

# Cushing's Disease Threatens the Health of the Older Horse

BY MARK LLEWELLYN

Horses are undoubtedly living longer. Proof of this rests in the marketplace. Feed companies formulate and manufacture specialized feeds for aged horses, with each touted as being chock full of easily digestible, energy-rich ingredients. Booksellers stock texts targeted specifically toward caring for older horses, all brimming with what to expect as horses advance toward elderliness. The last decade has seen the establishment of several retirement farms offering horsemen a safe haven for their aged charges when acreage is in short supply. Although the opportunity to have a horse or pony around for years longer than ever before has innumerable benefits, extended equine life expectancy does have its downsides. Illnesses that commonly plague aged horses are becoming more prevalent. In particular, the number of horses diagnosed with Cushing's disease has increased steadily over the last several years.



Photo by Mark Lewellyn

*A long, curly hair coat that does not shed out in the spring is often the first indication that a horse suffers from Cushing's disease.*

## The Endocrine System

The network of organs responsible for the production and distribution of hormones is the endocrine system. Hormones have a host of responsibilities, including regulation of metabolism. When endocrine processes are executed unfailingly, the body is said to be in hormonal balance. When amok, however, hormonal equilibrium can quickly go haywire, and this chaos can come in the form of Cushing's disease.

The pituitary gland is often called the "master gland" because it orchestrates body-wide endocrinology. An abnormal growth in the pituitary, usually an adenoma, causes the overproduction of certain hormones. An adenoma is any benign tumor that originates from glandular tissue. When an adenoma erupts from the pituitary gland, excessive production of adrenocorticotrophic hormone (ACTH) occurs. The surplus ACTH spurs the adrenal glands to manufacture excessive cortisol, a hormone that, when off-kilter, can negatively impact numerous body systems.

Presence of an adenoma and accompanying hormone fluctuations often lead to equine hyperadrenocorticism, more commonly called Cushing's disease or simply Cushing's. The condition affects primarily middle-aged or geriatric horses, those in their late teens, twenties, or thirties, but horses as young as seven years old have been diagnosed. Some researchers believe that a preponderance of ponies is afflicted, but the disease is as widespread among horses as it is among ponies. Clinical misdiagnosis may occur more often in ponies due to their propensity for unusually dense hair coats and laminitis, two signs of Cushing's disease.

## Telltale Signs

Most horsemen begin to suspect a problem in aged horses in late spring and early summer when affected horses fail to shed their wooly winter coats. Excessive hair growth, called hirsutism, and the inability to cast winter coats are the primary signs of Cushing's disease. The long coat often leads to unusual patchy or full-fledged sweating in mild temperatures that would not otherwise induce sweating. Other changes in hair include the lightening of black and dark brown coats to an orangish-brown. A general dulling of the coat may also occur regardless of how well the horse is groomed or fed. Before more noticeable coat abnormalities appear, cushingoid horses may have subtle changes, such as an abnormally thick winter coat or

the retention of guard hairs under the chin and on the neck long after the winter coat has been shed.

In addition, horses may experience changes in body weight. Although both weight loss and gain have been seen in horses with Cushing's syndrome, more horses seem to become overweight. Weight loss must not be confused with decreased muscle tone, a common sign among affected horses. Loss of muscle tone may be especially apparent in the neck, which will manifest as thin and knife-like, and over the topline, which may contribute to a saggy, pot-bellied appearance. Displaced fat is also a sign of Cushing's syndrome. Unusual accumulation of fat along the crest, over the croup, and around the eyes may occur. Horses typically have hollows just above their eyes. In cushingoid horses, these indentations are often packed with fat.



Photo by Robin Stanback

## She's Adored—And Should Be!

She is a granddaughter of a champion, and a daughter of a stakes-winning mare. Her sire is the indomitable Seattle Slew, winner of racing's coveted Triple Crown. Carrying on the family tradition, she is the producer of a stakes winner. Her name is Adored—it simply could not be more appropriate. The love she has generated in her owners, racing fans, and caretakers is still apparent today. At 22 years of age, slowed by founder and the ravages of Cushing's disease, she is still treated as racing royalty in the "hospice field" of John Williams' Elmwood Farm in Versailles, Kentucky.

Owned and raced by the late Ethel D. Jacobs, the mare was a star on the race-track for Hall of Fame trainer Laz Barrera, winning or placing in 12 graded stakes races in 1984 and 1985. Among other races, she won the Santa Margarita Invitational Handicap, triumphed in the Milady Handicap two consecutive years, and placed third in the Breeders' Cup Distaff. She amassed over \$875,000 in career earnings. Mr. and Mrs. Lewis E. Wolfson fell under her spell and purchased a part of her. She produced multiple winners for her owners and was assured a treasured place in their broodmare band when she foundered severely at the age of 14. It was not long after the founder weakened her that she began showing signs of Cushing's, a disease as confounding as it is difficult to treat.

"She is one of the younger mares I have seen with this disease, and she certainly has to be the hairiest. I have never seen a mare with longer hair. Her coat can be four inches long," said Mr. Williams.

Jolie McCutcheon cares for the mare and her pasturemate, another retired stakes-winning mare. She explained, "I have body clipped a number of horses in my career and usually it takes about three or four hours. It took me three and a half days, five hours a day for the first three days, to clip Adored. Her hair was just so long I couldn't get the clippers through it. She was a sweetheart, though. She behaved like a lady the whole time."

The mare is kept at pasture and fed a carefully balanced feed to complement her forage. Her hooves are tended every 30 days. In the summer months, she is clipped as often as necessary to help keep her as cool and comfortable as possible. "Horse care is a pretty commonsense sort of thing," Mr. Williams explained. "I wouldn't want to wear a heavy coat in the summer, so I sure don't want to see one on her."

Mr. Williams said that he and his staff are proud to be part of this mare's life. "She deserves a comfortable retirement, and we are very glad to provide it for her. I have to compliment her owners on their devotion as well. Providing a well-deserved rest for such a grand mare is a privilege."

Some horses will exhibit increased appetite and thirst, leading to unusual amounts of urine production. Caretakers may be confronted with bone-dry water buckets in the stalls of horses that once drank only average quantities of water. A healthy horse sustained on an all-forage diet in a moderate environment will generally drink about five to eight gallons of water daily. Horses with Cushing's disease, however, drink much more. Instances of horses drinking more than 20 gallons of water daily have been

baseline cortisol reading is derived from a blood sample. The horse is then given dexamethasone, a potent steroid that arrests hormone production. Twenty-four hours after administration of dexamethasone, a second blood sample is harvested for comparison. In normal horses, administration of dexamethasone results in a marked decline in cortisol levels. Horses with Cushing's, however, are usually unresponsive to the dexamethasone, and levels remain the same or escalate due to the inability of the pituitary to

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documented. Because of the elevated water intake and subsequent increased urination, stalls may become unusually wet and difficult to clean.

More debilitating than signs suggestive of the disease are two secondary complications: laminitis and diabetes mellitus. In a study of 21 affected horses, 24% were laminitic, and 38% had signs indicative of diabetes mellitus. Although the cause of the laminitis is unknown, it has been speculated that elevated cortisol levels result in constriction of blood vessels nestled in the hoof capsule. A second school of thought centers on insulin dysfunction. Insulin is a vasodilator, a substance that enlarges blood-carrying structures such as veins, arteries, and capillaries. A horse with insulin resistance may experience stricture of blood channels, causing insufficient flow to peripheral structures such as the hoof. Recurrent episodes of laminitis often lead to solar abscesses and displacement or rotation of the coffin bone.

Diabetes mellitus is a chronic syndrome caused by insufficient levels of insulin within the body or the resistance of target organs to use insulin properly. In addition to increased thirst and urination, signs of diabetes mellitus include recurrent bacterial or fungal infections and delayed wound healing. The persistently high levels of cortisol may suppress the immune system, increasing the susceptibility of horses to infection.

### **Diagnosis**

Surefire diagnosis of Cushing's disease is challenging. Simple blood profiles may unmask characteristics of the syndrome, such as hyperglycemia and increased plasma triglycerides, but horses with Cushing's disease do not always have these spikes. In addition, measuring hormone levels in the blood will not provide a definitive diagnosis. A rare adrenal gland tumor can also bring about hormonal surges similar to those in cushingoid horses.

The most reliable method for diagnosing Cushing's disease is the dexamethasone suppression test (DST). First, a

slow hormone production. The dexamethasone suppression test is not risk-free; one liability is resultant laminitis.

For horses susceptible to laminitis, the thyrotropin-releasing hormone (TRH) stimulation test is frequently used. TRH activates the release of several hormones, including cortisol. In horses suspected of having Cushing's disease, the cortisol levels may increase significantly within 15 minutes of intravenous administration of TRH.

Measuring serum concentration of ACTH was once thought to provide an accurate diagnosis of the disease. When the results of ACTH concentration findings were compared to DST and TRH test results, however, inaccuracies were encountered, so diagnosis is not assured with this test.

### **Treatment**

There is no cure for Cushing's disease. However, measures can be taken to treat the effects of the disease. The two drugs most commonly used are pergolide mesylate (also known simply as pergolide) and cyproheptadine. Pergolide suppresses the secretion of ACTH by the pituitary gland, thereby decreasing cortisol production. The efficacy of pergolide is much greater than that of cyproheptadine, as illustrated by research completed at the University of Michigan.

Under the name The Michigan Cushing's Project, researchers gathered a group of 77 horses confirmed to have Cushing's disease based on characteristic clinical signs and the results of either the DST or the TRH stimulation test. The mean age for the test population was 22.8 years, with a range of 12-34 years. Baseline endocrine test results were compared to results following a six- to 12-month treatment period in which horses were divided into three groups: treatment with cyproheptadine, treatment with pergolide, and no treatment.

Clinical improvement was most apparent in horses dosed with pergolide, although a few horses did respond positively to cyproheptadine. As expected none of the horses relegated to the no-treatment group improved. No adverse

side effects were reported with cyproheptadine. Conversely, several of the horses given pergolide exhibited decreased appetite during the first week of administration.

In field trials, improvement with pergolide has been noticed in as little as three to four weeks. Shedding and increased energy levels are usually the first signs of improvement. Aside from the initial loss of appetite, long-term treatment with pergolide has one significant drawback—cost. The average monthly cost for treatment with pergolide is \$60.

The Royal Veterinary College in the United Kingdom recently studied the effects of trilostane on cushingoid horses. Trilostane blocks the adrenal glands from producing certain hormones. The drug was given once a day to 20 horses diagnosed with Cushing's disease. Following one month of treatment, the excessive drinking and urinating noted in 11 horses prior to trilostane administration resolved. In addition, 19 horses with lethargy gained more interest in their surroundings but did not seem to be particularly more energetic.

## **Because of the predisposition for sole abscesses and laminitis, strict attention must be paid to hooves.**

Fourteen of 17 horses suffering from laminitis prior to dosing showed stable condition or improvement of the hoof ailment after being given trilostane. Lameness improved in six horses to the extent that they were discontinued from all nonsteroidal anti-inflammatory medications. Three of the 20 horses exhibited acute laminitis with rotational changes to the coffin bone prior to receiving the medication; laminitic symptoms did not respond to trilostane in these horses. Further research is being conducted on trilostane to determine safety and long-term efficacy.

### **Dietary Considerations**

Astute feeding management also has a place in the treatment of Cushing's disease. Diets high in starch, such as those containing typical sweet feeds, may exacerbate diabetes mellitus and increase the risk of laminitis. Why? As starch is digested, large amounts of glucose enter the bloodstream. Elevated levels of circulating glucose can alter secretion of cortisol, thus negatively affecting metabolism and contributing to disorders such as Cushing's syndrome and laminitis. Therefore, low-starch diets are typically recommended.

One product that may help Cushing's horses is Re-Leve, a high-energy, low-starch feed. The energy in Re-Leve is supplied from highly digestible fat and fiber sources. This feed

contains optimal levels of protein, vitamins, and minerals for horses of all types and uses. For more information on Re-Leve, visit [www.re-leve.com](http://www.re-leve.com).

Supplementation with chromium has been implicated in the reversal of hyperinsulemia, or insulin resistance, in aged horses. A handful of researchers believe insulin resistance may provoke laminitis. If chromium increases insulin sensitivity, horses may be less prone to laminitis, one of the most serious complications of Cushing's disease. Veterinarians often prescribe Metaboleeze, a chromium-based supplement, to horses with Cushing's disease. Metaboleeze is marketed by Kentucky Performance Products (1-800-772-1988).

Additionally, vitamin E and C supplementation may recharge the immune system. In particular, vitamin C levels are known to decline in aged horses, so supplementation may be helpful. Daily administration of vitamin C can be costly. To keep expenses at a minimum, some veterinarians advise giving it only when the horse has an infection or wound, or when the immune system is otherwise compromised.

### **Other Management Tips**

Following diagnosis, horses with Cushing's disease should be afforded special care. Because of the predisposition for sole abscesses and laminitis, strict attention must be paid to hoof care. Regular trimming or shoeing at four- to six-week intervals is imperative. All attempts to reduce the likelihood of laminitis should be implemented, including gradual changes in diet and limited exposure to carbohydrate-rich spring pastures. On the veterinary front, regular deworming is paramount. Some cushingoid horses have a lowered immunity to parasite damage, due in part to loss of intestinal wall integrity. A qualified dentist should examine the horse once or twice annually for dental problems. Dentists should refrain from floating the teeth of aged horses too aggressively, as there may be little tooth left to erupt from the gum line. Abscesses noted by the dentist should be treated quickly by a veterinarian. In fact, infections of any sort should be treated promptly by a qualified professional.

In an effort to make them more comfortable in warm weather, horses with Cushing's disease should be body clipped. This is especially important for horses that cannot escape the midday sun of summer. Thorough grooming is also necessary. Horses with Cushing's disease may be more susceptible to skin problems in the summer months due to the unnatural length of the hair coat. Owners should be on the lookout for skin infections such as rainrot or dew poisoning and should treat them aggressively.

Cushing's disease is not a death sentence. Despite the fact that there is no cure, there are several management practices that can keep an affected horse in use and in good health for many years following diagnosis. ☺☺

# The proof is in the performance.



Photo by Shawn Hamilton

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