What is Cushing’s Disease?

Hyperadrenocorticism, or Cushing’s disease, also known as Cushing’s syndrome, is a common endocrine disease of middle-aged dogs. Miniature Poodles, Dachshunds, Boxers, Boston Terriers, and Beagles are particularly vulnerable. The onset of the disease is slow, so its symptoms are often mistaken for signs of age. Cushing’s disease can cause reduced activity, change in appetite, and hair loss. Other symptoms include increased thirst and urination, muscle weakness, and obesity. Dogs with Cushing’s often have a pot belly.

Most instances of Cushing’s disease occur naturally and are generally a result of a benign tumor in either the pituitary gland or the adrenal glands.

The disease is caused by the chronic excess of a glucocorticoid hormone, cortisol. This hormone is essential for functions such as maintaining blood glucose levels, metabolizing fats, and keeping major organs functioning properly. “Cortisol is one of the body’s natural steroids,” says Ann Stohlman, VMD, a veterinarian in FDA’s Center for Veterinary Medicine. She notes that a normal amount of cortisol is necessary to good health. “It helps the body adapt in times of stress.” Cortisol also helps regulate proper body weight, tissue structure, and skin condition. However, an excess of cortisol weakens the immune system, leaving the body vulnerable to other diseases and infections.

Types of Cushing’s Disease

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adrenal glands. There are two primary types of the disease.

**Pituitary-dependent hyperadrenocorticism (PDH)**

This is the most common form of the disease (80% to 85% of spontaneous cases), and it often occurs as the result of a benign tumor of the pituitary gland. This tumor causes the pituitary gland to produce large amounts of ACTH, which stimulates the adrenal glands to produce excessive amounts of cortisol which then travels through the bloodstream.

A third cause of Cushing’s in dogs results from the long-term use of high doses of corticosteroid drugs such as prednisone or dexamethasone. These steroid drugs are used to decrease inflammation or treat an immune disorder. The type of Cushing’s disease the dog has will determine what kind of treatment a veterinarian prescribes.

**Adrenal-dependent hyperadrenocorticism (ADH)**

This form of the disease is less common (15% to 20% of spontaneous cases), and occurs when a tumor develops in one, or sometimes both, adrenal glands. This tumor produces excessive levels of cortisol.

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**Treatment**

Mark E. Peterson, DVM, Dip. ACVIM, who has over thirty years experience in endocrinology and heads the New York City-based Animal Endocrine Clinic, states, “Most dogs with hyperadrenocorticism can be treated with drugs such as mitotane (Lysodren™) or triostane (Vetoryl™).” He further notes that the use of these drugs can be tricky, and it is best when they are prescribed under the supervision of a veterinarian with much experience in their use.

In December 2008, the Food and Drug Administration approved Vetoryl™, the first new drug in more than ten years to treat Cushing’s. Vetoryl™ was also the first drug approved to treat both pituitary- and adrenal-dependent Cushing’s in dogs. This drug should not be given to dogs that are pregnant, have kidney or liver disease, or take certain medications used to treat heart disease. Selegiline (Anipryl™) is the other FDA approved drug to treat Cushing’s, but it is only recommended to treat uncomplicated, pituitary-dependent Cushing’s.

Another option is to use “off-label” or “extra-label” drugs, which mean drugs which are approved for human usage, but can be legally prescribed to animals for uses not listed on the label. One of the most common of these drugs is the human chemotherapy drug Lysodren™. This drug is used to destroy layers of the adrenal gland that produce cortisol. However, dogs may react unpredictably to human medication. Lysodren™ requires careful monitoring and is best prescribed by a vet experienced in its usage.

Once a dog is on medication for Cushing’s, it will need to be treated for life. The disease is not usually cured. It is managed. “Treating Cushing’s is a balancing act,” Dr. Stohlman says. “But dogs with the disease can live a good life if they are monitored closely by a veterinarian and the owner is diligent about bringing the dog in for blood work and giving the medication as directed.”

Sometimes, if the tumor is operable, it is possible that surgery can be done to remove the gland and cure the disease. There are times when Dr. Peterson feels surgery is a better choice. He states, “If the dog has a tumor of the adrenal gland, surgical removal is generally the best option.” External radiation therapy can also help dogs with pituitary tumors, especially large ones.

### Diagnosis

Diagnosing Cushing’s syndrome can be difficult. Laboratory test results may be inconclusive, and dogs suffering from other diseases can show false-positive test results for Cushing’s syndrome.

Dr. Peterson recommends that veterinarians test for Cushing’s only if the dog is presenting several of the symptoms for the disease. He notes, “Typically the disease is insidious and slowly-progressive, so most dogs have had clinical signs, such as abdominal enlargement, panting, muscle weakness, thin skin, lethargy, polyphagia, polyuria and polydipsia (PU/PD) for months to even years before the owners recognize a problem and seek veterinary help.”

There are three screening tests designed to diagnose Cushing’s syndrome:

- ACTH stimulation test
- Low-dose dexamethasone suppression test (LDDST)
- Urinary cortisol:creatinine ratio (UCCR)

Dr. Peterson does not recommend testing for Cushing’s when a dog is sick with clinical signs that would not be related to the disease (e.g., vomiting, anorexia, weight loss). Since many diseases will produce false-positive results with the endocrine tests, he says, “Remember, hyperadrenocorticism is only slowly progressive, so hyperadrenocorticism is never an emergency diagnosis.” It is best to avoid putting a dog on a lifelong regime of medication unless the veterinarian is certain that this is necessary.

### Miniature Poodles, Dachshunds, Boxers, Boston Terriers, and Beagles are particularly vulnerable to Cushing’s disease.

Once the veterinarian has diagnosed Cushing’s disease, the next step is to determine whether the disease stems from a tumor of the pituitary or of the adrenal gland. This can be done by further endocrine testing or by imaging techniques, such as abdominal ultrasound.

As pet sitters who may only see our furry clients a few times a year, we may be the fresh eyes to notice changes that are not obvious to owners who see them daily. Sometimes an overweight dog simply needs a better diet, but if there are other symptoms as well as weight gain, there could be an underlying medical problem.