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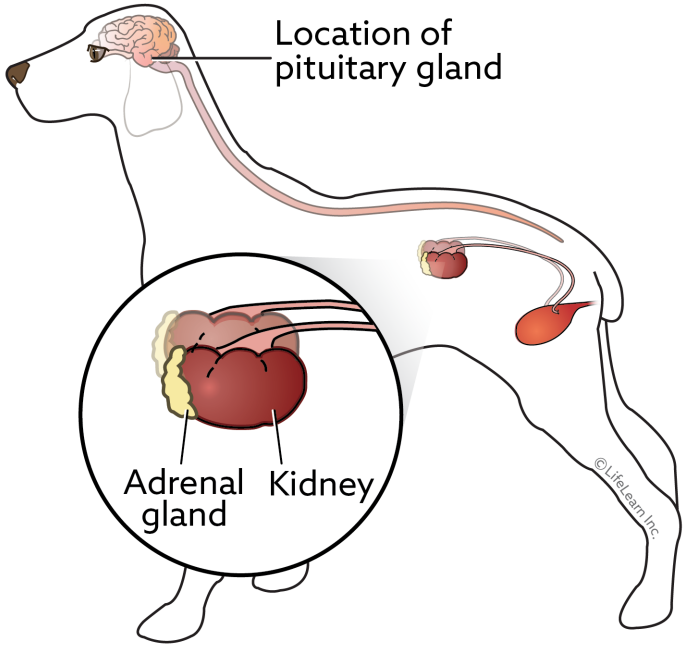
Cushing's Disease in Dogs

What is Cushing's disease?

Cushing's disease (also known as Cushing's syndrome) is a condition in which the adrenal glands overproduce certain hormones. The medical term for this disease is hyperadrenocorticism. Literally translated, "hyper" means over-active, "adreno" means adrenal gland, and "corticism" refers to the outer part (cortex) of the adrenal gland.



The adrenal glands are located near the kidneys and produce several vital substances that regulate a variety of body functions and are necessary to sustain life. The most widely known of these substances is cortisol, commonly known as cortisone. Decreased or excessive production of these substances, especially cortisol, may be life-threatening.

What causes this disease?

There are three types of Cushing's disease, each with a different cause. Identifying the cause is important because each type is treated differently, and each has a different prognosis (expected outcome).

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Pituitary gland tumor. The most common cause of Cushing's disease (85%-90% of all cases) is a tumor of the pituitary gland, which is located at the base of the brain. The tumor may be either benign (harmless) or malignant (cancerous). The tumor causes the pituitary gland to overproduce a hormone (ACTH) that stimulates the adrenal glands to produce cortisol.

Pituitary gland tumors may be microscopic or large. Depending on the size of the tumor, clinical signs other than those of Cushing's disease may be present, since a large tumor might press on or interfere with nearby structures. Generally, if the activity of the adrenal gland can be controlled, many dogs with this form of Cushing's disease can live normal lives for many years, if they take their medication and stay under close medical supervision. If the pituitary tumor grows, it will affect the brain, often resulting in neurological signs and giving the pet a less favorable prognosis. This happens in approximately 15% of these patients.

Adrenal gland tumor. Cushing's disease may be the result of a benign or malignant tumor (adenoma or carcinoma, respectively) of the adrenal gland. If the tumor is benign, surgical removal will cure the disease. If the tumor is malignant, surgery may help for some time, but the prognosis is much less favorable.

Excessive cortisol from prolonged use of steroids. The third type of the disease is called iatrogenic Cushing's disease. It is caused when there is excessive administration of an oral or injectable steroid. Although steroids are usually given for a legitimate medical reason, in this case, their excess has become harmful to the patient.

What are the clinical signs of Cushing's disease?

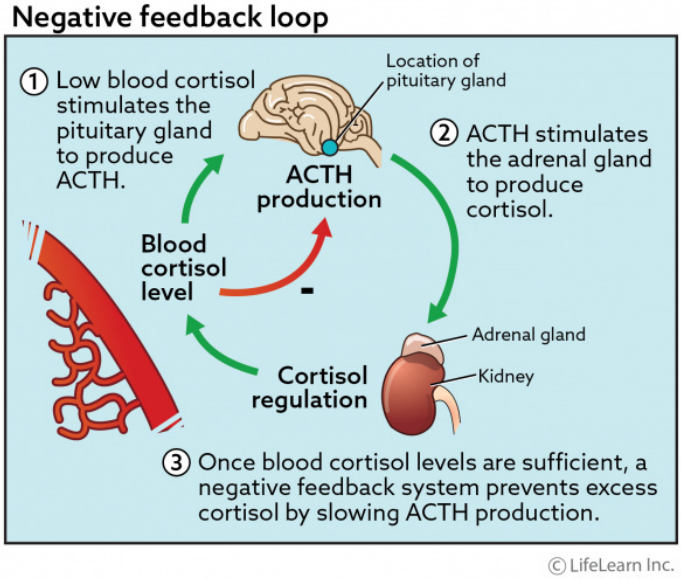
Regardless of the type, the clinical signs of Cushing's disease are essentially the same. The most common clinical signs are increased appetite, increased water consumption, and increased urination. The increased appetite is a direct result of elevated cortisol levels, which stimulate appetite. Lethargy (drowsiness or lack of activity) and a poor hair coat are also common in pets with hyperadrenocorticism.

Many of these dogs develop a bloated or "pot-bellied" appearance to their abdomen because of an increase of fat within the abdominal organs and a stretching of the abdominal wall as the organs get heavier. The pot-bellied appearance also develops because the muscles of the abdominal wall become weaker and eventually atrophy (shrink in size). Other common clinical signs include panting, thin skin, chronic skin infections (pyoderma), dark-colored spots (hyperpigmentation), skin mineralization (calcinosis cutis), poor skin healing, and persistent bladder infections.

How is Cushing's disease diagnosed?

A thorough examination and history, as well as baseline blood (complete blood count (CBC) and biochemistry profile) and urine testing will give your veterinarian an idea that Cushing's may be present. Certain laboratory abnormalities are commonly seen with Cushing's, such as a stress leukogram on CBC (a specific pattern in the white blood cell numbers), an elevation in a liver enzyme called ALP, a lower urine concentration, and protein in the urine.

Imaging such as X-rays and abdominal ultrasound can also be helpful. An enlarged liver may be noted on X-ray. An abdominal ultrasound examination lets your veterinarian see the adrenal glands and determine their size and the presence of a tumor.



Several blood tests are used to diagnose and confirm Cushing's disease. The two most common tests to detect Cushing's disease are the ACTH stimulation test and the low-dose dexamethasone suppression (LDDS) test.

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Other tests that may be used to help determine the type of the disease are endogenous ACTH levels (the level of the hormone ACTH in the body), a high-dose dexamethasone suppression (HDDS) test, or a urine cortisol:creatinine ratio. Although some of these tests can be expensive, they are necessary to determine the best treatment and prognosis for your pet. See handout "Cushing's Disease - Testing" for further information about testing for Cushing's disease.

What are the treatment options?

Treatment depends on which type of disease is present.

Pituitary tumor. Treatment of the pituitary-induced form of Cushing's disease is the most complicated. Trilostane (brand name Vetoryl®) is the drug most used. It works by blocking an enzyme involved in hormone synthesis. Mitotane (brand name Lysodren®) is another option. It destroys adrenal tissue and can be associated with more side effects. Selegiline hydrochloride (brand name Anipryl®), and ketoconazole (brand name Nizoral®) are other medications, although they are not considered as effective as trilostane or mitotane and are not typically recommended. Surgery to remove the pituitary tumor, or radiation therapy, may be an option at certain referral centers.

Adrenal tumor. Treatment of an adrenal tumor requires major abdominal surgery. If the surgery is successful (the entire tumor is removed) and the tumor is not malignant, there is a good chance that the dog will regain normal health. If surgery is not an option, some of these patients can be managed with medication, as discussed above, though they don't tend to respond as well. Mitotane may be more effective with adrenal tumors as it can be destructive to the tumor itself, though higher doses are required. Radiation may be an option at certain referral centers.

Iatrogenic Cushing's disease. Treatment of this form requires discontinuation of the steroid being given. The steroid must be discontinued in a controlled, gradual way so that other complications do not occur. Unfortunately, it usually results in a recurrence of the disease that was being treated by the steroid.

What do I need to know if my dog's disease is being managed with medication?

Your veterinarian will outline a treatment plan for your pet's condition. Be sure to follow their guidelines closely because these treatments depend on consistent and regular administration of the medication. Lifelong treatment may be necessary.

Most dogs can be successfully treated with few medication side effects. However, your pet must be carefully monitored using blood tests and clinical signs. Follow-up blood tests are very important to be certain your pet is receiving the proper dosage and not too little or too much of the drug, both of which can cause complications.

What is the prognosis?

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