

Hyperthyroidism in Cats

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What is hyperthyroidism?

The thyroid is a two-lobed gland located in the neck of people, dogs, cats, and other animals. One lobe is on each side of the trachea (windpipe). The thyroid produces thyroid hormone, a substance that is transported via the blood to all cells in the body. The primary function of thyroid hormone is control of the rate that cells function:

- Too little thyroid hormone causes cells to work too slowly. Low thyroid function (**hypothyroidism**) is relatively common in dogs and quite rare in cats.
- Too much thyroid hormone makes cells work too fast. Excess thyroid function (**hyperthyroidism**) is rare in dogs but is one of the more common diseases diagnosed in cats that are 8 years of age or older.

It is not known exactly why cats develop hyperthyroidism:

- About 15% of hyperthyroid cats have a single thyroid tumor in one of the two lobes, called an *adenoma* (not a cancerous tumor) that produces too much thyroid hormone.
- About 80% of hyperthyroid cats have abnormalities in both thyroid lobes with both lobes producing excess thyroid hormone. These cats also have a benign (noncancerous) condition called *adenomatous hyperplasia*.
- Only about 3% of hyperthyroid cats have a malignant (cancerous) thyroid tumor.

Regardless of the description that a pathologist may provide regarding the thyroid from a cat with this condition, the final common denominator for each cat is the excess in thyroid hormone in the system that usually affects virtually every cell and every organ in the body. The organ systems that become overactive as a result of this exposure cause symptoms to vary somewhat from cat to cat. In general, hyperthyroid cats typically have their condition for some time (usually months) before an owner observes worrisome symptoms.

What are the symptoms of hyperthyroidism?

Each cat responds to his or her hyperthyroidism a little differently, causing observed abnormalities to vary from cat to cat. Among the most common owner observations are the following:

- Weight loss
- Increase in appetite
- Patchy hair loss or failure to groom (some cats have been observed to pull their hair out)
- Increase in water intake
- Increase in urine output
- Increase in activity level (some cats are persistently restless or nervous)

Some hyperthyroid cats have a change in behavior and when this happens, they tend to become irritable, mean, or easily upset. Vomiting and diarrhea are a little less common. Some hyperthyroid cats have unusually bulky stools and others have unusually large amounts of stool. Relatively uncommon but well-documented problems caused by hyperthyroidism include panting (open mouth breathing), difficulty breathing, loss of appetite, muscle weakness, listlessness, and seeking cool places.

What tests are needed?

The diagnosis of hyperthyroidism, regardless of the underlying changes within the thyroid gland itself, is relatively easy in most cats. Most hyperthyroid cats have too much thyroid hormone (thyroxine, or T4) in their blood all the time. This can be confirmed with a simple and relatively inexpensive blood test measuring T4. A small percentage of hyperthyroid cats do not have a "diagnostic" blood T4 concentration and, in this situation, your veterinarian may wish to repeat the test a few days, weeks, or months later.

Your veterinarian may elect to use a different thyroid blood test (called the "free T4 test") or their recommendation may be to have a thyroid *scan* performed on your cat. All these options are excellent and each one tends to complement the others. Virtually any veterinary can run the T4 and free T4 tests. Thyroid scans, however, require special facilities and usually require referral to a hospital with this equipment. Regardless, if your veterinarian believes your cat has this condition, the diagnosis is usually straightforward and relatively inexpensive.

Because hyperthyroid cats tend to be older, because they tend to have worrisome symptoms consistent with various non-thyroid-related diseases, and knowing that excesses in thyroid hormone can have deleterious effects on various organ systems, your veterinarian will likely recommend tests in addition to those which identify the thyroid status of your pet.

Some of these additional tests may include the following:

- CBC (complete blood count), to assess the red and white blood cells
- Chemistry panel and UA (urinalysis), to assess the function of various organs
- X-rays of the chest, to rule out congestive heart failure (a possible complication of hyperthyroidism) and other thoracic problems (not associated with the disease)
- X-rays or ultrasonography of the abdomen, to assess the various abdominal organs.

What treatment is needed?

Treatment, no treatment, and your cat's kidneys. Hyperthyroid cats that are not treated usually become progressively more ill. They tend to be quite thin, weak, and are likely to develop life-threatening problems. If your cat is not symptomatic, there should be no rush to treatment. In contrast, delaying treatment for symptomatic cats is unreasonable. Three commonly used treatments are available for managing hyperthyroidism in cats. Each treatment has the potential to provide excellent results and each has both advantages and disadvantages. Your veterinarian will explain the choices to you and help you decide which option may be best for you and your cat. Treating your cat will usually either return it to a reasonable state of good health or permanently cure the cat of this disease.

One fascinating aspect of treating hyperthyroidism in cats is that resolution of this condition is almost always associated with reduction of the blood supply to kidneys. In most cats, this is not worrisome. However, reducing the blood supply to the kidneys of some cats leads to compromise of their kidney functions, which is more worrisome and dangerous than hyperthyroidism. Therefore, if kidney disease is suspected in your untreated cat or if your veterinarian has other reasons to be cautious, trial therapy with methimazole may be recommended prior to using a more permanent form of treatment.

Methimazole. Methimazole is an oral (pill) medication that works by blocking the production of thyroid hormone. The effects of this drug are completely reversible. If you stop giving this drug, most cats quickly return to the same thyroid condition they had prior to using the medication. Thus if correcting the hyperthyroidism causes kidney results to become worrisome, then the medication can be discontinued or tailored to a dose that may not completely resolve the hyperthyroidism but also may not harm the kidneys. The drug is readily available and not terribly expensive. The major attribute of this drug is its ability to consistently decrease thyroid function. It is effective in virtually every cat. The drug usually works best when given twice daily.

Because this medication has potential side effects, starting out with an extremely low dose and slowly increasing the dose to effect is safest and most effective. Some veterinarians start with 2.5 once daily for 2 weeks, a dose that is too low to resolve the hyperthyroidism but one that rarely causes side effects. However, just getting a little drug into cats tends to minimize side effects as the dose is increased to achieve desired blood test and clinical responses. Therefore, as needed, they increase first to 2.5 mg twice daily for two weeks, check the blood, and then increase by 2.5 mg per day at 2-week intervals.

The major negative aspect of methimazole is that some cats are not the best pill takers. Rather than fight these cats, methimazole can be "compounded" by some pharmacists into a topical cream. The owner then uses a latex glove or finger cover, places the correct dose on his or her finger, and rubs the medication (usually in a tiny amount of cream) into the inner aspect of one ear. The medication needs to be rubbed in well (usually for 30 to 120 seconds) and then about 20 minutes later any excess cream (if there is any left) should be cleaned away with cotton and warm water.

Medication compounded by a good pharmacist is at least as good; frequently more effective in this route than it is when given orally. Because it is sometimes more effective, some veterinarians use a lower dose to start: usually 1 or 2 mg once daily and then increased as needed.

Other negatives about methimazole, especially when given orally, are that it causes some cats to lose their appetites or vomit. These side effects are much less common in cats given topical rather than oral medication. Even less common, but more worrisome, side effects include liver damage and decreases in red blood cells, white blood cells, and platelets. Platelets help blood to clot so loss of platelets can cause bleeding, whereas loss of white blood cells predisposes these cats to infection, and loss of red cells is anemia that can make a cat weak or die. Rarely, treated cats develop a type of reaction and they begin to scratch their faces uncontrollably.

Although many of these side effects are alarming, they are not common. Therefore this drug is given to virtually every hyperthyroid cat. It is either their only means of treatment or it is given to test the effects of resolving the increased thyroid hormone concentrations on kidney function prior to using a permanent form of therapy.

Surgery. Surgery can be used to remove the abnormal thyroid lobe or lobes. The benefits to this surgery include the following:

- It is not difficult
- It does not require fancy equipment
- Is not terribly expensive
- It has the potential to resolve the hyperthyroidism quickly and permanently

Most veterinarians either do this surgery or can refer you to a colleague who does it. The negatives associated with this surgery are that it does require anesthesia. Because many hyperthyroid cats are older and afflicted with other problems that could complicate surgery, this treatment is not always an option. However, the anesthesia is relatively brief and it is an extremely effective means of managing this condition.

Radioactive iodine. The third treatment option is the use of radioactive iodine. Iodine is one of the primary ingredients of thyroid hormone. Iodine that is radioactive is trapped and taken up by the thyroid lobes just like any other iodine. However, the radioactivity in this medical-iodine destroys surrounding thyroid cells and can permanently resolve hyperthyroidism.

The benefits of this treatment include the following:

- It is an extremely effective form of treatment
- It resolves hyperthyroidism quickly

- It requires no anesthesia
- No pills are necessary
- Like surgery or methimazole, it almost never causes *hypothyroidism*

The negative aspects of this form of treatment are that sophisticated facilities licensed for use of radioactive materials are required. Although this treatment is not available everywhere, it is available in numerous sites throughout the United States and more treatment centers continue to open. It tends to be more expensive than surgery annually, in part because treated cats must remain hospitalized until their body levels of radioactivity are safe. This allows all urine and stool (which contain radioactivity) to be properly disposed. Hospitalization usually ranges from several days to as long as 2 weeks.