

## canine cushings disease

Cushing's Disease is a common condition in older dogs which can be mistaken for the onset of old age. A well housetrained dog can have "little accidents" and urinate in the house as well as show signs of hair loss. There are however other causes with these symptoms which are also not attributed to old age so it is important the diagnosis is correct. Classic symptoms of Cushing's Disease are frequent urination, hair loss and weight gain, which are similar to those of Canine Diabetes with the exception of weight loss rather than gain. The treatments for both diseases however are very different.

[Canine Diabetes](#) is beyond the scope of this article so for more information on [Dog Diabetes Symptoms](#) visit [www.DogDiabetesSite.com](http://www.DogDiabetesSite.com). In order to understand Cushing's disease is necessary to have a basic knowledge of what should happen in a healthy dog. The pituitary gland, which is located at the base of the brain, produces ACTH (adrenocorticotrophic hormone), as directed by the hypothalamus (another part of the brain). This hormone is released into the bloodstream and stimulates the body's two adrenal glands, located near the kidneys, to secrete glucocorticoid (cortisone-like or cortisol) hormones into the bloodstream. Cortisol helps the body respond to stress and impacts a wide variety of bodily functions. These include blood sugar levels, kidney function, fat metabolism, skeletal muscles, nervous system, cardiovascular system, and immune response. ACTH/cortisol secretion is increased due to stress, including infection, pain, surgery, trauma and cold temperatures. When the blood cortisol levels are high enough, the pituitary stops secreting ACTH. When the blood cortisol levels dip low enough, the pituitary secretes more ACTH. The adrenals respond by secreting glucocorticoid hormones in response to the pituitary, just as the pituitary responds by secreting ACTH in response to the adrenals. The net effect is that a mildly fluctuating balance is achieved. This is an oversimplified picture of cortisol homeostasis in the healthy dog. In Cushing's Disease: The response loop fails to function correctly for one of three reasons: a pituitary tumor an adrenal tumor or veterinary interference. The result is a chronic excess of blood cortisol. In effect, the dog is being poisoned with too much cortisol and cannot rely on its own regulation to correct the blood cortisol level. Pituitary Dependant Hyperadrenocorticism: The most common cause of Cushing's disease is a microscopic benign pituitary tumor which over secretes ACTH and ignores the adrenals' response. The dog's pituitary continues secreting ACTH causing the adrenals to produce cortisol, yet the pituitary does not respond to the elevated blood cortisol levels by stopping its release of ACTH. Most cases of Cushing's disease are pituitary dependent and dogs with pituitary dependent hyperadrenocorticism tend to have two very large adrenal glands; Both are constantly working to keep up production of cortisol. These pituitary tumors are usually quite small (3mm or less) but occasionally they can be larger and their size presents challenges of their own. Larger pituitary tumors over 10mm centimeter in diameter can place pressure on brain tissue and nerves, causing blindness, circling, seizures, or other neurological problems not directly related to hyperadrenocorticism. Some of these symptoms can resemble side-effects of medications used to treat Cushing's disease, further complicating diagnosis and treatment. Adrenal-based Hyperadrenocorticism: An adrenal tumor is responsible for secreting too much cortisol. These can be benign (adenomas) or malignant (adenocarcinomas) and are inclined to spread to the lungs and liver. The tumor keeps secreting too much cortisol irrespective of what the brain is telling it and about 15% of Cushing's cases are adrenal-based. In these dogs, one adrenal gland tends to be extremely enlarged (due to the tumor and the overproduction of cortisol that goes with it), and the other tends to be extremely small (to try to compensate for the overactive larger one). Iatrogenic Hyperadrenocorticism: This is a cause which we can create ourselves if we give a dog too much external glucocorticoid, especially for chronic conditions like allergies. In doing so we do what the adrenal tumor would do by flooding the dog's body with an excess of corticosteroid. Although both the adrenals and pituitary will attempt to respond to our interference by cutting ACTH and cortisol secretion, if we continue to bombard the dog's body with too much glucocorticoid, symptoms of Cushing's disease will result. The reason dogs are given irregular doses of steroids like prednisone is to avoid this consequence. Dogs with this form of Cushing's tend to have two very small, atrophied adrenal glands. Nonetheless, if iatrogenic (veterinary-induced) hyperadrenocorticism develops, it is fully reversible. The external source of steroid is slowly withdrawn to allow the adrenals to "wake up" and resume functioning. Causes: Given that tumor incidence increases with age and those tumors are the cause of Cushing's disease, it is generally a problem seen most frequently in dogs aged 8 to 10 years and can affect males or females alike. Spayed or neutered dogs can sometimes have a slightly greater incidence of Cushing's Disease. Although all breeds are at risk, Pituitary-dependent Cushing's is more common in small dogs, with 75% of cases being in dogs weighing less than 44 pounds (20 Kg). Adrenal-based Cushing's cases on the other hand occur 45-50% of the time in dogs weighing more than 44 pounds (20 Kg). Symptoms: Symptoms of Cushing's disease can be vague and varied and tend to appear gradually and progressively so it is all too easy to mistake Cushing's disease for normal aging. Additionally, many of the clinical symptoms are not unique to Cushing's and could reflect a number of other health concerns. The most common symptoms include: Increased urination (polyuria) Increased water consumption (polydipsia) Urinary accidents in previously housetrained dogs Increased appetite (polyphagia) Sagging, bloated or pot-bellied appearance Appearance of weight gain due to fat redistribution Exercise intolerance or general lethargy It is generally the increased water intake and urination or the coat changes which are most noticeable although other indirect symptoms to consider are the disappearance of previous inflammatory conditions. Dogs with chronic allergies or arthritis may appear considerably better when they develop Cushing's Disease, due to the heavy doses of cortisone they are giving themselves. Diagnosis: A urinalysis may reflect high levels of protein and low specific gravity (dilute urine). X-rays or ultrasound may show an enlarged liver or either enlarged or atrophied adrenals with half of adrenal tumors appearing mineralized. A CT scan could also be used to search for a pituitary tumor but specific lab tests are more common to pinpoint a diagnosis. These tests include a urine cortisol and creatinine ratio test, an ACTH stimulation test, and low and high dose dexamethasone suppression tests. NOTE: There is no single test to diagnose Cushing's, and Cushing's Disease is often difficult to accurately

diagnose. Treatment: Treatment depends on the type of Cushing's disease, as well as on the overall health of the canine patient. Many dogs with Cushing's are elderly and may have other health problems; treatment can be complicated with no "one size fits all" remedy. The comfort of the patient should be the ultimate goal and a dog with severe arthritis may be more humane not to elect for treatment. Surgery may be indicated for adrenal tumors and chemotherapy in the form of Lysodren or Ketoconazole may be used to treat pituitary-dependent or adrenal-based Cushing's Disease. Anipryl may also be tried to combat pituitary-dependent Cushing's. Treatment is best viewed as a means to improve quality of life, rather than increase lifespan. Surgery: If Cushing's disease is caused by an adrenal tumor, the logical approach is to surgically remove the tumor AND the affected adrenal gland. These tumors tend not to recur on the remaining adrenal gland and the prognosis is very good for dogs with benign adrenal tumors however most owners opt for non-surgical treatment. Pituitary tumors are not removed surgically in veterinary medicine. These tumors tend to be very small and slow-growing and cause little or no damage on their own, aside from over stimulating the adrenal glands. With these canine patients, the symptoms themselves are treated and not the root cause. Prognosis: Left untreated, Cushing's disease will progress. As excess cortisol is immunosuppressive, it causes dogs to become prone to various infections. They are also predisposed to developing other complications such as hypothyroidism, pancreatitis, diabetes, seizures, hypertension, congestive heart failure, blood clots and liver and kidney failure. The short-term prognosis is very good. Treated, one would expect symptoms of Cushing's to fully resolve over the course of 4-6 months. Excess drinking and urinating abate quickly. It may take several months for hair and coat improvement to be observed. Dogs generally are more comfortable after the disease is under control and may live happily for years. Alternatively, some dogs become very uncomfortable if arthritis, allergies, or other inflammatory conditions are unmasked once the excess cortisol is removed, paradoxically reducing the animal's quality of life. Another consideration relates to pituitary tumors themselves. These tumors continue to be somewhat responsive to blood cortisol levels, so it is possible that controlling cortisol release at the adrenal level may hasten the growth of a pituitary tumor, as the pituitary tumor is no longer kept in partial check by excess cortisol levels. Neurologic signs from a pituitary macroadenoma may then present themselves. The goal of treatment is to improve quality of life and perhaps lengthen life, but except in situations where an adrenal tumor can be completely removed or where a dog can be weaned off external sources of cortisone, Cushing's disease is not something from which a dog recovers. Cushing's disease is managed, not cured. &nbsp;

## About the Author

Noel Dundas is the author of several publications, including The [Canine Diabetes Management Guide](#) and the [Canine First-Aid Handbook](#). Computing since the late 60's, he is a self professed Geek and has become someone to turn to for advice on canine diabetes. You can contact him about [Canine Diabetes](#) at [www.DogDiabetesSite.com/contact.html](http://www.DogDiabetesSite.com/contact.html) for reliable and free advice

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