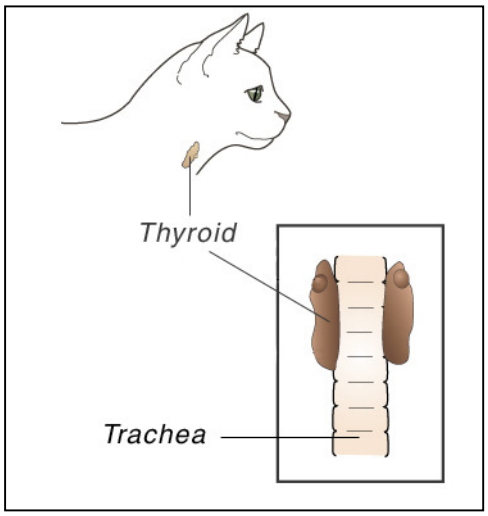
FELINE HYPERTHYROIDISM

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, and this condition is in fact the most common hormonal disease in cats. 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 symptoms of hyperthyroidism?

The typical cat with hyperthyroidism is middle aged or older. The average age of affected cats is approximately 12-13 years. The most common clinical sign of hyperthyroidism is weight loss secondary to the increased rate of metabolism. The cat often 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, they may seem hyperactive, and often become grumpier than usual. There may be periodic vomiting or diarrhea, and the fur may appear unkempt. In some cats, poor appetite, lethargy and weakness can develop 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?

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. Indoor cats are more likely to be hyperthyroid, as are cats who eat fish flavored canned cat foods.

How is hyperthyroidism diagnosed?

In most instances, diagnosis of this disease is relatively straightforward. The first step is to determine the blood level of the thyroid hormones. Usually, the thyroid hormone level is so high that there is no question as to the diagnosis. Occasionally, a cat suspected of having hyperthyroidism will have thyroid hormone levels within the upper range of normal. Hormone levels can fluctuate between normal and elevated early in the disease process. When this occurs, other blood tests may be performed. If these tests are not diagnostic, a thyroid scan can be performed at a veterinary referral center or the thyroid hormones can be measured again in a few weeks.

How is hyperthyroidism treated?

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, x-rays, EKG, and 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 normal thyroid tissue or other organs. Treatment requires one or two weeks of hospitalization at a veterinary hospital licensed to administer radiation therapy. After treatment the cat must be boarded in a special radiation safety ward until levels are low enough to be safely released to go home.

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 procedure usually goes well. If the disease involves both lobes of the thyroid gland, two surgeries may be required, depending on the surgeon's choice of procedures. In some 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 two nights following surgery. There will be monitoring of bloodwork in the days, weeks and months after surgery. Low calcium after surgery due to disruption of the parathyroid glands is something that we monitor for. If it happens, it is usually short lived. Very rarely, especially of both thyroid glands are removed on the same day, low calcium can be potentially life threatening. Another possible very rare complication of surgery might be damage to the recurrent laryngeal nerve that controls the voice and swallowing.

3. **Oral medication.** Administration of an oral drug methimazole (Tapazole®) twice daily 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%). If side effects occur, they usually happen within the first few weeks of treatment, but side effects may occasionally begin as late as six months after the beginning of treatment. Side effects to methimazole can include itching and swelling of the face, vomiting, lethargy, anorexia, fever, and low blood counts. 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. Once regulated, blood tests are usually performed once or twice a year. 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.

Will Hyperthyroidism Recur?

Recurrence of the disease is a possibility in some cats. It is uncommon after radioactive iodine therapy (less than 3-5%). 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 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. However, 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.

When an older cat has both kidney disease and hyperthyroidism, things become more complicated. One of the positive side effects of the hyperthyroid state is that the amount of blood pumped by the heart (cardiac output) is increased. Since the kidneys receive about 25% of the blood being pumped from the heart, this can increase blood supply to the kidneys

significantly. So when the hyperthyroidism is treated, blood supply to the kidneys is reduced back to normal, and chronically ill kidneys can have difficulty doing their job as well as when the body was in a hyperthyroid state. So, if your cat has both hyperthyroidism and chronic kidney failure, treating hyperthyroidism in a permanent way (radioactive iodine or surgery) can potentially cause more harm than good. In these cases, a trial of low dose methimazole is in order, to see how the kidneys tolerate a normal thyroid state. If thyroid levels can be brought to normal with methimazole, and the cat does well for several months, it might be possible to treat the hyperthyroidism with surgery or radioactive iodine. If kidney values elevate when methimazole is used, radioactive iodine and surgery are probably not a good option. In these cases, sometimes a low dose of methimazole can be used – just enough to minimize the hyperthyroidism as much as possible, but not enough to make the kidneys worse.

Tumors of the thyroid gland causing hyperthyroidism are usually benign. In the rare case of malignancy, surgery is not likely to be curative, and response to medications may not be as good as usual. However, cats with hyperthyroidism due to thyroid cancer can do very well after radioactive iodine treatment.

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.

References:
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