



# PET TALK

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## WHAT IS HYPERADRENOCORTICISM OR FELINE CUSHING'S SYNDROME (FCS) IN MY CAT?

### *What is this disease?*

In the domestic cat, hyperadrenocorticism also known as feline Cushing's syndrome (FCS), is a hormone disorder caused by an elevation in cortisol concentrations. This elevation is usually derived from a tumor of the pituitary gland or adrenal gland. The pituitary gland is a pea size gland located in base of the cat's brain whereas the adrenal glands are bilateral and located directly above each of your cat's kidneys. FCS prevalence in America is fairly rare with approximately 100 cats diagnosed with the disease as of 2002. However, due to awareness of this disease process, more cats are currently being diagnosed.



### *What causes FCS in cats?*

As with most hyperplastic or neoplastic diseases, we do not know the exact cause of hyperadrenocorticism in domestic cats but it is believed to have several causes. The most common sources are either an adrenocorticotrophic hormone (ACTH) secreting tumor of the

pituitary gland or a cortisol-secreting tumor of the adrenal cortex. Most pituitary tumors are benign (harmless) and pituitary dependent disease accounts for approximately 80% of cases of FCS. Almost 2/3 of adrenal tumors associated with FCS are also benign but the remaining 1/3 are malignant adenocarcinomas. Cats in general are considered less prone the deleterious effects of glucocorticoids than dogs so this may explain why there is a lower incidence of naturally occurring Cushing's disease in cats. There is another cause and though rare, is very severe and this is called iatrogenic or drug associated Cushing's syndrome. This usually occurs when a cat has been on a high dose steroid such as prednisolone or dexamethasone, for an extended period of time. There does appear to be a slight breed predilection in Siamese, Persians, Abyssinians, and domestic long hairs but a majority of cats that have been affected are domestic shorthairs with a trend towards females being affected more than males.

### *How will I know if my cat has FCS?*

As the owner of your cat, you spend the most time around them so you will probably be the first to notice if something is amiss

with your favorite feline. The classical signs of hyperadrenocorticism are fairly distinct. They are usually observed in middle-age to older cats with an age range of 5 years to 16 years of age. This disease is also witnessed in cats that are on chronic corticosteroid medications such as prednisolone. These cats will present with dermatologic abnormalities such as hair loss, thinning of the skin, belly enlargement, lethargy, panting, frequent thirst, frequent urination, and either significant weight loss or gain. Cats with Cushing's may also exhibit skin that lacerates easily, curled ears, and bruising of the skin. If you notice any of these symptoms, immediately set up an appointment with your veterinarian so further diagnostics

*Continued on Page 2*

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*Continued from Page 1*

can be performed on your furry friend. Your cat may also have a secondary condition of diabetes mellitus. This secondary disease state presents in up to 90% of cats with FCS and occurs when cortisol interferes with the effects of insulin and can make treating diabetes very difficult! If you know your cat is already diabetic, then you definitely want to talk with your veterinarian about ways to keep their diabetes under strict control with diet, exercise, and medications.

#### ***What are symptoms of AAE?***



The classical clinical symptoms of feline Cushing's syndrome will be seen in middle-age to older cats with an average of about 10 years and is observed slightly more so in domestic shorthair, female cats. The symptoms may include abdominal enlargement, muscle wasting, thinning of the skin, bruising of the skin, tearing of the skin, fur loss, fur that falls off easily especially during routine grooming, an unkempt coat, weight gain, weight loss, increased thirst, increased urination, and increased appetite. Owners may also notice virile and estrus-like behavior may occur in spayed or neutered cats with adrenal tumors secreting steroids other than cortisol.



#### ***Can FCS be treated?***

In general, medical management of hyperadrenocorticism is less successful in the cat than in the dog. Moreover, cats with FCS are often poor surgical candidates especially when they have uncontrolled diabetes making overall treatment success very problematic. However, the decision to elect for surgery ultimately depends on the overall clinical picture of the presenting cat and whether or not the source of FCS is based in the pituitary or adrenal gland. Some medication options include trilostane, metyrapone, mitotane, and ketoconazole. Other non-medication approaches include radiation therapy, adrenalectomy, and microsurgery.

##### **1. *Vetoryl*<sup>®</sup> (*trilostane*)**

This is a medication that blocks the production of many adrenal steroids including cortisol and aldosterone. It is currently the most effective drug for medical management of cats with PDH. You may need your pharmacist to compound this medication as it only comes in certain capsule sizes based on dog weights since this medication is not FDA approved in cats. Treatment with this medication may improve clinical signs but cats typically remain diabetic. The drug is generally

well tolerated and is reportedly effective in controlling frequent thirst, frequent urination, and skin changes. Adverse effects are usually mild and self-limiting and include diarrhea, vomiting, and lethargy. This drug should not be used in pregnant animals or handled by pregnant cat owners.

##### **2. *Metopirone* (*metyrapone*)**

This medication blocks the formation of cortisol. It has been successfully used to treat hyperadrenocorticism in the cat. Side effects may include sedation, dizziness, and abdominal discomfort. While helpful, there are no reports of a completely successful cure with metyrapone as the sole treatment for FCS in the cat.

##### **3. *Lysodren* (*mitotane*)**

This medication is actually the mainstay of medical therapy for dogs with HAC and its use in cats is questionable at best demonstrating only a partial response. Though its use is not recommended, if given to your cat, side effects may include stomach upset, fatty degeneration, liver damage, and occasionally neurologic signs. This drug should never be given to animals that are not eating well.

##### **4. *Nizoral* (*ketoconazole*)**

This medication is an antifungal that has been used in other species for hyperadrenocorticism; however results have been disappointing in FCS cats. On the other hand, this drug is well tolerated in cats so it may be reasonable to consider its use in the medical management of Cushing's in

*Continued from Page 2*

cats just note that most results are disappointing with partial responses observed in only a few felines. Side effects are relatively unusual but can include mild liver damage.

#### 5. *Radiation therapy*

This technique is another option besides oral medication, for treating cats that have been diagnosed with pituitary dependent hyperadrenocorticism. The amount of radiation used depends on the type and stage of disease being treated. Resolution of neurologic signs, improved clinical signs, and improved glyce-mic regulation with better response to insulin has been reported after radiation treatment. Improvement occurs approximately 1 to 5 months after completion of radiation therapy. Average survival time after treatment has been observed at 15 months and 17 months. Early treatment while tumors are small is most effective and improves prognosis and longevity of these cats. Complications of radiotherapy appear to be minimal in most cases with temporary fatigue and the disadvantages of this treatment include its high cost and limited availability. Mild ear irritation may develop in one or both ears during the 3rd week of treatment but a topical medication from your veterinarian can be used to resolve this side effect.

#### 6. *Adrenalectomy*

Given the lack of effective medical options for the treatment of FCS, this procedure is often considered the treatment

of choice in cats with functional adrenal tumors although initial medical treatment may be necessary in severely debilitated cats. Cats with diabetes mellitus require careful management of insulin requirements before surgery can be performed. After surgery complications can be very severe including electrolyte abnormalities, skin lacerations, inflammation of the pancreas, low blood sugar, pneumonia, blood clots, and infection.

#### 7. *Microsurgery*

Although not widely practiced, microsurgery has been reported as a treatment for pituitary-dependent feline Cushing's disease in the cat. However there are very few veterinary surgeons skilled in this microsurgical technique at this time of writing so the cost may be beyond what most owners can afford.

#### ***Should I treat my cat if they are diagnosed with FCS?***

If your pet cat has been diagnosed with hyperadrenocorticism, or FCS, you should treat them to the best of your abilities. If your veterinarian feels your cat is a good candidate for adrenalectomy surgery, this is the gold standard. However, if your pet not a good surgical candidate perhaps because they are too ill to undergo anesthesia or have uncontrolled diabetes making surgery very risky, then medication therapy may be the better option. If your cat's pituitary gland is affected and your veterinarian offers radiation therapy, this may also be an option for your cat.

#### ***Feline Fun Facts***

- Cats are purely carnivorous and their diets should reflect this
- An indoor cat can live 15 years or more, but the average lifespan of an outdoor cat is only 2-4 years
- Groups of kittens are "kindles," while groups of adult cats are "clowders"
- Intact female cat is called a "queen" and a young or spayed female a "molly" while intact males are "toms" and neutered males called "gibs"
- One litter of kittens can be produced by more than one father
- Cats have five toes on each front foot, but only four on each back foot.
- Cats will spend about 1/3 of the day grooming-note backwards facing spikes on their tongues
- They will spend about 16 hours a day sleeping.
- Sir Isaac Newton invented the cat door
- Cats can be trained to use the toilet as their litter box



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