

Hyperadrenocorticism (Cushing's Syndrome)

What is Cushing's Syndrome?

Hyperadrenocorticism, or Cushing's Syndrome, is one of the most commonly diagnosed canine endocrine disorders. It is a condition in which **excess levels of the hormone cortisol are produced** (cortisol is the hormone that is normally released from the adrenal gland into the bloodstream at times of stress, and it has many actions similar to those of steroid drugs). Subsequently, dogs suffering Cushing's Syndrome can have many of the unwanted symptoms of steroid excess which can weaken their immune system and damage many tissues in their body. This syndrome is seen most commonly in middle-aged to older dogs and can be either spontaneous or iatrogenic (caused by other treatments such as steroid medications).

Spontaneous causes of Cushing's Syndrome:

There are two main spontaneous causes.

1. Pituitary-Dependent Hyperadrenocorticism (PDH)

- 80-85% of cases.
- Commonly seen in: Poodles, Dachshunds, Terriers.
- Most dogs with PDH are found to have pituitary microadenomas (80%) (tiny tumours located in the pituitary gland of the brain, not requiring treatment). 20% of cases may have macroadenomas (in which the tumour size is larger and there may be neurological clinical signs relating to this mass occupying space in the brain).
- PDH results in excessive hormone (ACTH) production from the brain which in turn stimulates the adrenal glands to produce too much steroid (ie cortisol). This usually results in enlargement of adrenal glands – can be noted on ultrasound examination.

2. Adrenal Tumours (AT)

- 15-20% of cases.
- Commonly seen in larger breed dogs.
- 50% of AT's are adenomas (benign, non-invasive tumours), however the other 50% of AT's are carcinomas which can result in metastatic disease to the liver, lungs, and

kidneys. This usually results in the enlargement of one of the adrenal glands, and the shrinkage (atrophy) of the opposite adrenal gland (due to the natural body's signals back to the brain trying to decrease the amount of cortisol in the blood).

Cushing's syndrome cannot typically be cured with medication, but it can be successfully managed. Proper diagnosis, monitoring, and accurate treatment adjustments are essential elements in successfully managing Cushing's syndrome.

Cushing's Syndrome Clinical Signs

Characteristic signs are:

- Excessive urination and possible incontinence
- Excessive drinking
- Ravenous appetite
- Lethargy or decreased activity
- Excessive panting at rest
- Pot belly + weight-gain
- Thin skin & loss of skin elasticity
- Hair loss (usually sparing the head and limbs) and recurrent skin diseases
- Muscle wasting

Your dog may not necessarily display all of these signs. Often owners may misinterpret the earlier signs of Cushing's Syndrome as ageing as they may slowly develop over time.

Other side-effects of Cushing's Syndrome include:

- Weakening of muscles and connective tissues
- Fatty deposits in the liver
- High cholesterol
- High blood pressure
- Eye damage which can lead to sudden blindness

The good news is most of the problems associated with Cushing's can be reversed or at least minimised by effective treatment.

Cushing's Syndrome Diagnosis

A blood and urine test are usually performed in order to first identify the likelihood of Cushing's Syndrome. These tests usually note a "Stress Leukogram" (white

blood cell frequencies changing in response to the increased cortisol in the blood), elevated cholesterol, elevated liver enzymes, and quite commonly dilute urine (from excessive drinking) and urinary infections are also seen.

In order to confirm a diagnosis of Cushing's Syndrome we will perform additional blood tests: an ACTH stimulation test, or a Low Dose Dexamethasone Suppression Test (LDDS test), or both.

- **ACTH Stimulation Test:** During this test we will take a sample of blood to test the dog's initial cortisol level and then provide the dog with an IV injection of ACTH. We will then collect a second blood sample 1 hour after drug administration. We will therefore need to have your dog at our clinic for just over 1 hour in order to perform this test.
- **LDDS Test:** During this test we will take a sample of blood to test the dog's initial cortisol level and then provide the dog with an IV injection of a steroid (dexamethasone) IV. We will then collect a second and third blood sample at 3 and then 8 hours after drug administration. We will therefore need to have your dog at our clinic for just over 8 hours in order to perform this test. Occasionally this test allows us to differentiate whether your dog has the PDH or AT form of Cushing's Syndrome.

Ultrasound Examination: This may also be performed if differentiation between the two forms of PDH and AT is required. This can help us to identify the sizes of both of your dog's adrenal glands.

Cushing's Syndrome Treatment

Monitoring:

Proper monitoring of these patients is essential to ensure optimal treatment results. Follow-up appointments, and pet owner understanding of the

condition and reporting of any signs of change in their pet are important to the treatment process.

Medical Therapy:

This is considered the best way to manage the PDH form of Cushing's Syndrome, as well as the AT form if surgery is not indicated or not an option.

Vetoryl (Trilostane) or **Lysodren (Mitotane)**: These medications reduce cortisol production and should be titrated according to individual response as determined by monitoring of clinical signs, physical examination and laboratory test results. In most cases medication is used lifelong for Cushing's disease.

Surgical Therapy:

This is only may be indicated if your dog has an AT form of Cushing's Syndrome in which the removal of one adrenal gland and its functional adrenal tumour will result in the resolution of the abnormal cortisol levels. This procedure is known as an adrenalectomy and can be performed at specialist surgery animal hospitals.

Ongoing Management

Once medical therapy has been initiated, we will want to test your dog's blood biochemistry and perform ACTH stimulation tests (*discussed above*) 10-14 days later, 30 days later, 90 days later, and every 3 months thereafter. This will help us to ensure that your dog's Cushing's Syndrome is being managed appropriately. We will normally ensure that you have provided your dog with their medication with food 4-6 hours prior to us testing their blood cortisol levels (this will help ensure that we are obtaining results when the dog's cortisol levels will be at their lowest (at the peak time of the drugs effect)).

We may adjust your dog's medication dose depending on these ACTH stimulation results.

If you have any concerns at any time, please call us on (08) 9384 2644.

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