

Cushing's Disease

Cushing's syndrome is the resulting set of symptoms observed when the body is exposed to excess cortisone (or related hormones) over a long period of time. Cortisone, or more correctly cortisol, is a hormone produced by the adrenal glands that are located atop the kidneys. Cortisol is stored in the adrenal gland and is released in times of stress as it helps our bodies prepare for a fight or flight situation. It adjusts the metabolism to expect physical exertion by mobilizing fat and sugar stores and retaining sodium and water. It puts us in a state of "break down" so that our stored resources can be used quickly. However, if the body is exposed to this hormone most of the time instead of only for short stressful periods, the state of break down becomes debilitating. There are several mechanisms that can lead to Cushing's syndrome and, as they are treated differently, it is important to determine which one is at work in a given animal. In the normal body, the pituitary gland, which is located at the base of the brain, can detect when cortisol levels in the blood are declining. In response, the pituitary secretes a stimulating substance, called ACTH, which causes the adrenal gland to release more cortisol. When the pituitary gland detects that cortisol levels are again appropriate, it stops its stimulatory message. You can think of the pituitary gland as a sort of a thermostat for cortisol. This raising and lowering of cortisol blood level is regulated throughout the day via ACTH secretion and it occurs rapidly.

Pituitary-Dependent Cushing's Syndrome

This form of Cushing's accounts for 85% of dogs with Cushing's syndrome. Basically, the pituitary gland grows a small tumor. The tumor is generally too small to cause any trouble and is usually a benign tumor. This tumor, however, over-produces ACTH, thus leading to over-stimulation and enlargement of both adrenal glands and an over-production of cortisone. Occasionally, in about 10% of pituitary-dependent Cushing's dogs, these benign pituitary tumors are large enough to compress the brain. In these cases, neurological signs may be observed; these cases are unusual but hard to treat (see macrotumors).

Adrenal-Dependent Cushing's Syndrome

In 15% of dogs with Cushing's syndrome, an adrenal tumor is directly over-producing cortisone. The tumor is often large enough to see with radiographs or ultrasound and may be malignant. There is little or no production of ACTH from the pituitary gland, and as a result the opposite adrenal gland is usually atrophied or small.

Overuse of Cortisone-Type Hormones

Cortisone derivatives may well be the most over-used drugs in veterinary medicine. Their anti-inflammatory actions soothe such common maladies as allergic skin disease (especially flea allergic dermatitis) and degenerative arthritis. Relief is usually rapid and many owners find themselves requesting "cortisone" shots or pills over and over again. In time, Cushing's syndrome can result, not from any inherent disease in the pet's system, but from the effects of the hormones given over the long term.

The pituitary gland perceives the high steroid levels yielded by the medication and does not send stimulation to the adrenal glands. In time, the adrenal glands atrophy and they are not able to release cortisone on their own should they be required to do so. This effect lasts as long as three months after the cortisone medication has been discontinued. To allow the adrenal to gradually recover, cortisone pills are usually prescribed in a decreasing dose, rather than a sudden stoppage; an owner should never discontinue the pills suddenly. Commonly prescribed cortisone derivatives include: Vetalog, prednisone, prednisolone, dexamethasone, Depo-Medrol, triamcinolone and others. These medications have important parts to play in medicine but they must be respected and not used indiscriminately, nor discontinued suddenly after prolonged use.