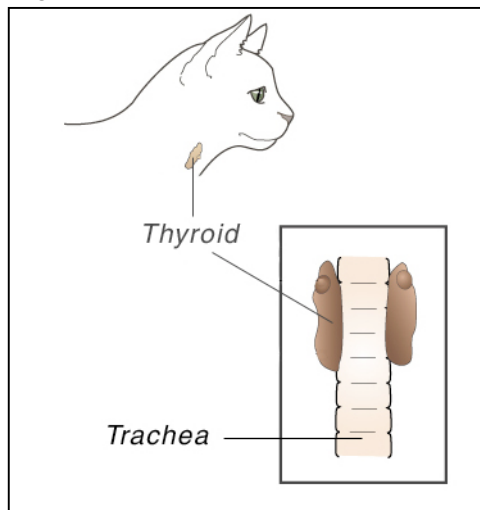


## FELINE HYPERTHYROIDISM

The thyroid glands are located in the neck and play a vital role in regulating the body's metabolic rate. Hyperthyroidism is a disorder characterized by the overproduction of thyroid hormone and a subsequent increase in the metabolic rate. This is a fairly common disease of older cats. Although the thyroid gland enlarges, it is usually a benign or non-malignant change. Less than 2% of hyperthyroid cases involve malignant thyroid gland tumors.

Many organs are affected by hyperthyroidism, including the heart. The heart is stimulated to pump faster and more forcefully; eventually, the heart enlarges to meet these increased demands for blood flow. The increased pumping pressure leads to a greater output of blood and high blood pressure. About 25% of cats with hyperthyroidism have high blood pressure.



### ***Are certain cats more likely to develop hyperthyroidism?***

Older cats are at increased risk for developing hyperthyroidism. Environmental and dietary risk factors have been investigated and may play a role in predisposing some cats to hyperthyroidism, although the specific mechanisms are not known. No individual breed is known to be at increased risk, although the Siamese appears to have a somewhat increased incidence of hyperthyroidism compared to other breeds.

### ***What are the clinical signs of hyperthyroidism?***

The typical cat with hyperthyroidism is middle aged or older. The average age of affected cats is approximately twelve years. The most common clinical sign of hyperthyroidism is weight loss secondary to the increased rate of metabolism. The cat tries to compensate for this with an increased appetite. In fact, some of these cats have a ravenous appetite and will literally eat anything in sight! Despite the increased intake of food, most cats continue to lose weight. The weight loss may be so gradual that some owners will not realize it has occurred, or the weight loss may be quite rapid. Affected cats often drink a lot of water and urinate more frequently. There may be periodic vomiting or diarrhea, and the fur may appear unkempt. In some cats, anorexia develops as the disease progresses.

Two secondary complications of this disease can be significant. These include *hypertension* (high blood pressure) and heart disease called *thyrotoxic cardiomyopathy*. Hypertension develops as a consequence of the increased pumping pressure of the heart. In some cats, blood pressure can become so high that retinal hemorrhage or detachment will occur and result in blindness. Heart problems develop because the heart must enlarge and thicken to meet the increased metabolic demands. Both of these problems are potentially reversible with appropriate treatment of the disease.

### ***What causes hyperthyroidism?***

Some of the risk factors for hyperthyroidism have been defined above. A specific cause for hyperthyroidism has not been identified. The possible role of dietary iodine continues to be investigated as a dietary influence on development of hyperthyroidism.

### ***How is hyperthyroidism diagnosed?***

In most instances, diagnosis of this disease is relatively straightforward. The first step is to determine the blood level of one of the thyroid hormones, called total thyroxine (or  $TT_4$ ). Usually, the  $TT_4$  level is so high that there is no question as to the diagnosis. Occasionally, a cat suspected of having hyperthyroidism will have  $T_4$  levels within the upper range of normal. When this occurs, a second test, usually either a Free  $T_4$  by Equilibrium Dialysis ( $FT_4$  by ED) or a  $T_3$  Suppression Test, is performed. If these tests are not diagnostic, a thyroid scan can be performed at a veterinary referral center or the  $TT_4$  can be measured again in a few weeks.

### ***How is hyperthyroidism treated?***

Because less than 2% of cats with hyperthyroidism have cancerous growths of the thyroid gland, treatment is usually very successful.

Several tests are performed before choosing any form of treatment. These tests are needed to evaluate the overall health of the cat and predict the chances for treatment complications. Such tests include blood tests, urinalysis, and x-rays, EKG, blood pressure determination. Cardiac ultrasound or echocardiography may be recommended based on your cat's condition.

There are three choices for treatment; any one of them could be the best choice in certain situations. Many factors must come into consideration when choosing the best therapy for an individual cat. The three treatment options for hyperthyroidism are:



1. **Radioactive iodine.** A very effective way to hyperthyroidism is with radioactive iodine therapy ( $I^{131}$ ). It is given by injection and destroys all abnormal thyroid tissue without endangering other organs. Treatment requires one or two weeks of hospitalization at a veterinary hospital licensed to administer radiation therapy.

2. **Surgery.** Surgical removal of the affected thyroid lobe(s) is also very effective. Because hyperthyroid cats are usually over eight years of age, there is a degree of risk involved. However, if the cat is otherwise healthy, the risk is minimal. If the disease involves both lobes of the thyroid gland, two surgeries may be required, depending on the surgeon's choice of procedures. In many cats, only one thyroid lobe is abnormal, so only one surgery is needed.

If surgery is the treatment method chosen, the cat is often treated with an anti-thyroid medication for several weeks prior to the operation. During that time, the ravenous appetite should subside and the cat will probably gain weight. Some cats also have a very fast heart rate and high blood pressure; these problems can be managed with medication before surgery.

The cat is generally hospitalized for one night following surgery and returns home feeling quite well. It should eat normally after returning home. One to two weeks, after surgery, another  $TT_4$  level is measured.

3. **Oral medication.** Administration of an oral drug, methimazole (Tapazole®), can control the effects of the overactive thyroid gland. Some cats have reactions to the drug, but that number is

fairly small (less than 20%). However, the side-effects may begin as late as six months after the beginning of treatment and can include vomiting, lethargy, anorexia, fever, and anemia. Methimazole blocks the production of excess thyroid hormone rather than destroying the abnormal thyroid tissue. Therefore, the drug must be given for the remainder of the cat's life. Periodic blood tests must be done to keep the dosage regulated and to ensure that no adverse side-effects are developing. Blood tests are usually performed every three to six months for cats receiving methimazole. This type of treatment is appropriate for the cat that is a poor surgical risk due to other health problems or is exceptionally old. As stated above, it may also be used for a few weeks to stabilize the cat that is at increased surgical risk because of cardiac complications.



Recurrence of the disease is a possibility in some cats. It is uncommon after radioactive iodine therapy. When surgery is done, recurrence is possible if abnormal thyroid cells are left in the cat. The remaining cells will likely grow causing the disease to recur. However, this occurs less than 5% of the time and usually two to four years after surgery. Another possibility for disease recurrence is that one lobe of the thyroid gland was normal at the time of surgery so it was not removed. Then, months or years later, it becomes abnormal.

#### ***What is the prognosis for hyperthyroidism?***

Many owners of cats with hyperthyroidism are hesitant to have radiation therapy or surgery because of their cat's advanced age. But remember, age is not a disease. The outcomes following both surgery and radiation therapy are usually excellent, and most cats have a very good chance of returning to a normal state of health. Cats managed medically also often do very well as long as the medication is administered routinely and follow-up blood and diagnostic test schedules are performed.

#### ***Can hyperthyroidism be prevented?***

There are no preventive measures for hyperthyroidism, but middle-aged and senior cats should receive a complete physical examination by a veterinarian every six to twelve months. Special attention should be given to thyroid enlargement and the typical clinical signs of hyperthyroidism. Annual blood and urine tests are important in all cats over age six to detect hyperthyroidism before potentially irreversible damage occurs.