



## Cushing's Disease

Pituitary dependent hypercortisolism, more commonly known as Cushing's disease, is caused by a pituitary tumor (non-cancerous) that triggers excessive levels of the stress hormone cortisol. When functioning normally, the pituitary, a pea-sized gland at the base of the brain, produces adrenocorticotrophic hormone, or ACTH, which stimulates the adrenal glands near the kidneys to produce cortisol. A small percentage of dogs with Cushing's disease have a tumor of one of the adrenal glands which may or may not be cancerous. This form of Cushing's is called adrenal dependent Cushing's and results from a direct increase in cortisol production by the adrenal gland tumor. Every year, roughly 100,000 dogs are diagnosed with Cushing's disease in the United States. Most dogs are six years of age or older when diagnosed, but it can occur in younger dogs. The disease is rare in cats.

### **What are some common symptoms?**

The over production of cortisol causes symptoms such as hair loss, pot-bellied appearance, increased appetite, and increased drinking and urination called polydipsia and polyuria (PU/PD). Hair loss caused by Cushing's disease occurs primarily on the body, sparing the head and legs. The skin is not usually itchy as it is with other skin diseases. If you pick up a fold of skin on a dog with Cushing's disease, you may notice that the skin is thinner than normal. The pet may have fragile blood vessels and may bruise easily. Because cortisol affects the function of many organs in the body, the signs of Cushing's disease may be varied. Left untreated, a pituitary tumor could grow large enough to press on the brain causing neurological symptoms such as difficulty walking or seeing, or other conditions including diabetes or seizures. Dogs that are given prednisone or similar drugs can develop signs that look like Cushing's disease (called iatrogenic Cushing's). If your pet is showing any of these symptoms, talk with your local veterinarian.

## What test might my veterinarian use to diagnose Cushing's disease?

There is no single test to diagnose Cushing's disease. The history, physical exam, and results of initial blood and urine tests often provide a strong suspicion for the presence of Cushing's disease. An increase in white blood cell count or platelet count, increase in the liver enzyme alkaline phosphatase (ALP also called SAP, or serum alkaline phosphatase), increased blood sugar (although not as high as the blood sugar levels of diabetic patients), increased cholesterol and dilute urine. Some of the specific tests for Cushing's disease include urine cortisol/creatinine ratio, low dose dexamethasone suppression test, high dose dexamethasone suppression test, and an ACTH stimulation test. See [What Do Those Lab Tests Mean?](#) for additional information about laboratory tests.



Because large amounts of cortisol in the body suppresses the immune system, dogs with Cushing's disease may be more likely to get bacterial infections, particularly bladder infections. A culture of the urine may be necessary to diagnose the infection because they may not show typical signs such as straining to urinate.

Patients with Cushing's disease may have an enlarged liver or enlarged adrenal glands (both if pituitary dependent, but just one if the dog has an adrenal tumor). Your veterinarian may take x-rays or use ultrasounds to check the liver or adrenal glands. The adrenal glands cannot always be seen during an ultrasound exam in pets with Cushing's. In some pets with an adrenal tumor, the tumor can be seen growing into large blood vessels close to the adrenal gland or spread from the tumor may be seen in the liver.

## What are the treatment options for Cushing's disease?

**Oral Medication:** Lifelong oral medication is often prescribed for pituitary dependent Cushing's disease to help manage the symptoms. The most common drugs used to treat Cushing's disease are **Trilostane** and **o,p'-DDD** (also called Mitotane or Lysodren). The initial treatment of o,p'-DDD, called induction, is initially given daily or twice daily for about a week (sometimes more, sometimes less), but it can have serious side effects so pets being treated for Cushing's disease must be closely watched. After induction o,p'-DDD is given less often, usually once or twice weekly for the life of the pet. Some pets will have a recurrence of signs of Cushing's disease later in life, even though they are receiving o,p'-DDD. Trilostane tends to have fewer side effects than o,p'-DDD and can be easier to manage, however it is more expensive. For pets with adrenal dependent Cushing's, o,p'-DDD and Trilostane are not as effective in reducing symptoms as it is in pets with pituitary dependent Cushing's disease. Discuss with your veterinarian which treatment is best for your pet.

**Radiation:** Radiation may be used to shrink the size of a pituitary tumor. This treatment is most effective on small tumors to help reduce the symptoms of pituitary dependent Cushing's disease.

**Surgery:** Treatment of adrenal dependent Cushing's disease is by surgical removal of the affected adrenal gland. Adrenal gland tumors, if cancerous, can spread to other parts of the body in which case all the cancer cannot be removed by surgery. Medical treatment may be given before surgery to reduce hormone levels before surgery. Trilostane may be effective in controlling the signs of Cushing's in some dogs with adrenal tumors, but is not a definitive treatment.

Transsphenoidal surgery is used to remove a pituitary tumor. The surgeon uses an exoscope, a long tube with a light at the end for magnification and illumination, to reach the pituitary through the soft palate in the mouth to access the base of the skull where the pituitary is located. Surgical removal of the tumor generally eliminates the need for lifelong medication.

## **What is the prognosis?**

The prognosis for pituitary dependent Cushing's disease with treatment is usually good. Some signs will disappear quickly and others gradually. Appetite and water consumption usually return to normal in a few weeks where as full return of the fur may take several months. With pituitary surgery, roughly 85 to 95 percent of dogs who have the tumor removed have hormonal remission, meaning it cures the hormonal imbalance and the symptoms as well as alleviating neurological symptoms. For dogs with adrenal tumors, surgery can be potentially curative. Treatment of one type of Cushing's disease, either pituitary or adrenal, does not prevent the development of the other.

*This information is not meant to be a substitute for veterinary care. Always follow the instructions provided by your veterinarian. Washington State University assumes no liability for injury to you or your pet incurred by following these descriptions or procedures.*