

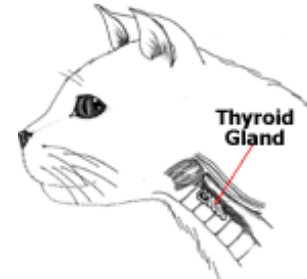
Hyperthyroidism in Cats

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Hyperthyroidism is the most common endocrine (hormone) disorder that affects cats. It creates a wide range of signs resulting from the overproduction of thyroid hormone made by the thyroid gland.

What is the thyroid gland?

The thyroid gland is small and consists of two lobes, one on each side of the trachea (windpipe) in the neck. This gland produces the major thyroid hormone called thyroxine (T4) and a small amount of another hormone, triiodothyronine (T3). These hormones regulate the body's metabolic rate and affect every system in the body. The production of the thyroid hormones is controlled by the hormone called thyroid stimulating hormone (TSH). TSH is produced by the pituitary gland, which is found at the base of the brain.



What causes hyperthyroidism?

If the thyroid gland produces excess amounts of the thyroid hormones, the condition called hyperthyroidism results. The most common cause is a benign (non-cancerous) increase in the number of cells in the thyroid gland. Groups of these abnormal cells form small nodules on the thyroid gland and are termed adenomas. Multiple adenomas may form in the same lobe, and in approximately 70% of the cases, both lobes are involved. Only 1-2% of hyperthyroid conditions in cats are caused by malignancy (cancer).

The incidence of hyperthyroidism in cats has increased remarkably in the last 25 years. The reason for this is unknown, but probably due to multiple factors. The ingredients and types of foods fed, immunological factors, and environmental influences may be involved.

Which cats are most likely to become hyperthyroid?

Hyperthyroidism occurs most commonly in middle to old-age cats with a reported range of onset between 4 and 22 years. The median age for acquiring the disorder is just under 13 years. Only 5% of hyperthyroid cats develop the disease before 8 years of age. There does not appear to be a breed or sex predilection.

What are the signs of hyperthyroidism?

The signs are wide and variable. The chart below lists the most common signs along with the incidence with which they are seen.

Signs Commonly Observed by Owners of Cats with Hyperthyroidism	
Sign	% of Cats with Sign
Weight loss	90%
Increased food consumption	53%
Vomiting	44%
Increased water consumption/ urination	40%
Increased activity, behavior changes, nervousness	34%
Unkempt haircoat/hair loss	30%
Diarrhea	20%
Tremors	15%

Weakness	13%
Panting or labored breathing	12%
Decreased activity	12%
Loss of appetite	7%

Rapid heart rates are common in cats with hyperthyroidism, and heart murmurs and high blood pressure can also occur. Cats with hyperthyroidism that are not treated often develop a heart condition called hypertrophic cardiomyopathy, in which the muscle of the heart becomes excessively thick. This can lead to heart failure and death.

How is feline hyperthyroidism diagnosed?

There are three main criteria for diagnosing hyperthyroidism:

1. Clinical signs as described above
2. Palpation of an enlarged thyroid gland - Normally, the thyroid gland in cats cannot be palpated. In most cats with hyperthyroidism, the gland becomes large enough to feel. Sometimes the gland becomes so large, it actually migrates or "sinks" into the chest cavity, and cannot be felt. There may also be instances where thyroid gland tissue is found in other areas of the neck and chest. This is called ectopic thyroid tissue.
3. Increased thyroid hormone levels - High T4 levels indicates hyperthyroidism in cats. Elevated T3 levels also indicate hyperthyroidism, however, in 25% of the hyperthyroid cats T3 is not elevated even though T4 is high. For this reason, the blood level of T4 is primarily used to diagnose hyperthyroidism. Sometimes, an animal with concurrent kidney, heart, or other debilitating disease may have hyperthyroidism but a normal or only slightly elevated T4. If an animal is suspected of having hyperthyroidism but has a normal blood test it is suggested that the animal be re-tested after the current disease is under proper medical management.

Since many of the signs of hyperthyroidism can also be found in other diseases such as diabetes mellitus, kidney failure, heart disease, or liver disease, other laboratory tests such as a [CBC](#), [serum chemistry](#), and [urinalysis](#) are generally performed to determine if these diseases are present. The test results will also influence which type of treatment would be most appropriate. Cats with hyperthyroidism may have slight increases in the number of red blood cells, increased liver enzymes, and increased BUN and creatinine, which measure kidney function.

Occasionally, veterinarians will use other tests to confirm their diagnosis of hyperthyroidism. These include the T3 suppression test, thyrotropin-releasing hormone stimulation test, measurement of free T4, and thyroid radionuclide uptake and imaging.

How is feline hyperthyroidism treated?

There are currently three ways to treat hyperthyroidism in cats:

1. Medical treatment with the anti-thyroid drug, methimazole
2. Surgical removal of the affected gland
3. Treatment with radioactive iodine

All of these treatments have their advantages and disadvantages and some are better than others for different age and disease presentations.

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Comparison of Treatments for Hyperthyroidism in Cats		
Treatment	Advantages	Disadvantages
Methimazole	Medication readily available Inexpensive in short-term No anesthesia or surgery No hospitalization or special facilities required Treatment is reversible, if needed Development of	Not a cure; the adenoma will continue to grow Lifelong therapy necessary Medication may need to

	<p>Development of hypothyroidism very rare Preferred in cats with kidney failure or other serious disease Used prior to radiation or surgery to stabilize cat</p>	<p>May need to be given more than once daily May be difficult to give medication Medication occasionally has side effects some cats cannot tolerate Periodic blood work required</p>
Surgery	<p>Cures the condition unless all of the abnormal tissue is not removed Approximately the same cost as several years of methimazole Short hospitalization No need for daily medication</p>	<p>Requires anesthesia Cat must be a good surgical candidate Post-operative complications can occur to parathyroid gland or nerves in the area Could rarely cause hypothyroidism Not possible if thyroid tissue is located within the chest May need to be repeated</p>
Radioactive Iodine Treatment	<p>No anesthesia, sedation, or surgery All abnormal tissue is treated No need for daily medication Does not destroy healthy tissue or other organs</p>	<p>Availability limited Most expensive alternative: over \$1,000 Specialized facility</p>

	<p>Normal thyroid function returns within a month</p> <p>Preferred if malignancy present, or thyroid tissue located within the chest</p>	<p>required</p> <p>Hospitalization and quarantine required</p> <p>Treating other diseases during initial days following treatment is not possible</p> <p>In rare cases may need to be repeated</p> <p>Could rarely cause hypothyroidism</p>
<p>Chemical Ablation</p>	<p>Short anesthesia time</p> <p>Short hospitalization</p> <p>No need for daily medication</p> <p>Specialized facility not required</p>	<p>Requires anesthesia</p> <p>Post-operative complications can occur to nerves in the area</p> <p>Not possible if thyroid tissue is located within the chest</p> <p>Effects may be short-term, and procedure may need to be repeated multiple times</p> <p>Still considered experimental, and is not widely available at this time</p>

Antithyroid Medication: The use of oral antithyroid medication is still a very popular choice for the treatment of hyperthyroidism in the cat. The drug that is used is [methimazole \(Tapazole\)](#). Tapazole is a human drug. It is given in a pill form, daily for the life of the cat. It can also be administered as a transdermal gel applied to the ear. It works by blocking the synthesis of thyroid hormone in the gland.

One disadvantage of methimazole therapy is that it does not cure the disease. It can also be difficult to administer to some cats. Side effects of lethargy, vomiting, and scratching of the face occur in about 15% of cats that take methimazole. These side effects usually occur within the first 3 months of therapy and can often be reduced by starting the cat on a low dose, and gradually increasing the dose over several weeks. Rarely, severe liver toxicity can occur. Blood tests are generally performed every 3-6 months during the lifetime of the animal.

Some advantages to this product are that it does not cause the loss of function of the parathyroid gland that often occurs with surgery. The cost of the pill is relatively inexpensive. If complications or problems develop it can be discontinued. It rarely causes hypothyroidism.

Methimazole is often used as a first course of therapy for hyperthyroidism. This can help reverse some of the abnormal metabolic and heart conditions associated with hyperthyroidism. This will decrease the anesthetic risk if surgery will be performed. This also allows for better assessment of the kidney function. Hyperthyroidism may mask kidney disease, and the kidney disease may worsen following treatment of the hyperthyroidism. Because it is not easy to determine what impact the hyperthyroid state is having on kidney function, treating with a reversible therapy (i.e., methimazole) is often preferred until the impact of hyperthyroidism on kidney function can be determined. If kidney function remains the same or improves following treatment of the hyperthyroidism with methimazole, a more permanent treatment for hyperthyroidism can be recommended.

Surgery: Surgery to remove the abnormal thyroid lobe is called thyroidectomy. Thyroidectomy is a common treatment unless the risk of anesthesia in the cat is unacceptable, the thyroid gland is extremely large, thyroid tissue is present in the chest cavity, or thyroid cancer with metastasis is suspected. If possible, an ultrasound examination of the thyroid gland and surrounding structures or a radionuclide thyroid scan are performed to identify the location of the abnormal thyroid tissue, determine if one or both lobes are involved, and provide insight into the ability to preserve the parathyroid glands during surgery.

Since the parathyroid glands are surrounded by thyroid tissue, it may be difficult to visualize them during surgery. The parathyroid glands control the calcium and phosphorous levels in the body. If the parathyroid glands are inadvertently removed during surgery, life-threatening hypocalcemia (low blood calcium levels) can occur. Blood tests to monitor calcium levels are generally performed at least once daily for 5 to 7 days if both lobes of the thyroid gland are removed. Clinical signs of hypocalcemia typically develop within 72 hours of surgery, although signs may not develop for 5 to 7 days.

Other post-surgical complications include laryngeal paralysis or [Horner's syndrome](#) resulting from injury to nerves during the surgery, hypothyroidism (the thyroid gland does not produce enough thyroid hormone), worsening of kidney disease, and failure to resolve the hyperthyroidism if thyroid tissue remains in the cat. Some veterinarians do not perform this surgery and a referral may be necessary.

An additional drawback of surgical treatment is the necessity for anesthesia. This is of special concern in elderly or frail animals, and cats with unresolved heart or kidney problems. Many cats however make excellent surgical candidates.

Surgery can be an effective cure for this disease. It eliminates the need for daily administration of medications and the animal only has to be hospitalized for several days.

Radioactive Iodine: Radioactive iodine therapy provides a simple, effective, and safe treatment for cats with hyperthyroidism. The majority of iodine an animal receives in the diet or through an injection becomes concentrated in the thyroid gland. When given radioactive iodine, the iodine becomes concentrated in the thyroid gland and kills the over-producing cells. The parathyroid glands are not damaged by this treatment.

A hyperthyroid cat usually receives the radioactive iodine by means of an injection. The cat will need to remain hospitalized following the injection since the cat has too much radioactivity to safely be at home. The radioactivity is checked daily and when it reaches an acceptable level, usually in 2-7 days, the cat may go home.

Some disadvantages to this treatment are that it can be expensive initially. Also, most veterinary clinics do not have the facilities to perform this procedure so it may be necessary to travel a long distance to find a treatment facility. In 1-2% of cases, especially those in which the hyperthyroidism is caused by cancer, two treatments may be necessary. Some cats may become hypothyroid following this treatment, but that can be treated relatively easily with thyroid hormone supplementation.

Because of the radioactive material used, the animal needs to stay at the clinic until it clears the material from his body, usually around a week. When the cat returns home, certain precautions will need to be followed for several weeks regarding the handling of the cats, the litter box, and contact with other pets.

This treatment may not be an acceptable choice for cats having medical problems requiring daily treatments. Since veterinary staff can only handle the cat briefly the first 2 days after treatment, providing treatment for other diseases (such as fluid therapy for a cat in kidney failure) may not be possible.

Radioiodine treatment is the preferred treatment for cats with both lobes of the thyroid gland affected, and those with thyroid tissue in inoperable locations. The results and safety of this therapy appear to be excellent.

Chemical Ablation: A new treatment, called "ablation" is being investigated. With this treatment, ultrasound is used to identify the thyroid gland, which is then injected with a chemical or exposed to heat via high radiofrequency to kill the abnormal cells. Although the procedure requires anesthesia, the treatment takes less than 15 minutes.

Summary

Hyperthyroidism is the most common endocrine disorder that affects cats. It usually strikes middle to older age cats and has a wide range of signs. Diagnosis is relatively easy with a blood thyroid level check. There are three different treatment options that include anti-thyroid medication, surgery, and radioiodine therapy. Treatment is usually successful and properly treated cats can lead normal healthy lives.