

Hyperthyroidism

What does the thyroid gland do, and what's wrong with it being overactive?

The thyroid gland produces thyroid hormone which regulates the metabolic rate – the rate of chemical reactions in every cell in the body. Hyperthyroidism increases the metabolic rate which means that calories will be burnt at a higher rate than usual which makes the cat eat more and lose weight. The increased metabolic rate also causes the heart to beat stronger and faster which, in the long run, will lead to heart enlargement and heart disease. The cause of hyperthyroidism in cats is uncertain, but there appear to be links to the presence of fish in the diet, feeding food from pop-top cans, and the presence of flame-retardant chemicals in the cat's environment, among other factors.

What are the symptoms of hyperthyroidism?

Hyperthyroidism mostly occurs in older cats, but it can happen as early as two to three years of age. The most common signs are unexpected weight loss and excessive appetite. Most cases also exhibit restlessness, agitation, and increased vocalization. A small percentage will be lethargic and eat poorly. Other possible signs include vomiting, diarrhea, excessive drinking or urination, poor hair coat, and rapid toenail growth. High blood pressure is not uncommon and if uncontrolled it can lead to blindness from detached retinas. Hyperthyroid cats may become heat and stress-intolerant, and may exhibit panting or excessive agitation under stress. Without treatment, the cat will likely develop progressive heart disease and congestive heart failure.

How is hyperthyroidism diagnosed and treated?

The diagnosis is based on symptoms, physical exam (which often reveals a palpably enlarged thyroid gland) and lab work, which also will determine if there are other concurrent conditions that can affect the treatment plan. Usually the initial thyroid hormone (T4) results are conclusive, but in some cases a second thyroid test called a free-T4 by Equilibrium Dialysis (fT4) is needed for confirmation. The treatment options include medication (Methimazole), radioactive iodine (I_{131}), and a reduced iodine diet called y/d. Surgical removal of the thyroid is not recommended because of the risks.

Methimazole:

Methimazole suppresses the production of thyroid hormone and is generally very effective at controlling the condition. It needs to be given once or twice daily for the rest of the patient's life, and the tablets are available from any Veterinarian or human pharmacy. Because of the difficulty of pilling cats, compounding pharmacies are often employed to make more cat-friendly forms of the drug including flavored chewable treats, flavored liquids, or a trans-dermal gel that's rubbed on the hairless skin inside the cat's ear flap. While the drug is usually well tolerated, there are occasional side effects, the most common of which are vomiting and poor appetite, usually during the first month of treatment. If these effects occur, they are usually mild and are managed by decreasing or temporarily discontinuing the medication. An uncommon side effect is itching of the head and face and self-trauma. We recheck blood work every two to four weeks at the beginning of treatment to evaluate effectiveness and to look for more serious, but uncommon side effects like liver disease and reductions in white and red blood cell numbers. Once thyroid levels are normalized, we usually only need to check blood work and an exam every three to six months.

Radioactive Iodine (I_{131}):

This treatment involves a single injection of radioactive iodine (I_{131}) under the skin. That iodine is absorbed into the blood stream and then concentrated into the overactive parts of the thyroid where it will give localized radiation treatment without radiation side effects. It is very rapid and extremely effective (95% + success rate). Follow-up lab work is performed at 1 and 3 months post-treatment, and the T4 level is usually below normal at one month and back into the normal range by three months. While I_{131} is expensive

initially, it can save money in the long run, and it also saves you from giving the meds, plus the trips to the Vet for rechecks and to the pharmacy for the Methimazole. Besides the up-front costs, the downside to I_{131} is transporting the cat to either Shoreline or Tacoma for treatment, where they must stay for two to four days, and litter storage afterwards. Because low levels of radiation continue to be excreted in the cat's urine, when the cat returns home the first two weeks worth of cat litter must be stored for two months before going into the trash. Also, you need to temporarily decrease the amount of time you spend in close contact with your cat. Occasionally, this treatment leads to low T4 (hypothyroidism), which may require life-long medication. Cats with concurrent kidney disease are not good candidates for radioactive iodine, so it is imperative to fully investigate kidney function prior to deciding about I_{131} .

The Feline Hyperthyroid Treatment Center says this about costs as of April 2019:

What is the total cost of the treatment?

The cost ranges from \$1345.00 to \$1745.00, depending on what dose the cat receives. Dr. Vaughan determines the dosage during her consultation with the cat and the owner.

Y/d diet:

Y/d has a much lower iodine content than any other cat food, which deprives the thyroid of the necessary iodine to make the thyroid hormone. This reduces the thyroid hormone to normal levels in most cases, but there are cases that are not effectively managed this way. For y/d to work, all other food and treats must be completely eliminated, because they will contribute so much iodine that it will completely negate the benefit of y/d. The convenience of using a food to treat hyperthyroidism may be outweighed by the expense of this food, which is considerable. Generally, in a multi-cat household, y/d is not a good choice. We would not recommend putting all cats in a multi-cat household on this diet due to the cost, and due to the unknown effects on the normal (non-hyperthyroid) cats.

Cats with both Hyperthyroidism and Chronic Kidney disease:

Hyperthyroidism causes an increase in blood flow throughout the body, including the kidneys, by causing the heart to beat faster and stronger. If a cat's kidneys are no longer adequately cleaning the blood, (as in Chronic Kidney Disease - CKD), they can actually clean the blood more effectively under the influence of improved blood flow because of the Hyperthyroidism. This effect can actually mask the presence of CKD in the blood work of hyperthyroid cats by reducing the BUN and creatinine. Initially, therefore a Urinalysis is necessary to tell if a hyperthyroid cat also has CKD. In treating cats with both conditions, it is important to not be too aggressive in treating the thyroid problem or it may be like pulling a crutch out from underneath the kidneys. We may want them to remain slightly hyperthyroid to help control the protein wastes in the blood stream. Therefore, I_{131} is generally not recommended for cats with hyperthyroid and CKD.

Methimazole and y/d are each acceptable options in lieu of I_{131} . Methimazole dosing can be fine-tuned to try to maintain a balance between the thyroid and kidney effects but it can take more adjusting than in other situations. Y/d is an acceptable diet option for CKD cats because it is formulated with less protein, making it similar to k/d and the Royal Canin Renal LP diets.

Cost comparison of Methimazole, Radioactive Iodine, and y/d

The cost on Methimazole treatment depends on several variables including the dose requirements, which vary widely between cats, the form of the drug used (pills are the least expensive but many cats will require a compounded form which costs more), the stability of the dose in a given case (it can fluctuate as time goes by) and the frequency of lab work required to manage the case. Between drug, lab and Veterinary costs it can run

\$400 - \$800 per year, maybe more. If this goes on for many years, the total can run into thousands of dollars. The cost of feeding y/d will depend on the size of the cat. For a 10# cat on dry y/d, the food itself for a year would be around \$300 - \$400. You'd have to subtract the cost of whatever food costs they would normally incur for the year to see the real cost of y/d. Supposing the cat normally eats \$100 - 150 of food in a year, then the real cost of y/d for a year would be \$200 - 300 above the normal feeding costs. In addition they could have another \$200 - 400 in potential Veterinary costs, although stable cases wouldn't need as much monitoring. So the cost of managing the condition with y/d is fairly similar to Methimazole. Radioactive Iodine runs about \$1350 to \$1750, plus two follow-up visits which are usually around \$100 each, for a total of around \$1550 to \$1950. There is some variation depending of exactly what lab work is needed to monitor the thyroid itself. This total is often less than the cost of having a cat on Methimazole or y/d for about two years.

What are the consequences of not treating hyperthyroidism?

Some cat owners maybe deceived into thinking that a hyperthyroid cat isn't really sick because they may be eating very well and may be very active. But untreated cats will usually continue to waste away no matter how much you feed them. They often develop heart disease leading to life threatening clots, congestive heart failure or death. They may also develop high blood pressure, which can itself lead to detached retinas and blindness, plus kidney and heart damage, and possibly strokes. Treatment of hyperthyroidism is usually very effective and often controls the secondary conditions. With treatment, most hyperthyroid cats will go on to live for many years with good quality of life, so we strongly recommend pursuing treatment for these cats.

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