



24 Hour Emergency &  
Referral Hospital

## Toronto Veterinary Emergency Hospital

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## Adrenal Cortex Tumors

These notes are provided to help you understand the diagnosis or possible diagnosis of cancer in your pet. For general information on cancer in pets, ask for our handout "What is Cancer". Your veterinarian may suggest certain tests to help confirm the diagnosis and assess treatment options and likely outcomes. Because individual situations and responses vary, and because cancers often behave unpredictably, science can only give us a guide. However, information and understanding about tumours and their treatment in animals is improving all the time.

We understand that this can be a very worrying time. If you have any questions please do not hesitate to ask us.

### What is the function of endocrine glands?

Endocrine glands produce specialized chemicals called "hormones". These regulate and integrate many activities to maintain internal stability of the body. The hormones pass directly into the blood to affect target cells elsewhere. The endocrine system includes the adrenal glands, thyroid gland, parathyroid gland, pituitary gland and specialized cells in the pancreas called the Islets of Langerhans. Some cells in other tissues throughout the body also produce certain hormones.

The pituitary gland at the base of the brain links to the other endocrine glands and regulates hormone production by the adrenals, thyroid and sexual organs as well as growth and the body's day-to-day cycles of activity (diurnal rhythm).

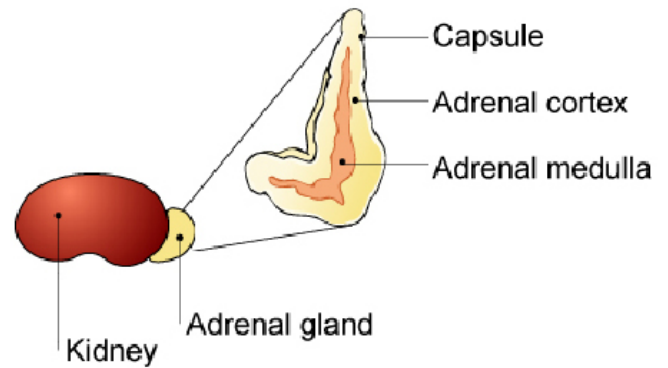
### What are the adrenal glands?

The adrenals are a pair of distinct endocrine glands, located close to the kidneys.

Each adrenal gland has two parts. The outer part (cortex) is controlled by a hormone (adrenocorticotrophic hormone or ACTH) from the pituitary gland. The cortex produces steroid hormones of several types. One group (mineralocorticoids, e.g., aldosterone) acts with the kidney to control salt concentrations in the body, while a second group includes the sex hormones. The

third type (glucocorticoids, e.g., cortisol) has many actions including reduction of inflammation, healing and activity of the immune system. This hormone also controls carbohydrate and fat metabolism in conjunction with other hormones from the pancreas.

The inner part (medulla) of the gland produces neuroendocrine hormones (e.g., adrenaline or epinephrine) with effects similar to those of the sympathetic nervous system.



## What tumours occur in the adrenal cortex?

Tumours of the cortex of the adrenal glands may be hyperplasia (non-cancerous cell overgrowths) or cancers, either benign (non-spreading) or malignant (spreading). Usually they produce hormones that will have secondary clinical effects elsewhere in the body.

## What do we know about the cause?

These tumours often develop after prolonged stimulation of the adrenal cortex. The stimulation may be due to overproduction of pituitary hormones that control the gland, or an excess of these or similar hormones from an external source such as medicines. Sometimes disruption of the natural regulation of hormone production ('feedback control') by the gland results in over-stimulation.

Cancer induction is a multi-step process called 'tumour progression'. There is a continuous spectrum of abnormal change ranging from small areas of hyperplasia to benign and then malignant cancer. Some cancers never progress past the first stages so remain benign. Others progress rapidly.

## Why has my pet developed this cancer?

Some animals have a greater tendency (genetic susceptibility) to cancer. Some breeds have far more cancers than others, often of specific types. In many cases, these tumours need prolonged stimulation to start growing and, sometimes, to enable them to persist.

## Are these common tumours?

None of these tumours are common. Tumours of the pituitary gland, which produce the hormone ACTH result in over-stimulation of the adrenal cortex, leading to clinical signs associated with adrenal cortical hormone excess. Such pituitary tumours are much more common than primary tumours of the adrenal itself.

In dogs, benign tumours of the adrenal cortex are the most common type and are seen in older animals. Adrenal tumours of all types are rare in cats.

## How will these cancers affect my pet?

The clinical signs of primary pituitary tumours that secondarily affect the adrenal glands, and the signs of primary tumours of the adrenal cortex are the same. These signs include increased appetite and thirst, loss of hair, dry skin and "blackheads" on the belly. Some animals develop hard masses in the skin on the neck and back (from calcium deposits, a symptom called

calcinosis cutis), which may ulcerate or become infected. The hormones cause redistribution of body fat and weakening of muscles, so the abdomen sags or appears "pot-bellied". The immune system is damaged, so infections persist for longer than normal. Some dogs are also diabetic. Some tumours of the adrenal cortex produce excessive sex hormones. Malignant adrenal cancers may spread through the body by invading the adjacent blood vessels and seeding new tumours in body cavities and other organs. Animals may also be asymptomatic if the tumour is hormonally inactive and has not significantly invaded local blood vessels or organs.

## How are these cancers diagnosed?



Advanced diagnostic imaging such as ultrasound may be required



This type of cancer is often suspected based on the typical clinical signs. X-rays, ultrasound and MRI (magnetic resonance imaging) or CT (computerized tomography) scans may be useful in detecting the tumours, including metastases.

Blood tests help to identify functional tumours of the pituitary and adrenal cortex. To diagnose the tumour type precisely, it is necessary to examine the tumour itself. This involves exploratory surgery, often with total removal of the tumour. The tissue samples are submitted for microscopic examination using a diagnostic technique called histopathology. Specially prepared and stained tissue sections are made at a specialized laboratory where the slides will be examined by a veterinary pathologist.

## What types of treatment are available?

Primary adrenocortical tumours may be removed surgically or managed medically, depending on the individual case.

## Can these cancers disappear without treatment?

It is not common, but the loss of blood supply to a cancer can make the cells die. Unfortunately, the disappearance of the cancer is rarely complete.

## How can I care for my pet?

After any surgery, you need to prevent your pet from interfering with the operation site and to keep it clean. Any loss of stitches or significant swelling, redness, discharge or bleeding should be reported to your veterinarian. Your veterinarian will provide further advice regarding medications, diet, follow up appointments, etc. If you require additional advice on post-surgical care, please ask.

Medical treatment of these tumours involves the use of drugs with potentially serious side effects, so monitoring of your animal is essential. Be sure that you understand what you should check, how frequently and any signs you should look out for.

## How will I know how the cancer will behave?

Histopathology will give your veterinarian the diagnosis that also helps to indicate how a tumour is likely to behave. Based on the specific diagnostic information that has been obtained, your veterinarian may be able to predict how the specific tumour in your pet is likely to respond to treatment and behave in the future.

## When will I know if the cancer is permanently cured?

'Cured' has to be a guarded term in dealing with any cancer.

**"It is more probable that ongoing medical treatment will be necessary."**

Adrenal cortical tumours that can be treated surgically may be cured, but it is more probable that ongoing medical treatment will be necessary. The treatment requires regular monitoring and life expectancy is variable.



## Are there any risks to my family or other pets?

No, these are not infectious tumours and are not transmitted from pet to pet or from pets to people.

Reviewed and edited May 2014 by Kelly D. Mitchell, DVM, DVSc, DACVIM, Internal Medicine Specialist at the Toronto Veterinary Emergency Hospital

*This client information sheet is based on material written by: Joan Rest, BVSc, PhD, MRCPath, MRCVS*

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