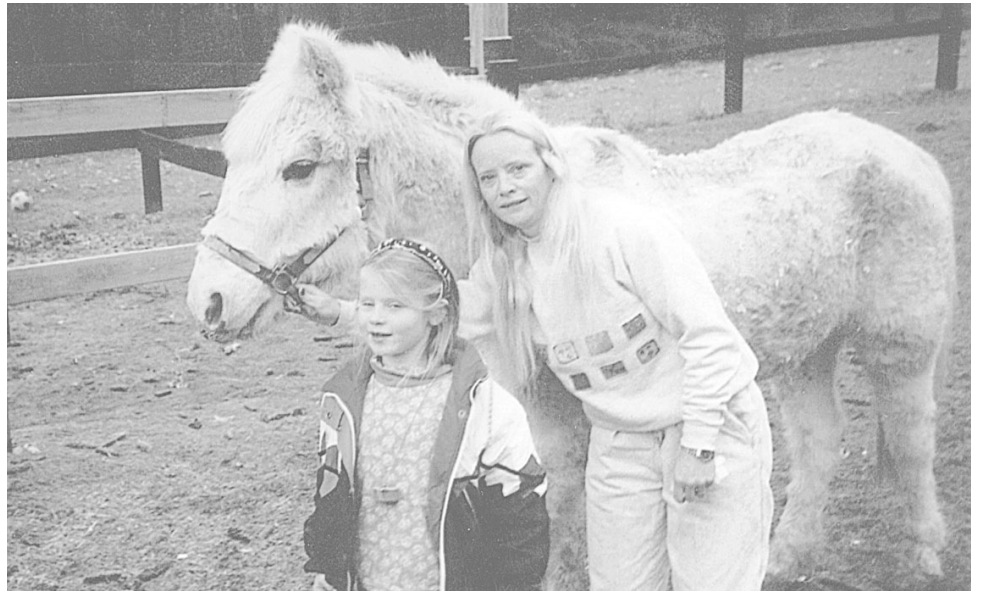




April, despite twice daily grooming, the lackluster Cushinoid coat persists.



Donna and Ashley White with Aquila Mighty Mac, a Cushinoid pony.

# —She Has Cushings Disease—

## Diagnosing, Treating & Living with Cushings

By Sue Brander

**In** the spring of 2000, we moved our family and three Morgan horses from Connecticut to upstate New York. It was a great year for our 20-year-old Queen of The Herd, April. She was my daughter Sarah's 4-H horse in her young years, and, as an older and wiser mare, she taught dozens of children to ride. In 1992, when she was twelve years old, she foundered on second cutting hay. Two years later, she foundered again, apparently a reaction to the antibiotic prescribed to treat Lyme Disease. Instead of gradually bringing the medication up to strength, she was given a full dose. Within hours, she was foundering badly. Both times, she recovered enough to continue her day job with the children she so much loved, and Sarah took her on occasional trail rides near home. When we moved to New York, she was twenty years old, and we decided it was time to take April back a notch and limit her family work to a walk in the harness, with the lightweight jog cart.

That fall, April had a devastating decline. One day, I went out to the pasture to call her in for the evening, and I thought she would not make it to the barn. I needed to know what my options were.

She never really shed out her coat the following spring. Still, she had a good summer, and made a few friends among the children from surrounding farms. In the Fall of 2001, she started that familiar downhill slide. This time we were ready to fight on all fronts. We bought the vitamin supplements. We also used another vitamin product, recommended for founder.

Sarah began to suspect the dreaded Cushings Disease. One late summer day, Carl Lange, the blacksmith, came on his regular rounds, and we were talking about Cushings. All at once, we all noticed a fatty deposit near the point of her left hip. "That shouldn't be there," Carl said. Right then, Sarah decided to have her tested for Cushings. April's numbers were well beyond the normal range. We were into a whole new era of managing April's quality of life.

A Cushings diagnosis is no longer a death warrant for the horse. In the past decade significant progress has been made in managing this disease. While there is no known cure, we have learned a great deal about symptoms, diagnosis and treatment. We have also learned about earlier misconceptions. In the early 90's, when the word "Cushings" began to surface in the vocabulary of horse owners, it was first thought to be breed specific to Morgans. It is not. All breeds are subject to this disease. This condition can affect all domestic equines, including ponies, Miniature Horses, donkeys and mules. Likewise, ten years ago, it was thought that Cushings was exclusively an "older horse" disease. It is not. Although horses fifteen years and older are more likely

to develop this disease, Cushings attacks horses of widely varying ages. It has been diagnosed in horses as young as seven years.

### What is it?

Writing in the December 2000 issue of *Horse Journal*, Dr. Eleanor Kellon defines Cushings as follows:

"Cushings syndrome is a collection of clinical signs and symptoms that are the result of hormonal imbalance. These are caused by either overactivity of the pituitary gland or a tumor in the gland itself."

The pituitary gland is Grand Central Hormone Management for horses. It tells the adrenal glands how much of which hormones to produce. Therefore, when the pituitary gland malfunctions, hormone production goes wildly awry. The disease was named for Dr. Harvey Cushings, the American surgeon who did the early research on the human brain and pituitary gland. Technically, Cushings Disease is a disease of the adrenal glands in dogs and humans. The equine condition is referred to as Cushinoid, and affects the pituitary gland. The distinction is important, because the drugs that treat adrenal gland disease in dogs and humans do not work at all for equines.

Some researchers believe the root cause of this growth of the pituitary gland is a lack of dopamine release from the hypothalamus. Dopamine inhibits the "pars intermedia" --- or middle part --- of the pituitary gland. If the body's supply of dopamine is inadequate, the pituitary gland begins to enlarge. (Dr. Robert A. Eustace, abstracted from the veterinary journal *In Practice*, 1991, Vol, 13, No. 4, July, pp. 147-148).

### What does it look like?

The horse owner is in the best position to notice changes which may indicate the onset of Cushings. Typically, the signs of Cushings develop over several years. Early diagnosis does improve the prognosis. Symptoms include:

- Weight loss
- Filling, or fat deposit above the eye
- Dull eyes
- Loss of coat luster
- Muscle wasting, especially along the top line
- Fat deposits in odd places
- Hirsutism (excess hair growth)
- Excess water consumption and urination
- Vulnerability to parasites and respiratory infections
- Slow healing
- Laminitis (founder)
- Inappropriate udder development or milk production

Some horses that have Cushings will develop laminitis. Once that happens, the horse becomes more vulnerable to abscesses. The prognosis for the foundered horse is not

as good as for the horse who has not developed founder.

The immune system will become suppressed in the Cushings horse. Typically, the Cushings horse will suffer acute incidents in the autumn of the year. This is when laminitis most often develops in Cushings horses (as well as some well non-Cushinoid horses). This is because the pituitary gland is activated by the pineal gland, which is light sensitive. As the days shorten, the pineal gland tells the pituitary gland to wake up and get busy. Since the Cushings pituitary is now acting in a sort of "renegade runaway" manner, the symptoms worsen when the gland becomes more active in the fall of the year.

### Now what?

So, where does this leave us with our beloved family mare? First of all, she's alive and happy. And I cannot emphasize that enough. The first time April foundered, many of our friends exclaimed, "Put her down! She'll be miserable for the rest of her life." That turned out to be totally false. April has had ten very good years since her first founder incident. It wasn't until ten years later that we even began to suspect she had Cushings, and we cannot say for sure when in that decade she developed the disease.

This disease is very inconsistent in symptoms presented. April has never consumed more water than the other horses in our barn. She is not vulnerable to respiratory infections. She heals very quickly. She had a big winter coat last year, but she always grows the thickest coat in the barn, and we have always attributed that to her high percentage of Old Vermont Morgan bloodlines. She never lost weight, and she has no fat deposits over her eyes. Our first big clue was her failure to shed out well in the spring of 2001. The second clue was the fat deposit the blacksmith pointed out in August of that year. This failure to present consistent symptoms is a serious challenge even for the watchful owner. Dr. Barb Schanbacher of Cornell University's Endocrinology Laboratory said, "Most horses present only three or four of the symptoms."

### But Is It Cushings?

The symptoms listed above could come from many sources, not least of which is malnutrition. Therefore, it is important to test for Cushings, and now we can do it. There are four somewhat reliable screening tests for Pituitary Cushings. There is a form of Cushings Disease that is caused by obesity, not by a pituitary tumor. These screening tests help identify Pituitary Cushings.

**The Insulin Test.** Cornell's Endocrinology Report says, "A high serum insulin concentration is a fairly sensitive indication of a pituitary adenoma in the horse." The Cornell Endocrinology Laboratory sets the baseline or norm for insulin in the blood of the horse

between 8 and 30 micro international units per milliliter of blood. April's insulin test showed she had 275.15 micro international units of insulin per milliliter of blood. Or, as Sarah exclaimed, "She's off the charts!"

**The ACTH test.** This test measures the amount of adrenocorticotrophic hormone in the blood serum. (The pronunciation challenge has led to the acronym ACTH, which solves the linguistic problem.) ACTH causes the release of cortisol. It is not the same as cortisol.

Cornell lists the baseline for ACTH as 8 to 35 picograms per milliliter of blood. April had 188 picograms per milliliter. We thought that was off the charts, but Donna White of White Haven Farm in Upton, Massachusetts had a pony who tested at 606. However, the Cornell literature further cautions that a low ACTH reading does not rule out Cushings. So, the cautious owner would do well to perform at least two of the four available tests to corroborate a finding.

**The Dexamethasone suppression test.** The Dexamethasone suppression test is used to determine whether or not the horse has normal suppression of cortisol production after being given Dexamethasone. In this test, the veterinarian injects Dexamethasone and measures the level of cortisol in the blood before giving the Dexamethasone and again 19 to 24 hours later, then compares the two results. A normal horse will have low levels of cortisol at 19 - 24 hours. Most horses with Cushings have decreased feedback on the pituitary telling it to stop producing ACTH, so they will have high levels of cortisol when they should not. This test has a potentially serious drawback. Dr. Belinda Thompson cautions that Cushinoid horses can develop acute laminitis in response to an injection of Dexamethasone. While this test is extremely accurate, it may not be safe for all these horses.

**The TRH stimulation test.** This test is used to determine whether the pituitary gland is being stimulated to produce ACTH when it wouldn't be in a normal horse. TRH is thyrotropin releasing hormone. This hormone stimulates production of TSH (thyroid stimulating hormone) in the normal horse. In many horses with Cushings disease, the TRH stimulates ACTH release as well as TSH release, so increased levels of cortisol are expected in Cushings horses given TRH. The veterinarian takes a baseline blood sample, then injects TRH. Blood samples are then taken at 15 minutes, 30 minutes, and 60 minutes post injection of the TRH. If a tumor is present, the cortisol level will increase within fifteen to forty-five minutes. Dr. Barb Schanbacher of Cornell cautions, "This test seems to be about seventy percent accurate and specific. However, if the horse tests in the normal range, that does not mean the horse does not have Cushings." So, this test is not necessarily definitive. ➔

**Thyroid tests.** Because horses with pituitary tumors often have associated thyroid hormone abnormalities, thyroid hormone testing is often included or added to the testing program for an individual with suspected or confirmed Cushingoid disease. T4, or a combination of T4, Free T4 and T3 are usually requested. We had our veterinarian do a thyroid test, and April's numbers were in the normal range. Dr. Belinda Thompson, a veterinarian at Cornell University, said, "Most veterinarians will request a thyroid test to establish whether the thyroid is functioning properly. If the results are low, a thyroxin supplement is needed. The horse probably will not improve without it. In fact, thyroid supplement alone has shown some benefit early in the course of this illness."

### Live with It

The best news about Cushings Disease is that it can be managed. A horse can live with it for a very long time, and enjoy a good quality of life. In fact, we now suspect April has had the disease for some time, but we did not know it.

Monitor your horse's weight. An obese horse is laminitis waiting to happen. Keep your horse on the leaner side. Eliminate the sugar content from the horse's diet. Even oats, bran and green grass can have too much carbohydrates and or sugars for Cushingoid equines. A horse with an abnormally high insulin count should not be getting a lot of sugar or starch in its diet. Insulin resistance is a frequent component of this disease. The horse's own insulin is unable to properly metabolize the sugar. For the "insulin resistant horse" --- who cannot handle sugar --- it becomes important to eliminate sugar sources from the diet. "Even a handful of sweet feed seems to be able to cause laminitis in some of these horses," Dr. Thompson observed.

Cushingoid horses should also be kept off rich grasses. A dirt paddock is just what the doctor ordered. If that is not possible, grazing muzzles are an alternative. Feeds such as beet pulp and alfalfa pellets are strongly recommended, because they supply energy, without causing sudden spikes in the blood glucose level. Beet pulp is what is left of the beet after the sugar is extracted. As recently as December, 2000, it was believed that beet pulp was not appropriate for Cushingoid horses, because there is some residual sugar in it. Since that time, trials have been conducted, determining that beet pulp is safe for the Cushingoid horse. However, it often comes with molasses on it, so beware, and try to find a source WITHOUT the added molasses. Look at the list of ingredients, it should NOT contain sugar, glucose or any sugar by products. We made two phone calls and found a source without molasses. If you cannot get beet pulp without molasses, Dr. Belinda Thompson recommends finding out how much molasses is in the brand you buy. If necessary, call the manufacturer. Some brands have a very low percentage --- 5% or less --- of molasses, and those are preferred. Dietary management is very challenging.

Morgans are notoriously "easy keepers," requiring very little to maintain their weight. In the 18th and 19th centuries, when there wasn't a lot of grain to spare, this was considered an asset. In the 21st century, we have such a wealth of grains, the owner must exercise restraint, because the horse probably will not. At our new farm in New York, the summer pastures are rich with grasses. We quickly learned we had to adjust our feeding routine. In summer, we now give the horses

just enough grain so they think they had some --- because, after twenty years on the lean pastures in Connecticut, they expect it. April will probably have to learn to expect a different diet.

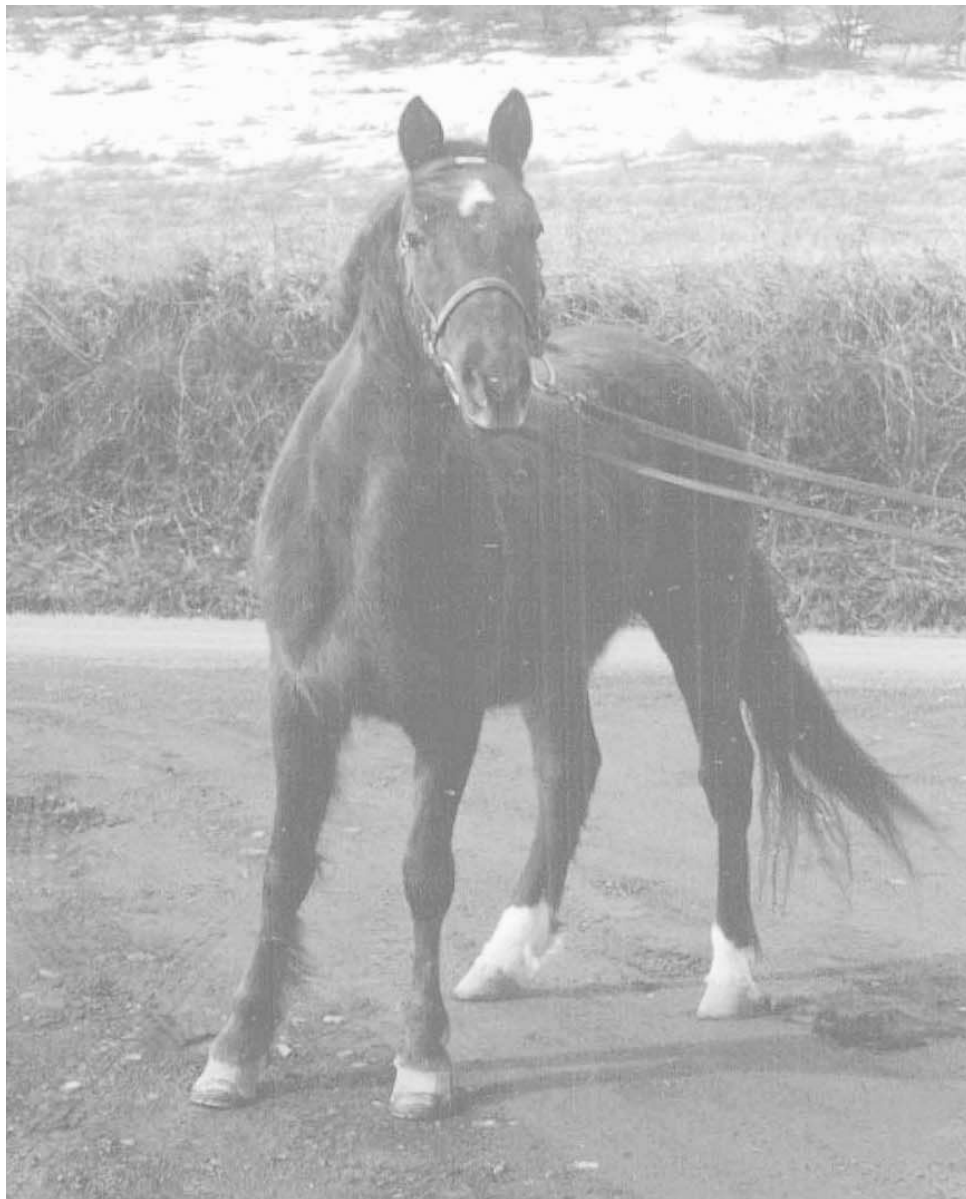
There are two pharmaceutical drugs available for treating Cushings Disease. Both carry a risk of initiating or aggravating liver disease. Before you administer either of these drugs, ask your veterinarian to do a blood test for liver disease. The drugs are Cyproheptadine (also known as Periactin) and Pergolide (also known as Permax). Apparently, the effectiveness of these drugs is variable. We tried Pergolide for three months, and saw no appreciable improvement in April's condition. We have also talked with one other owner who took her horse off Pergolide after three months for the same reason. Other horses may respond dramatically. It is the owner's responsibility to monitor results.

Finally, in the process of researching this article we spoke with Donna White and she told me of a very promising herbal remedy marketed under the name Hormonise. The plant ingredient in this product is *Vitex agnus castus*, a plant with the common name of Chaste berry. A native to the Northern Mediterranean coast and central Asia, it grows in wet areas such as creek beds and river banks. It has been used for medicinal purposes since 400 B.C., and appears in both Greek and Roman literature. It acts on the pituitary gland to increase progesterone levels.

In modern equine applications, Hormonise was originally formulated as a botanical for regulating hormone imbalances in mares, geldings or stallions. Dr. Eleanor Kellon first documented the effectiveness of this product in treating Cushings in the December 2000 issue of *Horse Journal*. A widely published author and veterinarian, Dr. Kellon has a significant presence on the internet. You can find numerous titles by her simply by typing Eleanor Kellon in your search engine. Dr. Robert Eustace of the Laminitis Trust in the United Kingdom is now conducting clinical trials on this product. (e-mail: info@laminitis.org). We found extensive listings on the internet under the search name Chaste Berry, most of it relating to regulating PMS in humans.

Another invaluable internet resource is a posting list designed to share information about this disease. The url is EquineCushings@yahoogroups.com. Several veterinarians with nutrition specialties participate in this list, and it is packed with information. "Veterinarians have observed this disease for at least a century," Dr. Belinda Thompson said. "When I was in vet school in the early '80s, it was not treated. I have had to learn a lot about this disease. A balanced diet seems to be critical in managing this disease." Dr. Thompson strongly recommends having hay analyzed for nutrient and mineral content. For some owners, who buy hay in small lots, this is virtually impossible. However, the owner who can buy an entire winter's supply from a single field is in a good position to analyze the hay after each annual harvest and adjust nutritional supplements accordingly. The cost of analysis is about \$35. From reading the postings on the list, it appeared that Dr. Kellon has done nutritional consulting for list members. Ask your veterinarian about hay analysis and nutritional recommendations, based on the analysis.

Donna White of White Haven Farm in Upton, Massachusetts, sells Hormonise, and generously spoke with us at length about how she first came to use the product. She



originally bought Hormonise to regulate her mare's heat cycles. She had a pony that had Cushings in the "dark ages", when very little was known about the disease, and almost nothing was available to treat it. The pony lived to the respectable age of twenty-three years, but Donna saw how very difficult it was to manage the pony's illness and provide a good quality of life.

Hormonise regulates hormonal disturbances in the pituitary gland. "I feel comfortable because of the research and documentation from Dr. Kellon. The good thing is that owners see the results on the outside. The horses shed out properly, excessive drinking/urination stops and the horse becomes happy and bright," said Donna.

Donna White strongly recommends that owners establish the horse's base line, Cushingoid or not, with three key tests:

- A complete blood count
- A chemical profile
- A Lyme disease titer count

If the owner establishes the normal range for each horse, Cushingoid or not, and repeats these tests annually, he or she can identify changes quickly and take corrective action. This basic testing applies to all horses. When abnormal tendencies appear, a diagnosis will be easier to achieve. If Cushings is suspected, Donna recommends a test to confirm the diagnosis, one recommended by your veterinarian.

Donna White also cautions: if the horse is receiving supplements for joint stiffness, try a chondroitin-based product, as opposed to a glucosamine-based product. Since glucose is a sugar, it is not advisable for the Cushings horse.

### The Price

The cost of Hormonise is comparable to the cost of Pergolide and Cyproheptadine. I calculated the cost for recommended dosages for April at about \$60 to \$70 per month, depending on the product. Prices will vary regionally. In my area, that is between \$720 and \$840 per year. Dr. Thompson stated that at this point, we have no way to predict which medicine will work best for an individual. "Hormonise works best for some, cyproheptadine for others, and pergolide for yet another group," she observed. "The veterinarian and owner have to work together and experiment to find what works best for one individual."

### Getting Here

I began this journey, this investigation, without prejudice as to pharmaceuticals, vitamins, botanicals, alternative therapies, et cetera. I used to think Cushings was a death knell. And I already knew it was not, because April has Cushings, and she's alive and well. So, April raised the questions I wanted to answer for readers. I learned the answers to almost all my questions. That is a large change from where the research was in 1990, when Donna White began to look for help for her beloved pony, Aquila Mighty Mac.

We had already found some solutions for April's problems --- and I found more I will try, as I researched this story. They may or may not be solutions for your horse. The solutions piece of this story is still unfolding --- for April and all equines. As I write tonight, I am very hopeful. April is doing well. Her feet are still sore, but her spirits are high. She is bright-eyed and bushy tailed. Tonight, she reared up in her stall, and made a mock dive at her lifelong stablemate --- just because she can. He pretended he was going to reply. They are like an old married couple, bickering happily. April raised her head and smiled, proudly. April feels good.

### Resources

White Haven Farm (Hormonise) (508) 529-3384

#### Acknowledgements

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