Feline Hyperthyroidism

Expert health and behavior advice from the feline care professionals at
Paws, Whiskers & Claws
The Feline Hospital
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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 non-malignant change (benign). Less than 2% of hyperthyroid cases involve malignant thyroid gland tumors.

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. Hyperthyroidism can also mask underlying other diseases such as chronic kidney disease (CKD).

What cats are more likely to become hyperthyroid?

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, though the specific mechanisms are not known. No individual breed is known to be especially at increased risk.

What are the clinical signs?

Cats afflicted with hyperthyroidism usually develop a variety of signs, which may be subtle at first but then become more severe as the disease progresses. The most common clinical signs of hyperthyroidism are weight loss, increased appetite, and increased thirst and urination. Cats may eat new or different types of food than they used to (ex. a cat that always ate dry food now wants to try wet food or people food!). Hyperthyroidism may also cause vomiting, diarrhea, and increased energy (excessive vocalizing, "busy", pacing). It's like they are having a caffeinated beverage every few hours. The coat may appear matted or greasy; they may also overgroom because they feel jittery from the excess thyroid hormone. If a cat previously had constipation issues, the bowel movements may now be normal.

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 blindness occurs as a result of retinal hemorrhage or detachment. Heart problems develop because the heart must enlarge and thicken to meet the increased blood flow and metabolic demands. Both of these problems can be reversible with appropriate treatment of the disease.

Hyperthyroid cats, just like people with this or any other disease/illness, may act in ways we would refer to as cranky, easily agitated, or aggressive towards people, especially children, and/or other animals. Pain or discomfort from any source/cause often triggers cats to act out of their ordinary routine. They may hide, be less social, have different eating habits as described above, and/or different elimination habits which often means not using their litterbox to urinate and/or defecate. Sick or painful cats are not being spiteful or acting out of anger, just out of distress. It is their natural instinct to behave this way. In the wild, a sick cat is a weak cat and a weak cat is a potential victim. Changing their normal routine and/or demeanor may ward off a potential predator. So you see, what seems abnormal to the untrained human eye is actually normal to the feline survival instinct.

How is it 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 thyroxine (or T_4). Usually, the T_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 cats. When this occurs, other tests, called a Free T_4 (FT_4) or TSH (thyroid-stimulating hormone), may be performed. These blood tests evaluates thyroid function in a different manner. If this is not diagnostic, a thyroid scan can be performed at a veterinary referral center or the thyroid tests can be measured again in a few weeks.

What are my options for treatment?

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

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 chemistry profile, complete blood count (CBC), and urinalysis. Sometimes blood pressure and/or cardiac ultrasound may be recommended.

The three treatment options for hyperthyroidism are:

1. Oral medication. Administration of an oral drug, methimazole, can control the effects of the overactive thyroid gland. Rarely, some cats have reactions to the drug, but that number is small. However, the side-effects may begin as late as six months after the beginning of treatment and can include vomiting, lethargy, anorexia, fever, facial/head itching, and anemia.

Methimazole does not destroy the abnormal thyroid tissue but rather prevents the production of excess thyroid 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 and monitor for side effects. Initially, bloodwork such as a T4 (thyroid level) +/- other thyroid function tests (a FT4 +/- a TSH), CBC, and the kidneys should be checked 2-6 weeks (the doctor will dictate when) after starting daily medication as well as after any time the dose of medication is changed.

After the thyroid level is normal, the kidney values can increase. The hyperthyroid condition can mask underlying kidney disease. For this reason we recommend a trial with oral medication first, before RI^{131}. If kidney disease becomes apparent, it is easier to manage both diseases with oral thyroid medication than with surgery or RI^{131}. Once the thyroid level is stable, rechecks will be every six months.

The pill is very small, inexpensive, and has minimal to no taste. It is commercially available at all human pharmacies as well as our office. It also comes in a dissolving tablet called a "mini melt" that is easy to pill directly or dissolve in a small amount of special food. Cats require once to twice daily dosing and this can change spontaneously over the course of the cat's life, especially because there is usually growth of the benign thyroid gland over time. That is why it is so important to monitor your cat's weight and bloodwork regularly as determined by your vet. For those who find liquid medications easier to administer, either directly to their cat or mixed with a small amount of special food, the pill can be made into a variety of flavored liquids at an outside compounding pharmacy. It is also available in a new feline liquid called Felanorm that has a flavor most cats like. Finally, the medication can also be made into a transdermal gel at an outside pharmacy. The gel is applied to the non-haired inside portion of the cat's inner ear.

Oral medication is by far the most common treatment. Surgery is just about obsolete now that we have other safer and easier options. Recurrence of the disease is a possibility in some cats when surgery is done, 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 2-4 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.

2. Radioactive iodine (RI^{131}). A very effective way to treat hyperthyroidism is with radioactive iodine therapy. It is given by a subcutaneous injection, exactly like a vaccine is, and destroys all abnormal thyroid tissue without endangering other organs. This essentially cures the disease. However, a very small percentage of cats can regrow abnormal thyroid tissue, but this is very rare. If this occurs, retreatment is necessary. Treatment requires an average stay of 2-4 days at a veterinary hospital licensed to administer the therapy. Sometimes, but not always, the expense can be greater than for the other options. This option may make more economical sense if you have a younger cat diagnosed with this disease. We see cats living into their early 20's (average 16 years old). A 10 year old cat needing daily medicine and at least biannual blood rechecks for this disease (see below) for 10 years could cost about the same. Every once in a

while a cat can become hypOthryoid after this treatment (or the next one) and still end up needing daily medication.

3. 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. There is also potential for secondary post surgical complications. 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. The cost is approximately the same as RI^{131} treatment. Therefore surgery is only necessary for malignant tumors which are extremely rare.

If surgery or RI^{131} is the treatment method chosen, the cat is usually treated with an anti-thyroid medication for several weeks prior to the procedure. 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. After one to two weeks, another T_4 level is measured.

With surgery, there is also a risk of damaging the parathyroid glands which sit near the thyroid gland. This is particularly of importance if both thyroid glands are removed. The parathyroid gland controls calcium levels; if it is damaged or removed, low calcium can occur which can lead to seizures or heart arrhythmias. Calcium supplementation is necessary if this occurs.

Is the prognosis good?

The outcomes following consistent medication are excellent, most cats have a very good chance of returning to a normal state of health. Of all the common disorders we see in older cats, this is the "good" one to get. Cats can live many, many years with this disease which is easily managed with one of the above treatment options. It gets complicated when they have other medical issues that were masked by the hyperthyroid state. The more we can do to manage other issues that surface as the thyroid normalizes, the better the prognosis.

It is important to note that once a cat is treated for hyperthyroidism and we slow the thyroid levels back to normal, *they act their age.* Cats with untreated hyperthyroidism have been acting great, often like a young cat again, but this has been a façade. Once we start treatment and normalize the thyroid level, cats will sleep more, eat less, potentially play less, and may gain weight. The older and more medical problems they have, the harder it is for them to gain weight.

With untreated hyperthyroidism, the high thyroid level suppresses the kidney levels so their kidney disease is missed or doesn't look as bad as it truly is. When we treat hyperthyroidism, we often unmask kidney disease and needed to start therapies for chronic kidney disease, which is very common in older cats. We can also see more problems with arthritis because now these cats are slowing down and acting their age, leading to us seeing more arthritis symptoms. The arthritis and kidney disease were there all along, but masked by the over active hyperthyroid state. If a cat was previously constipated, we may see constipation

issues recurring. These are all manageable issues and we can help make managing them positive for you and your cat.

Can it be prevented?

There are no preventive measures to adopt, but middle-aged and geriatric cats should all receive a complete physical examination by a veterinarian every 6-12 months. Special attention should be given to thyroid enlargement and the typical clinical signs of hyperthyroidism. Annual senior bloodwork that includes a T4 can screen for this and other diseases so that we can catch them before they make cats feel badly, lose weight, stop eating, etc.