (nm)) targets which area or cellular process.

Laser therapy can be used alongside other forms of treatment to accelerate the recovery time for many common lameness disorders in horses. Not only can laser therapy be used as a treatment, it can be used to aid in preventing musculoskeletal injuries too. Just as in people, horses training at a high level get intermittent pain and soreness. Periodic class IV laser application can allow faster recovery and therefore more efficient training.

Laser therapy effect is cumulative so each treatment is complementary to the last at a cellular level. Treatment protocols vary depending on whether it is being used for injury treatment or prevention, the type of injury and whether the injury is acute or chronic. The laser unit is portable so treatment can be carried out at your yard.

If you think your horse may benefit from laser therapy, please contact our clinic by telephone or email.

The importance of wavelengths	
970 nm	Encourages increased blood flow to the target tissues
905 nm	Increases the rate of release of oxygen from haemoglobin, found in red blood cells, which is delivered to the local tissues
800 nm	Stimulates the cellular enzyme 'cytochrome oxidase', which fuels the energy processing.

*The laser uses different wavelengths to targets specific tissues or cellular processes.*



*Our Equine Sports Medicine and Rehabilitation Nurse, Laura-Jayne Evans (pictured), will be performing the laser treatments.*

## Equine Cushing's Disease

If your horse has difficulty in losing weight, or suffers from bouts of laminitis, they may be suffering from Equine Cushing's disease and/or Equine Metabolic Syndrome. The following articles will hopefully help you understand more about these relatively common but often misunderstood and confusing conditions.

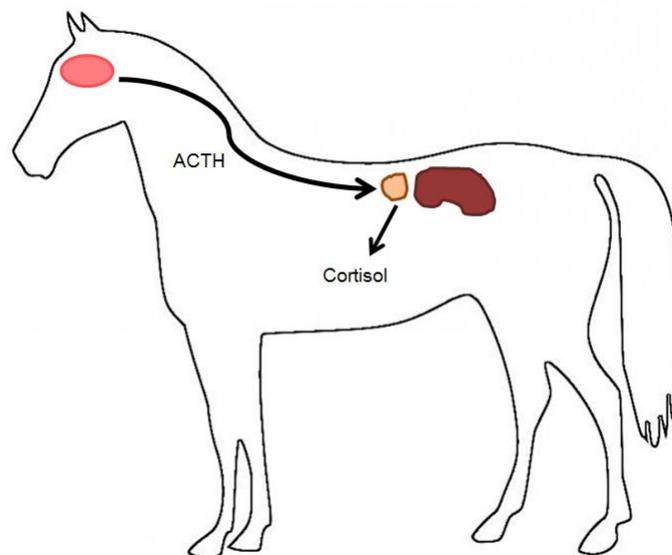
### What is Equine Cushing's disease?

Equine Cushing's disease, also known as Pars Pituitary Intermedia Dysfunction (PPID) is a disorder of the horses' endocrine system (hormonal system). Equine Cushing's most commonly affects pony breeds, but larger breeds can be affected and it is primarily seen in older horses above the age of 15 years.

Equine Cushing's is caused by an enlargement in the pars intermedia (middle section) of the pituitary gland. The pituitary gland is located at the base of the brain and is an important endocrine organ that produces a variety of different hormones. This enlargement of the pars intermedia results in the increased release of several hormones, most notably ACTH (adrenocorticotrophic hormone). ACTH causes the adrenal glands (located near the kidneys) to increase the production of cortisol, a type of steroid. It is this overproduction of cortisol that causes the majority of clinical signs seen in this condition.

### What does Equine Cushing's look like?

There are many clinical signs associated with Cushing's disease. Recurrent, and often unexplained, bouts of laminitis along with an abnormal hair coat are two of the most common clinical signs of a horse with Cushing's.



*An overproduction of the hormone, ACTH, from the pars intermedia of the pituitary gland, located in the brain, causes more cortisol to be released from the adrenal glands, located near the kidneys, leading to the clinical signs seen with PPID.*

Other signs include a pot-bellied appearance, ravenous appetite, increased urination and drinking, lethargy and a decrease in the immune system seen as recurrent skin and respiratory infections, as well as dental disease and an increased susceptibility to worms. Cushing's horses can also get an abnormal deposition of fat above their eye where normal horses would have a depression (this depression can often be seen moving when a horse chews) and can also show wasting of their skeletal muscles.

Abnormal hair coat can vary from mild changes in shedding pattern to the development of a long (up to 10cm) thick and wavy overgrown coat. This strange coat characteristic is known as 'hirsutism' and is due to the enlarged pars intermedia of the pituitary gland compressing the hypothalamus, which is a section of the brain located next to the pituitary gland that regulates body temperature, appetite and seasonal cyclic shedding of hair.



*This is a pony with Cushing's disease. Note the long hair coat (hirsutism) and pot-bellied appearance. Not all PPID cases are this easy to spot, however.*

The link between Equine Cushing's disease and laminitis is still not fully understood but it is the focus of extensive research. It is currently believed that the increased levels of circulating cortisol and cortisol-like hormones may play a major role in the development of laminitis, so too might a metabolic state known as insulin resistance, which we will come to later.

### How do you diagnose Cushing's disease?

In classic cases (i.e. the older pony with hirsutism and recurrent laminitis) a diagnosis can be made on presentation alone, but not all Cushing's cases have obvious clinical signs - often they are very subtle. When investigating subtle signs, or when a definitive diagnosis is wanted, there are a couple of tests your vet can conduct.

The most common test is to measure resting ACTH. This is a simple once off blood sample that gives fairly reliable results in regards to diagnosis, as well as being used to monitor the progression of the condition once treatment has started.

Another common test performed to achieve a diagnosis of Equine Cushing's disease is the Low Dose Dexamethasone Suppression Test. This test involves taking a blood sample from the horse to get a base-line measure of circulating cortisol. After the blood is taken, a dose of dexamethasone is administered into the muscle. Dexamethasone is a steroid that in normal horses will cause suppression of circulation cortisol levels. In horses affected by Cushing's disease the body is unable to respond properly to the injection and cortisol levels remain elevated. A second blood sample is taken about 20hrs after the injection of dexamethasone. If the cortisol levels have not decreased then a diagnosis of Cushing's is made.

### Treatment and Management of Equine Cushing's disease

Unfortunately there is no cure for Equine Cushing's but we can help reduce the effects of the disease.

Pergolide is the most commonly used Cushing's medication. It comes in tablet form that can be crushed up and fed in feed or hidden inside a treat and is given once per day. Pergolide is a dopamine agonist (dopamine inhibits the pars intermedia and hence helps to reduce its size and thus reduce over production of cortisol) and has been reported to be up to 80% successful in reducing the severity of signs seen in Cushingoid horses. Other medication such as cyproheptadine and trilostane can also occasionally be considered if results with pergolide are disappointing.

# Equine Metabolic Syndrome (EMS)

Equine Metabolic Syndrome (EMS) is a veterinary term used to describe horses presenting with obesity and/or large regional fat deposits (regional adiposity), insulin resistance and recurrent laminitis. EMS usually affects young to middle aged horses and is especially seen in native pony-type breeds.

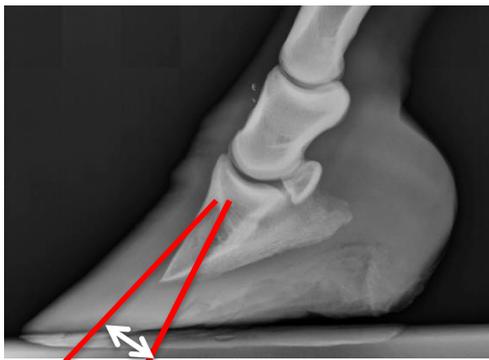
Horses with EMS are often described as a 'Good doer' – they maintain weight despite little feed. Large regional fat deposits can be seen around the shoulders, at the base of the tail, around the mammary glands in mares and in geldings a fat filled and enlarged sheath may be seen. A large, thick and 'cresty' neck is also very commonly seen in EMS horses and ponies.

Like in Cushing's disease, the association between EMS and recurrent laminitis is still not fully understood but it is believed that there is a strong and plausible link between the occurrence of insulin resistance and the predisposition for laminitis to occur.



*Pergolide is the first line treatment choice for a horse with Cushing's disease. It comes in tablet form and is given just once a day.*

Management is just as important as medicating Cushingoid horses. Frequently inspecting for wounds and the evidence of any kind of infection and ensuring prompt veterinary attention is very important as affected horses may have reduced levels of immunity and often need more intensive and prolonged treatment than other horses. Regular farrier visits and dental checks along with routine vaccinations and a de-worming program involving frequent faecal egg counts are vital to ensure the health of Cushing's affected horses. Simple things like clipping out excessive hair will also go a long way in ensuring the comfort of affected horses especially in hot weather.



*Laminitis is a common outcome for horses with PPID. Radiographs can be taken to measure the extent of pedal bone rotation.*



*The appearance of a 'cresty' neck, as seen in this picture, is a classic sign of a horse that may have EMS.*

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## So what is Insulin Resistance?

Insulin resistance is a reduction of the horse's ability to respond appropriately to the hormone insulin. Insulin aids the movement of glucose from the blood into the body's cells where it is stored. As a result of insulin resistance this important mechanism no longer functions properly. The body tries to counteract its loss of sensitivity to insulin by producing more and more insulin. This elevated level of insulin tells us that insulin resistance is occurring.

Similar to people with type-2 diabetes, obesity is the primary cause of insulin resistance in horses. The main mechanism in which obesity causes insulin resistance is via the action of a variety of hormones known as 'adipokines' which are produced by fat tissue (adipose tissue). These hormones normally down-regulate insulin, but when they are produced to excess by larger than normal deposits of fat, their down-regulatory action is too much for the body to cope with and insulin resistance occurs.

## Why are ponies so susceptible to EMS?

Their highly efficient metabolic systems would have allowed them to store large amounts of fat during the summer months so they could draw on these reserves during the winter months to survive. Arriving into autumn and winter in a relatively obese state would create a situation where the pony is relatively insulin resistant (as we have previously learnt). This would create a higher than normal level of glucose in the blood (remember that insulin removes glucose from the blood and stores it in cells) which would allow the pony to use glucose for important organs like the brain and divert it away from structures of lesser importance. By the end of the harsh winter the pony would have used up its fat reserves and

the relative insulin resistance would have disappeared along with the fat. The pony would once again be ready to eat fresh green spring grass full of carbohydrates and sugars without any issues.

It was during domestication when this all went wrong. Ponies now have access to far more calories than they were designed to cope with due to us feeding concentrates, hay/haylage and even just from the improved pastures. Domesticated ponies now rarely truly experience harsh conditions so don't have their insulin resistance down regulated by the loss of fat reserves.

## How is Equine Metabolic Disease diagnosed?

History alone is often highly suggestive in EMS cases. However, some of the clinical signs being quite subtle and easily confused with Equine Cushing's Disease, so it is important to firstly rule out the presence of Cushing's. After this has been ruled out, the next step is to try and confirm EMS, but this is often harder than it sounds. There is not a definitive test for Equine Metabolic Syndrome so your vet may use a variety of blood samples looking mainly for glucose and insulin concentrations.

## Equine Metabolic Disease treatment and management

The key to treating and managing EMS is weight loss and exercise. Obese horses should be placed onto a diet solely composed of hay plus a vitamin and mineral supplement with no access to pasture. The hay should be mature grassy hay with a high stem to leaf ratio (i.e. old dry grassy hay with lots of stem). If the hay is still too rich, then it should be soaked in water for at least 30 minutes to leach out the soluble sugars. If in doubt, it's better to soak than not to soak. Avoid haylage at all costs, as it is just too rich.

Diet restriction is an important part of managing EMS, but please consult your vet before doing so. Severe calorie restriction can cause worsening of insulin resistance and other severe conditions as hyperlipaemia.

Exercise is the other crucial component in tackling EMS. If your horse is laminitic, then it is recommended that this is managed before exercise is commenced. If sound, the pony should begin a program of 2-3 sessions per week consisting of 20-30 mins of moderate intensity work. Intensity and duration should be gradually increased over time. Exercise and weight loss has also been shown to directly reduce insulin resistance in humans.

## Confused?

Don't worry, Equine Metabolic Disease and Equine Cushing's are both very similar and very confusing diseases. It is important to discuss your horse or pony's condition with your vet to ensure the correct diagnosis is made before starting any management changes or treatment. The earlier appropriate treatment and management is started, the better the prognosis.

## Welcomes and Farewells

We would like to welcome our three new interns: Drs Kate Robson, Sarah Smith and Tate Morris. Kate grew up in the Hawkesbury and graduated from Wagga Wagga. Sarah joins us from the UK having graduated from the University of Edinburgh. Tate has made the move from the USA after completing his degree at Cornell University.



*Drs Kate Robson (top left), Sarah Smith (above) and Tate Morris (left) join the team.*

Sadly, we have had to say goodbye to Drs Jenni Hawke and Christian Byrne, both of whom completed their internships here. Jenni will be moving to Singapore and Christian has moved back to his home county of Yorkshire in the UK to start his new job. We want to thank both Jenni and Christian for their hard work and wish them all the best for the future. Dr Chris Elliott has also left the team to pursue further opportunities, mostly overseas in the sport horse field.