

## **Cushing's Disease**

### **What is Cushing's disease?**

Cushing's disease (also called hyperadrenocorticism) is a condition caused by the production of excess amounts of the hormone cortisol. Cortisol is made by the adrenal glands of the body and then released into the bloodstream. It has many important functions such as combating stress, ameliorating inflammation, and helping to make available energy stores to the body by encouraging the break-down of muscle and fat. It is a critical hormone for many normal body functions.

### **What causes Cushing's disease?**

The answer to this question is a bit complex in that there are several possible causes and multiple tests are often needed to pinpoint the exact cause in any given individual. In most dogs (about 80 to 85 percent of cases), the disease occurs due to a benign secretory tumor of the pituitary gland. In other dogs (about 15 percent of cases), the disease occurs due to a tumor in one of the adrenal glands (in some cases, these tumors are benign and in some cases they are not).

### **What are common clinical signs?**

While normal amounts of cortisol are protective to the body, excessive amounts can become quite detrimental as the disease progresses. Each patient is a bit different in the symptoms that they show, but some common clinical signs include increased appetite, increased thirst, increased urination, panting, the breakdown of body muscle (loss of abdominal muscle may result in a "pot belly" appearance in some dogs), enlargement of the liver, hair loss, and increased incidence of infection (especially in the skin and urinary tract). Other clinical signs (hypertension, proteinuria) may also occur but are less common. Lastly, in some dogs with the pituitary form of the disease, signs of brain disease may occur (unexplained changes in behavior, abnormal gait), as the tumor enlarges enough to compress nearby structures.

### **How is Cushing's disease diagnosed?**

The diagnosis of Cushing's disease is complex. Initial screening tests (CBC, biochemistry profile, urinalysis) along with clinical signs offer the first clues that this disease may be present. As other diseases can have similar test results, specialized testing is then necessary to confirm Cushing's disease. The two tests used most commonly to diagnose this disease are the ACTH stimulation test and the low dose dexamethasone suppression test (LDDST). Once the diagnosis is made, testing then continues to determine if the disease is due to a pituitary tumor or an adrenal tumor. Common tests that are used to help answer this question include the high dose dexamethasone suppression test (HDDST), ACTH levels, and abdominal ultrasound. Lastly, in animals with the pituitary form of the disease, special imaging studies of the brain (MRI study) are helpful in determining the size and extent of the tumor. In addition to these tests, ancillary diagnostics to look for complications associated with Cushing's disease may also be indicated (such as urine culture, blood pressure measurements, abdominal ultrasound, and other).

### **How is Cushing's disease treated?**

The answer to this question depends in part on what type of disease your pet has. If your pet has an adrenal tumor, surgical removal of the tumor may be possible (in some cases) or medical therapy utilized. If your pet has a pituitary tumor, the predominant treatment strategy involves oral medications, although in some dogs (based on MRI results) radiation therapy may also be helpful.

### **Medical therapy for Cushing's disease**

There are several possible medications that can be used for treatment of Cushing's disease. The two most common choices include Mitotane (Lysodren) or Trilostane (Vetoryl). Each medication has its good and bad points and veterinarians may differ in which specific product they prefer to use. Trilostane is our preferred option due to ease of administration, monitoring, and reversibility of effects. This medication is given orally (lifelong) and it acts to inhibit the production of cortisol, thereby reducing excessive blood levels. Each animal is individual in their response to this medication and frequent rechecks and testing are necessary to determine the optimum dosing schedule as well as to monitor for side effects associated with therapy. In some dogs, Trilostane can cause excessive inhibition of hormone synthesis resulting in cortisol as well as aldosterone deficiency (aldosterone is another very important hormone that helps to maintain electrolyte and water balance in the body). It is very important to carefully monitor dogs on this medication so adverse effects can be detected early, and appropriate treatment can be initiated.

### **What is the prognosis for dogs diagnosed with Cushing's disease?**

The average lifespan of a dog diagnosed with Cushing's disease is about two to three years (but there are many variables that can influence this number). Serious life-threatening complications that may occur in some dogs with Cushing's disease include pulmonary thromboembolism (which causes sudden difficulty in breathing), infection in other organ systems (such as bladder, kidney, skin, and respiratory tract), the development of diabetes mellitus, and neurologic signs due to enlargement of the pituitary tumor (in dogs with the pituitary form of the disease). Frequent rechecks and consultations with your veterinarian are the best way to detect and manage many of these complications.