

# Hyperthyroidism in Cats

The thyroid gland is located in the neck and plays a very important role in regulating the body's rate of metabolism. 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 nonmalignant change (benign). Less than 2% of hyperthyroid cases are due to cancer.

Many organs are affected by this disease, 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 80% of cats with hyperthyroidism have high blood pressure and a rapid heart rate.

## ➤ Contributing Factors

Advancing age is the main factor that increases a cat's risk for hyperthyroidism. Environmental and dietary risk factors have been investigated and may play a role in predisposing cats to hyperthyroidism, though the specific mechanisms are not known.

No individual breed is known to be at increased risk, although the Siamese appears to have a 10-fold lower risk of developing hyperthyroidism than other breeds.

## ➤ Clinical Signs

The typical cat with hyperthyroidism is middle-aged or older; on the average, affected cats are about 12 years of age. The most consistent finding with this disorder is a loss of weight 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 gradually lose weight. The weight loss may be so gradual that some owners will not even realize it has occurred. Affected

cats often drink a lot of water and urinate a lot. There may be periodic soft stool or diarrhea, and the hair coat may be 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 a 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 sudden blindness. The heart problems develop because the heart must enlarge and thicken to meet the increased metabolic demands. Hypertension and thyrotoxic cardiomyopathy are reversible with appropriate treatment of hyperthyroidism.

➤ **Causes**

A specific cause has not been identified. The possible role of dietary iodine continues to be investigated as a dietary influence on development of hyperthyroidism.

➤ **Diagnosis**

In most instances, diagnosis of this disease is relatively straightforward. One of the first things to happen is an increase in size of one or both thyroid lobes. If they can be palpated (felt) during the physical exam, they are considered abnormal. The first blood test that is performed measures the level of one of the thyroid hormones, called thyroxine (or T4). Usually, the T4 level is so high that there is no question as to the diagnosis. Occasionally, a cat suspected of having hyperthyroidism will have T4 levels within the upper range of normal cats. When this occurs, a second test, called a T3 Suppression Test, is performed. If this is not diagnostic, a thyroid scan can be performed at a veterinary referral center or the T4 could be measured again in a few weeks.

➤ **Treatment Options**

Because less than 2% of these cats have cancerous growths of the thyroid gland, treatment is usually very successful. Since this largely is a disease of geriatric cats, cats of advanced age are candidates for successful treatment.

There are four choices for treatment. Many factors must come into consideration when choosing the best therapy for an individual cat.

1. Felimazole™ or Tapazole™.\* Administering this drug can control the effects of the overactive thyroid gland on a long-term basis because it keeps the thyroid tumor from producing too much thyroid hormone. 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. Felimazole is an enteric (hard) coated tablet that is less likely to cause stomach irritation than Tapazole or generic methimazole. The drug does not destroy the abnormal thyroid tissue, but rather stops the production of the excess hormone. 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. This treatment is appropriate for the cat that is a poor surgical risk due to other health problems. It is the least expensive form of treatment in the short-term; however, it can be the most expensive form if your cat remains on treatment for several years.
2. Diet. A very low iodine diet (y/d® by Hill's) has been shown to reduce the thyroid hormone level in hyperthyroid cats.\* It usually takes about 3 weeks to achieve this. It must be fed exclusively (no other cat food, no dog food, no table food) or it will not work. Due to involved manufacturing requirements this is an expensive diet so its long-term use to keep hyperthyroidism in check can get costly. Like every cat food ever made, not all cats will eat it.
3. Surgery. Surgical removal of the affected thyroid lobe(s) is also very effective. Because hyperthyroid cats are usually over 10 years of age, there is a degree of risk involved. However, if the cat is otherwise healthy, the risk need not be considered significant. If the disease involves both lobes of the thyroid gland, two surgeries will be required. In many cats, only one thyroid lobe is abnormal, so only one surgery is needed. The cat is generally hospitalized for one night following surgery and returns home feeling quite well. It should eat normally after returning home.

Most cat owners are very concerned about an elderly cat having surgery. In reality, surgery and anesthesia always carry some risk, whether it is on a cat or a human, young or old. However, if the cat is stabilized prior to surgery with Felimazole or Tapazole, the risk is minimal. In addition, the use of new anesthetics makes surgery much less risky.

The most significant complication of surgery is damage to the parathyroid glands. They are located on the surface of the thyroid gland and are responsible for maintaining the body's calcium level in the blood. Various surgical techniques have been devised to protect the parathyroid glands.

If both lobes of the thyroid gland are removed, surprisingly, only rarely does the cat become hypothyroid and require thyroid replacement hormone. This occurs because the cat has a very effective backup system consisting of many scattered clusters of thyroid cells in the neck. They are inactive in the cat with a normal thyroid gland; however, if both lobes of the thyroid are removed, these sleeping cells are awakened and stimulated to produce the needed amount of thyroid hormone for the cat. This compensation occurs about 98% of the time.

4. Radioactive iodine. Radioactive iodine, called  $I^{131}$  or radioiodine, is a very effective way to destroy abnormal thyroid tissue. It causes no damage to normal thyroid tissue or to the parathyroid glands. An injection of the drug is given in a veterinary hospital licensed by the State to administer radiation therapy. Destruction of the abnormal tissue begins immediately and takes several weeks to be completed. The cat must be hospitalized for about 3 to 7 days while radiation in the cat falls to a safe level. Visitation by owners is not permitted according to State law. Some restrictions must also be met for another week after the cat returns home. Cats receiving radiation therapy should be off Felimazole or Tapazole for about 4 days prior to treatment.

**\*Important note: A recent study shows that the incidence of thyroid cancer vs. thyroid benign tumors goes from 2% to 20% in cats maintained on methimazole for 4 years or**

**more. It appears that a benign tumor will transform to a malignant one over time. This is causing us to relook at the use of methimazole as a good long term treatment choice. The same result is likely to occur with cats maintained long-term on the diet y/d.**

➤ **Recurrence**

Recurrence of the disease is a possibility in some cats. Recurrence is uncommon after radioactive iodine therapy, but it can happen. When surgery is done, it is also uncommon, but not impossible. If a few of the abnormal thyroid cells are not removed, they can multiply enough to recreate the disease in 2-4 years. However, this occurs less than 10% of the time; the skill of the surgeon is a factor in this. Another possibility is that one side of the thyroid gland was normal at the time of surgery or radiation therapy so it was not removed or treated. Then, months or years later, it may become abnormal causing a return of hyperthyroidism.

➤ **Prognosis**

Many owners of cats with hyperthyroidism are hesitant to have radiation therapy or surgery because of their cat's advanced age. However, the outcome following both surgery and radiation therapy is usually very positive, and most cats have a very good chance of returning to an excellent state of health for many years. The greatest advantage of these approaches is that the disease is actually cured and thyroid function returns to normal.

The prognosis for cats receiving long-term Felimazole or Tapazole therapy is also very good as long as side-effects do not develop and the cat receives its tablets continuously. The prognosis for cats eating y/d long-term is also good. However, feeding the diet exclusively is essential. Both approaches control the disease but do not cure it so long-term treatment is required.