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## **Signs, Symptoms and Diagnosis of Feline Hyperthyroidism**

There are many clinical signs associated with feline hyperthyroidism. The hallmark sign is weight loss despite excellent appetite.

Hyperthyroid cats are also extra thirsty and are sometimes brought to the vet because they are drinking so much water. They are commonly restless and especially demanding of attention and/or food. Many cats have chronic intermittent vomiting or diarrhea and may be urinating in inappropriate locations.

In a normal cat, the lobes of the thyroid gland cannot be felt with your fingers. In the hyperthyroid cat, at least one lobe is usually prominent and may be detected by your veterinarian during a physical exam.

**\*\*HYPERTHYROIDISM IS GENERALLY A DISEASE OF OLDER CATS.**

**\*\*THE AVERAGE AGE AT DIAGNOSIS IS ABOUT 13.**

### **How to Tell if a Cat is Hyperthyroid**

A blood panel is often ordered in the diagnostic work-up of any significant clinical signs. The blood panel surveys hepatic, renal, hematologic, and other body systems. Although there are multiple changes that fit hyperthyroidism, mild increases in liver enzymes are most commonly observed indicating mild (usually clinically insignificant) damage to the liver and/or bones. The elevated T4 level forms the basis for diagnosis; there can be no other diagnosis in such a case.

If T4 is markedly elevated, the diagnosis is clear. Some cats have borderline results and require further testing.

### **When T4 Levels are Borderline**

In older cats, the normal range for T4 is much lower than it is for young adult cats and thus sometimes it is not obvious whether a cat is truly hyperthyroid. Further, T4 levels are readily reduced by other disease states and there is some normal but unpredictable fluctuation in T4 throughout the day.

The easiest tests for your veterinarian to perform are called the T3 suppression test and the equilibrium dialysis free T4. To do the T3 suppression test, the owner must be able to give the cat a pill three times a day for two days and return to the vet's office for a blood test on the third day. In other words, some specific scheduling is necessary and the cat must be able to take pills.

The pill given is a T3 pill, active thyroid hormone. After two days of exposure to this medication, a normal thyroid will respond by reducing its T4 production. In a hyperthyroid cat, this negative feedback mechanism is not operating and the T4 level will not drop. Even borderline cases can be sorted out.

The Equilibrium Dialysis Free T4 represents a certain form of thyroid hormone, the part that is not bound to blood proteins as measured by a laboratory technique called equilibrium dialysis. Unlike T3 and total T4 measurements, the equilibrium dialysis free T4 is not as subject to the influence of non-thyroidal illness. For example, it is normal for total T4 levels to drop when you are sick; however, the free T4 portion remains unchanged. In this way, a hyperthyroid cat that is sick from another disease might have a T4 in the normal or borderline range, but the equilibrium dialysis free T4 would still be high enough to confirm the hyperthyroid condition. The equilibrium dialysis free T4 is a simple blood test that can be run on any serum sample, though sometimes it must be sent out to a laboratory, thus requiring a few days for results.

Of course, a nuclear medicine scan will also identify a hyperthyroid cat readily. The equipment necessary is only available in a limited group of radiotherapy facilities.



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### **What Causes Hyperthyroidism?**

Hyperthyroidism is caused by a benign growth in the thyroid gland that is over-producing T4. It is important to realize that these tumors are almost always benign and represent a form of goiter rather than a form of cancer. Less than 3 - 5 % of hyperthyroid cats have a cancerous thyroid growth.

Many people want to know what caused their cat's thyroid gland to grow a tumor, benign or otherwise. A study published in the Journal of the American Veterinary Medical Association in March of 2004 shows some interesting information. There is a strong correlation between eating canned food and developing hyperthyroidism later in life; in fact, cats who eat only canned foods from "pop-top" type cans have five times the risk of developing hyperthyroidism relative to cats who eat only dry food. Cats whose diet is 50% canned food have 3.5 times the risk of developing hyperthyroidism relative to cats who eat only dry food. It has been speculated that pop-top type aluminum cans are lined with a substance called bisphenol-a-diglycidyl ether, which is transferred into food containing oils or fats. In areas of the world where this type of can is not used for cat food, hyperthyroid is not a common disease. Still, it is important to realize that a good 25% of hyperthyroid cats have never eaten canned foods in their lives, so there is clearly more than one factor at work.

Another study by Dye et al. looked at exposure to brominated flame retardants (polybrominated diphenyl ethers specifically) as a factor in the development of feline hyperthyroidism. These chemicals have become largely ubiquitous in the home in the last 30 years, about the same time that feline hyperthyroidism went from an extremely rare disease to an extremely common disease. They looked at PBDE levels in young cats, older normal cats, and older hyperthyroid cats and while they readily found PBDE in the blood samples tested they did not find any difference in levels between cats with or without hyperthyroidism. We mention this study as it received a great deal of press attention when it first came out leading many people to read the "headline" that PBDE's were being investigated as a cause of hyperthyroidism in cats and miss the conclusion that no significant difference in groups was found. It should be mentioned that indoor lifestyle is definitely correlated to increased chance of a cat being diagnosed with hyperthyroidism. This has led to an assortment of speculations as to why this is:

"Is there a chemical in cat litter involved?"

"Is there some other household chemical involved?"

"Do indoor cats simply have a greater likelihood of reaching the age at which hyperthyroidism develops? (While this is certainly true, we do not know if this is the whole story about why indoor cats have an increased rate of diagnosis.)"

"Are indoor cats more likely to see the vet and have diagnostic testing while outdoor cats simply go undiagnosed?"

Purebred cats, especially the Siamese and Himalayan breeds, appear to have a decreased incidence of hyperthyroidism (meaning they are less likely to develop this condition). This implies that there are genetic factors at work as well.

### **Why is it so Important to Treat Hyperthyroid Cats?**

Hyperthyroid cats frequently experience reduced quality of life through weight loss, muscle deterioration, chronic vomiting or chronic diarrhea. Not all cats experience these signs at the time of diagnosis but there are less visible reasons to treat: heart disease and high blood pressure. These problems can result in heart failure, sudden blindness, or sudden death and all can be prevented with timely treatment for thyroid disease.