

Cushing's Disease

Also Known As: Hyperadrenocorticism, Cushing's syndrome, PDH (pituitary dependent hyperadrenocorticism)

Transmission or Cause: The cause of Cushing's disease is unknown. The majority of dogs with the illness have a pituitary gland problem, while the remaining dogs have adrenal gland tumors.

Affected Animals: Although dogs of almost every age have been reported to have Cushing's disease, it is most common in middle-aged and older dogs. Most dogs diagnosed with Cushing's disease are older than nine years. Slightly more female dogs are affected than male dogs. Several breeds are more commonly diagnosed with Cushing's than others including poodles, terriers, German shepherds, dachshunds, beagles, and boxers. Many of these same breeds are also reported to have adrenal gland tumors at a greater frequency.

Overview: Cushing's disease results from excessive production of cortisol, a hormone normally produced by the adrenal glands. This excessive cortisol production is due to abnormalities in the pituitary gland that cause excessive hormone secretion by the adrenal glands.

A variety of symptoms can result from excess cortisol, the most common of which include increased thirst and urination, increased appetite, panting, and skin changes such as hair loss and thinning of the skin. Efforts to distinguish which form of the disease is present are important, as this can influence treatment recommendations. Blood tests and imaging procedures, including abdominal ultrasound, may be needed to make this distinction. Pituitary-dependent Cushing's disease (PDH) is usually treated with medications. Adrenal gland tumors are best addressed surgically, although they can also be treated medically in situations in which surgery is not advised.

Symptoms: Increased thirst, increased urination, increased appetite, panting, hair loss, darkening of the skin, thinning of the skin, abdominal enlargement, skin infections, flaky or greasy skin, weakness, tiredness, muscle spasms, obesity, facial paralysis, reproductive changes, bruising.

Diagnosis: A definitive diagnosis of Cushing's disease can be difficult to obtain. Diagnosis is initially suspected when dogs present with classic symptoms of the disease and the results of routine laboratory tests. As with many illnesses, a complete blood count, biochemistry profile, and urinalysis are very important tools in the initial evaluation of a dog suspected of having Cushing's disease. Usually there will be changes on these tests that may indicate the possibility of Cushing's disease. Routine

imaging procedures, such as abdominal x-rays, may show changes including generalized liver enlargement, and less commonly, adrenal gland enlargement or mineralization. Abdominal ultrasound is also used frequently in the evaluation of Cushing's suspects to evaluate the liver size and texture, the size and shape of the adrenal glands, and to look for evidence of other abnormalities that may be contributing to the dog's symptoms.

A more definitive diagnosis depends on the results of tests that look more specifically at adrenal gland function. The urine cortisol-to-creatinine ratio is used in some cases, but it is not a great diagnostic tool because abnormal results are common with a variety of illnesses. The two most commonly used screening tests are the ACTH stimulation test, and the low-dose dexamethasone suppression test, although the results of these test can be hard to interpret.

Once a tentative diagnosis of Cushing's disease is established, an attempt to distinguish which form of the disease is present should be made. The tests most commonly used to distinguish the pituitary-dependent form from an adrenal tumor are the high-dose dexamethasone suppression test, internal ACTH levels, and abdominal ultrasound. CAT scans can also be used to evaluate adrenal gland structure, and MRI scans can be used to look for abnormalities in the pituitary gland.

Prognosis: The outlook for surgical treatment of adrenal gland tumors is fairly good, provided that the animal survives the surgery and the period immediately after. As a rule, dogs with benign adrenal gland tumors live longer than dogs with malignant tumors. The spread of a malignant tumors makes for a worse prognosis. Such animals can be treated successfully with medication to help keep symptoms under control after surgery. Dogs that survive surgery are reported to have an average survival time of up to three years.

Dogs treated successfully for PDH live approximately two years. Some dogs may not survive this long while others may live for 10 years or more. The estimated years a dog will live with Cushing's depends on their age at the time of diagnosis, the presence of additional disorders, and the development of complications related to treatment. Relapses are common in patients treated medically with many dogs requiring adjustments to the medications due to recurrence of signs in the first year. Almost half of all dogs with Cushing's disease that do not survive do so because of problems related either to the disease itself or its treatment. However, despite a guarded long-term prognosis, the majority of dogs can lead lives of excellent quality with careful monitoring and attention to detail.

Treatment: Treatment of Cushing's disease varies depending on which form of the disease is present. There are both surgical and medical treatment options for Cushing's disease. Surgery is the preferred way to manage dogs with adrenal tumors, while medical treatment is used for dogs with PDH. It is important to note that PDH cannot be cured. The goal with treatment is to eliminate or minimize symptoms due to excessive cortisol production, and to prevent potentially life-threatening complications from the disease.

The drug most commonly used to treat Cushing's disease when surgery is not an option is Trilostane, which interferes with hormone synthesis by enzyme competition within the adrenal gland. This drug is given one to two times daily and the dose is adjusted based on periodic rechecks of the ACTH stimulation test. Most animals will show improvement within 7 days.

Another drug used less frequently is Lysodren or mitotane. Lysodren is used at first on a daily basis. Lysodren is a chemotherapy drug that works by actually causing death of the cortisol-producing cells in the adrenal gland. Very careful monitoring is necessary once Lysodren has been prescribed. After the initial induction phase, lower doses of the drug are administered during the maintenance phase, usually two to three times a week. Often, the veterinarian will need to make adjustments in the medication dose according to the recurrence of symptoms during maintenance treatment.

In dogs with PDH that have large pituitary gland tumors, particularly those dogs with neurological signs due to the physical presence of a large pituitary mass, the primary treatment is radiation therapy to control the growth of the tumor.

Dogs with adrenal tumors can be treated surgically or medically. The main treatment for adrenal tumors is surgical removal. Since this surgery is very difficult with many potential complications during and after the procedure, a surgeon experienced in removing adrenal gland tumors should perform it. After surgery, animals often need to be supplemented with both glucocorticoids and mineralocorticoids, the two primary types of steroids normally produced by the adrenal gland. Sometimes supplementation can be tapered as the remaining adrenal gland begins to function again, but some dogs will require supplementation for life.

Dogs who are good candidates for medical treatment instead of surgical treatment include dogs with large and likely inoperable tumors, dogs that are very sick, old, or debilitated, and dogs with suspected spread of a malignant adrenal gland tumor.

Prevention: The exact cause of Cushing's disease is not known, and there is no way of preventing the disease from developing. Since signs of Cushing's disease can occur in dogs that are treated for long periods of time with high doses of glucocorticoids such as prednisone, this treatment should be avoided whenever possible. In these dogs with "iatrogenic Cushing's disease", the signs should resolve as the glucocorticoid dose is tapered.