



## CUSHING'S DISEASE

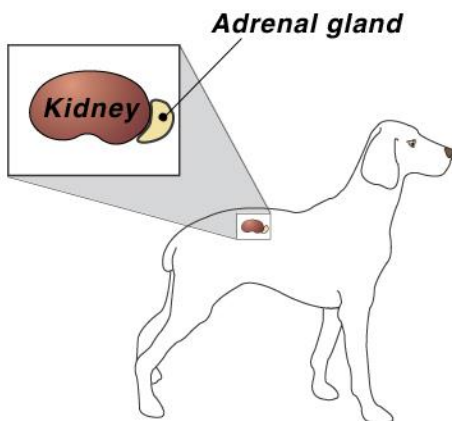
### ***What is Cushing's disease?***

Cushing's disease is a condition in which the adrenal glands overproduce certain hormones. The medical term for this disease is *hyperadrenocorticism*.

The adrenal glands produce several vital substances, which 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.

### ***How does this disease occur?***

There are three mechanisms by which this disease can occur. Regardless of the cause, the clinical signs are essentially the same. It is important to identify the type of Cushing's disease because the various forms are treated differently and each has a different prognosis.



**Pituitary gland tumor.** The most common cause of Cushing's disease (85% of all cases) is a tumor of the pituitary gland. The tumor may be either benign or malignant. The tumor causes the pituitary to overproduce a hormone that stimulates the adrenal glands to produce cortisol. The tumor may be microscopic or large. Depending on the size of the tumor, clinical signs other than Cushing's disease may be present. 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, as long as they take their medication and stay under close medical supervision. Growth of the pituitary tumor

would give the patient a less favorable prognosis.

**Adrenal gland tumor.** Cushing's disease may be the result of a benign or malignant tumor of the adrenal gland. If benign, surgical removal cures the disease. If malignant, surgery may help for a while, but the prognosis is less favorable than for a benign tumor.

**Iatrogenic.** Iatrogenic Cushing's disease means that the excess of cortisol has resulted from excessive administration of a steroid. This may occur from oral or injectable medications.

Although the injections or tablets were usually given for a legitimate medical reason, their excess is now detrimental.

### ***What are the clinical signs?***

The most common clinical signs associated with Cushing's disease are an increase in appetite, water consumption, and urination. Lethargy, or lack of activity, and a poor hair coat are also common. Many of these dogs develop a bloated or "pot-bellied" appearance to their abdomen due to 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. Panting and increased appetite are other common findings with this disease.

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

A number of tests are necessary 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. Other tests are needed to determine which form of the disease is present. Endogenous ACTH levels, High-dose Dexamethasone Suppression (HDDS) test, urine cortisol: creatinine ratio, and 17-hydroxyprogesterone response to ACTH administration tests may also be recommended.



An abdominal ultrasound examination can be a valuable part of the testing process. This permits visualization of the adrenal glands and determines their size and the presence of a tumor. Although some of these tests are somewhat expensive, they are necessary to determine the best treatment and prognosis for your pet.

### ***What are the treatment options?***

#### **Cushing's Disease**

Treatment of this form requires a discontinuation of the steroid that is being given. This must be done in a controlled manner so that other complications do not occur. Unfortunately, it usually results in a recurrence of the disease that was being treated by the steroid. Because there may have been adverse effects on the adrenal glands, treatment is also needed to correct that problem.

#### **Adrenal Tumor**

Treatment of an adrenal tumor requires major abdominal surgery. Although this is a high risk surgery, if successful 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 below .

#### **Pituitary Tumor**

Treatment of the pituitary-induced form of Cushing's disease is the most complicated. There are two drugs commonly used: Anipryl™ and Lysodren™. Anipryl is the only drug approved by the FDA to treat canine Cushing's disease. Anipryl is given daily and has little, if any, side effects. Few blood tests are required when using this medication. Anipryl works directly on the pituitary gland, helping produce more of the hormones that may be diminished with Cushing's disease. Most pets with uncomplicated Cushing's disease (no complications such as diabetes mellitus, etc.) can be treated with Anipryl and most clinical signs will resolve. If a pet does not improve after two to three months of Anipryl therapy, Lysodren™ therapy is often recommended.

Lysodren™ is the primary drug used to destroy the abnormal adrenal gland tissue. Lysodren™ is also known as mitotane or o,p'-DDD. If too little of the drug is used, the abnormal adrenal tissue persists and the disease continues. If too much is used, most or all of the adrenal cortex will be destroyed, which can be life-threatening and result in reduced hormone production by the adrenal glands. This condition is known as Addison's disease or hypoadrenocorticism. Therefore, careful monitoring of the dog is necessary in order to achieve good results. Because the pituitary is not being affected by the treatment, it continues to stimulate the adrenal gland. This means that lifelong treatment is necessary.

Although a cure is not achieved with either treatment, control is possible for many years if the tumor is small. If the tumor is large, local effects of the tumor invading surrounding tissues in the brain can be the limiting factor in survival.

## INSTRUCTIONS FOR LYSODREN TREATMENT OF CUSHING'S DISEASE

Treatment with this drug involves an *initiating phase* and a *maintenance phase*. The *initiating phase* arrests the disease and restores the dog to a more normal state. Some of the clinical signs, especially increased food and water intake, should stop within the first 1-3 weeks. Other signs, such as a poor hair coat or a bloated abdomen, may take several weeks or months to correct. The *maintenance phase* represents the phase of long-term therapy. This phase lasts the rest of the dog's life.

You must continually monitor your dog's food and water intake. We expect both to return to a normal level. Water intake should be less than 1 oz. per pound (66 cc per kilogram) of body weight per day, but don't limit the water if your dog needs to drink more. Your dog should drink \_\_\_\_\_ ounces (\_\_\_\_\_cc) per day. The amount of food should also be measured each day. At least two feedings per day are preferred.

### Initiating Phase

1. Give \_\_\_\_\_ Lysodren™ tablet(s) one time per day beginning on \_\_\_\_\_ for 9 days or until one of the following occurs:

a) Your dog's water intake drops to 1 oz. per pound (66 cc per kilogram) per day or \_\_\_\_\_ per day.

b) Your dog's appetite returns to normal or it takes 15-30 minutes to eat when it would normally eat in much less time.

c) Your dog does not eat a regular meal.

d) Your dog vomits.

e) Your dog has diarrhea.

e) Your dog becomes unusually listless.

2. Return in nine days or when one of the above occurs for another ACTH stimulation test. This test should be done early in the morning and will require your dog to be in the hospital for about 4-5 hours. If the test is abnormal, the initiating phase will continue. If the test is normal, the maintenance phase will begin.

3. If loss of appetite, vomiting, diarrhea, or listlessness occurs, give \_\_\_\_\_ tablet(s) (\_\_\_\_\_ mg) of hydrocortisone twice daily for two days. DISCONTINUE THE LYSODREN™ TABLETS. If vomiting prevents oral administration, your dog must be seen by a veterinarian for administration of proper medication by injection. When you begin this treatment, please call us for consultation and instructions.

Following the first two days of treatment with \_\_\_\_\_ tablet(s) twice daily, give \_\_\_\_\_ tablet(s) twice daily for two more days, then \_\_\_\_\_ tablet(s) twice daily for three days, then \_\_\_\_\_ tablet(s) once every other day for one week. At the end of that time, make an appointment so we can assess the situation and give you further instructions on Lysodren administration.

4. Report any other changes in your dog's behavior that are out of the ordinary. This disease and this treatment can result in several abnormal behaviors. However, your dog can also have other diseases that occur concurrently but independently of Cushing's Disease. It is important that we differentiate between the two situations so that proper treatment can be taken.

5. Stay cautiously optimistic. This is a serious disease, but many dogs with Cushing's Disease enjoy a greatly improved quality of life for many years.

#### Maintenance Phase

When regulated, your dog will take Lysodren™ approximately once weekly. An ACTH stimulation test will be necessary about every 3-4 months to be sure that regulation is satisfactory. At the appropriate time, the specifics of the maintenance phase will be explained.

Give \_\_\_\_\_ tablet(s) every \_\_\_\_\_ days.

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*This client information sheet is based on material written by Ernest Ward, DVM.  
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