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### Living with A Beardie with Pituitary Cushing's Disease MY JOURNEY WITH PRICE Bridget Howell

*Editor's note: Cushing's syndrome is the name of the human condition more appropriately called hyperadrenocorticism in dogs. It is also sometimes referred to as hypercortisolism, because the body is trying to deal with excessive levels of the adrenal hormone cortisol. The disease can have a number of causes. Iatrogenic disease results if a dog receives high levels of steroid drugs for a prolonged period of time. The release of cortisol by the adrenal gland is under feedback control by first the hypothalamus, which monitors blood cortisol levels and if they drop releases corticotropin releasing hormone (CRH), which then goes to the pituitary gland, and causes it in turn to release the hormone adrenocorticotropin (ACTH). This travels in the blood stream to the adrenal glands located just above the kidneys, stimulating them to release cortisol. Most noniatrogenic hyperadrenocorticism is caused by benign tumors (adenomas) of the pituitary gland which causes it to release ACTH and thus cortisol in excess of the body's needs. In humans this is called Cushing's Disease. In about 20% of cases hyperadrenocorticism is the result of a benign tumor of the adrenal gland itself. In rare cases malignant tumors can metastasize and affect the pituitary or adrenal glands.)*



The signs of Cushing's Disease usually appear gradually and, because of the slow onset, these changes are often written off as part of the aging process. 80% of all Cushing's is Pituitary. My Beardie, Price, had pituitary disease, and it is his story I am telling. The following symptoms are what I observed with Price, but they are typical of all types of Cushing's disease.



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Drinking excessively and urinating excessively to the point of incontinence. The water bowl needs to be filled much more frequently, and some dogs may not be able to hold their urine all night. Urinary tract infections as well as true urine leaking may be observed. This was my experience with my Price. Normally water intake is about 1 cup of water per 10 pounds body weight per day. The increase in his water intake was progressive.

Weight gain and increased or ravenous appetite. Eating incessantly if possible or stealing food (from the garbage, counter or another dog's plate) may seem a good sign if a Beardie has previously been a finicky eater, but it is not necessarily a sign of good health. However, I found it to be important to keep track of Price's consumption of food even before the onset of Cushing's. He was never one of those Beardies who seem to be able to live on air.

Pot-bellied appearance is another sign of Cushing's disease. This becomes a symptom in 90% of the cases resulting from re-distribution of body fat – especially into the abdominal cavity and away from the subcutis (under the skin), increased weight of abdominal contents and a decrease in abdominal muscle strength as a result of elevated levels of cortisol.

Skin disease is another classic sign of Cushing's disease. The skin is thin and shows poor healing and susceptibility to infection. It wrinkles easily and blackheads and skin infections – especially along the backbone and on the belly are more common. The skin especially on the flanks and belly tends to darken (hyperpigmentation) and bruises more easily. Dogs are often itchy.

Another common symptom is hair loss on the tail (rat tail) and the main body. The head and legs are spared. If the dog is clipped, it doesn't grow back. Both conditions are caused by atrophy of the hair follicles. Calcium may be deposited within the skin (Calcinosis Cutis). This results in raised, hard and scaly areas that can become infected. Also, a perfect 'target' circle/pattern on the trunk may become visible.



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Sometimes excessive panting and shortness of breath, infertility (which Price was diagnosed with at an early stage), extreme muscle stiffness (called pseudomyotonia - a very rare symptom of Cushing's), and high blood pressure can all be symptomatic. Price had excessive panting and stiffness but not high blood pressure.

Note: Two of the internal medicine veterinarians I have worked with have told me that, "If a dog has a low thyroid problem, there more than likely will be another problem or problems in time." This information will forever stay in my memory, and if I should ever have another Beardie which has hypothyroidism, as Price did, I will be sure to watch them even more carefully than I would otherwise. Hopefully, I won't have more hypothyroid Beardies. *(Both the thyroid and adrenal glands are under the control of the hypothalamus and pituitary. In hypothyroid dogs the clearance of cortisol is reduced exacerbating Cushing's symptoms. Ed)*

I have learned a lot as a result of my experience with Price. If this article helps at least one Beardie on the verge of Cushing's Disease because it helps his owner recognize what's wrong then I am glad I wrote it.

The average life expectancy for a dog with Pituitary Cushing's is 30 months. Price lived almost twice that long, and ultimately he succumbed to cancer of the liver and spleen, not Cushing's. There is hope with proper treatment and a cooperative, knowledgeable veterinarian making a timely diagnosis. Cushing's disease can be controlled with monitoring and proper medication, although it cannot be cured.

There are two types of Cushing's Disease: Pituitary or secondary (a benign tumor on the pituitary gland at the base of the brain causes an increased release of ACTH the hormone that stimulates the adrenal glands to make or secrete cortisol) or Adrenal or primary, a usually benign tumor usually on one adrenal gland – very rarely on both. The other adrenal gland usually atrophies. Theoretically dogs can get tertiary Cushing's disease due to increased secretion of CRH from the hypothalamus that causes the pituitary to increase ACTH production and release. Atypical Cushing's disease is a



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term used to describe an increase in the production and secretion of adrenal steroid hormones other than cortisol.

Cushing's Disease cannot be treated until a positive diagnosis is attained through an ACTH stimulation test. This can be frustrating to you but necessary for the welfare of your Bearded Collie. It was over a year before my boy tested positive. We all knew what he had but could not treat it until the ACTH test came back showing positive. There is also a urine screening test for Cushing's disease (cortisol:creatinine ratio); a positive test here does not confirm Cushing's syndrome but a negative test here DOES rule it out. This is NOT to be used for any treatments until the ACTH stim test confirms Cushing's. *(The low dose dexamethasone suppression test is preferred for diagnosing Cushing's. A high dose dexamethasone suppression test may be necessary to determine whether the disease is Pituitary or Adrenal in nature. The ACTH stim test and urine cortisol:creatinine tests are used to monitor the dog's treatment. Ed.)* You feel helpless, frustrated and your heart goes out to your Bearded Collie. You need to stay focused and determined to help your best friend. Cushing's can be controlled with monitoring and proper medication.

Once you have a positive diagnosis for Cushing's Disease, there are a number of treatments that can produce good results. This will entail regular visits to your internal medicine veterinarian or your veterinarian for monitoring and more ACTH testing done to make sure the medicine is working and that the dosage remains appropriate over time.

Note: Cushing's Disease is effectively the opposite of Addison Disease. Addison's results from a deficiency of adrenal hormone's cortisol and usually aldosterone too while Cushing's results in excessive cortisol.

Pituitary treatments: (there are other brand names not listed below)

Lysodren; which is relatively inexpensive. This does not work on all dogs as was the case with Price due to it being given along with prednisone



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tablets. Price would collapse anytime he was given prednisone. (*Lysodren acts by destroying the adrenal glands. If you destroy too much the dog will effectively become Addisonian. Side effects are very common. Prednisone is a steroid hormone that acts like cortisol. Giving it to a dog with Cushing's exacerbates the disease. Too much prednisone causes a condition known as iatrogenic Cushing's which is the same as the natural disease but resolves when the dog is weaned of the prednisone. Ed.*)

Anipryl (L-Deprenyl); if the dog has mild Cushing's symptoms this may work. About one in five dogs may improve according to claims by the manufacturer. The cost is more than Lysodren. This also did not work on Price. (*The neurotransmitter dopamine reduces the release of ACTH in the pituitary. As dogs age they produce less dopamine. Anipryl inhibits the enzyme that metabolizes dopamine and so theoretically increases dopamine levels and reduces ACTH production and release. In practice it rarely proves effective for treating Cushing's. Ed.*)

Trilostane (sold as Vetoryl) inhibits an enzyme involved in the production of several steroid hormones including cortisol. Trilostane was not available in the US when Price got sick and the drug had to be imported from the UK with special permission from the FDA. While side effects can occur with trilostane they are far less common than with Lysodren. Incidence of side effects is markedly reduced if the drug is given twice daily. Usually starting at about half the manufacturer's recommended dosage and working up as needed yields the best results.

I was fortunate that this worked with Price. He stabilized and within 5 months his hair began slowly to grow back, his positive attitude started to return, his scaly & leather-like skin condition began to improve and water retention also disappeared. As with any drugs there may be reactions. Call your vet if any of the following signs of adverse reactions are observed with treatment:

- Diarrhea or vomiting
- Lethargy, weakness or listlessness



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- Anorexia (food and water intake will diminish as cortisol levels drop)
- In a small subset of dogs the synthesis of mineralocorticoids is blocked more than that of glucocorticoids. As a result these dogs may become weak, dehydrated and have low sodium and elevated potassium levels in their blood.
- The drug should be avoided or used with caution in dogs with liver and/or kidney disease, those taking some heart medications and in pregnant and breeding animals.

ACTH stimulation test: Ideally this test is run in the morning. The dog needs to fast overnight and the test is best performed between 8:00 AM and 10:00 AM. A blood sample is drawn. Then a dose of ACTH is given. A second drawing of blood is made 2 hours later. If cortisol levels rise more than expected a diagnosis of Cushing's disease is made. Generally the resting cortisol levels in the baseline sample will also be elevated in dogs with Cushing's disease.

The time (almost a year) while we were waiting for a definite diagnosis was very frustrating to both Price and me. He 'looked' terrible having the full 'appearance' of Cushing's but not the diagnosis. I would look in his eyes and see the determination which kept me going. Many that saw Price's appearance felt I was 'hanging on' and should let him go but I knew it was not the time. He would go outside with his ball in his mouth. He would bark and chase squirrels if they were in HIS backyard. "Yard patrol" was a priority for him. Price wore jackets to keep him warm in the cold months and light cotton ones in the summer to protect his skin from the sun. He was a proud boy wearing his various jackets made by a devoted admirer. It is important to protect your Bearded Collie from the elements as they do not have the double coat to protect them.

The tumor causing pituitary Cushing's can only be seen on an MRI or CT scan. That causing adrenal Cushing's can usually be shown on an ultrasound. If I knew then what I know now when we were just starting to suspect Cushing's I would have not done the x-ray and instead had an ultrasound done of the adrenal glands to eliminate that possibility of a tumor. X-rays are less likely to detect adrenal tumors.



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Maintenance Therapy for Cushing's disease:

1. Initially it can take a while to determine the best dose on trilostane for your dog. Not only will you be monitoring the appearances in his physical appearance and behavior, but your vet will be measuring the levels of cortisol either with the ACTH stim test or cortisol: creatinine urine test.
2. It is not uncommon for clinical signs to reoccur during maintenance therapy due to the dose becoming inadequate. If you notice these signs returning see your veterinarian so the dose can be adjusted accordingly.

Adrenal Cushing's:

The average life expectancy for dogs with adrenal HAC is 36 months. Treat your dog if you can because that is three years that you could be together and enjoy each other.

Kidneys and electrolyte levels should be checked regularly for both pituitary and adrenal Cushing's disease to make sure the dog is not developing signs of Addison's disease..

The onset of Cushing's symptoms is generally seen about the age of 7 years or older.

From my experience with Price, I am having full blood (CBC) and full thyroid panels done each year on my Beardies. By keeping on top of what is going on inside.it will help them (and me) in the coming years to stay on top of any potential problems. Just as humans get a complete physical yearly or every two years to make sure everything is running smoothly, so should our beloved companions.

Bridget Howell (and Price - always in my heart)

The above dissertation is the result of my personal experiences with my



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Beardie Price and is intended for informational purposes only. This should not be construed as medical advice or as a substitute for the normal care and consultation of your licensed veterinarian.