

Radioactive Iodine Treatment

(For cats with Hyperthyroidism)

Internal Medicine Service



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What is Hyperthyroidism?

Hyperthyroidism is a condition that results from secretion of excess thyroid hormone. Hyperthyroid cats usually develop adenomatous hyperplasia or adenoma (benign tumor) of the thyroid gland. Thyroid carcinoma (malignant tumor) occurs rarely in cats.

Treatment

Hyperthyroidism can be treated medically or surgically. Medical treatment may consist of administration of methimazole (Tapazole) one to three times per day. Methimazole treatment will usually control hyperthyroidism but is not a cure (the drug blocks thyroid hormone secretion but will not destroy the thyroid tumor).

Furthermore the drug must be given for the rest of the cat's life. Surgery will likely cure the hyperthyroid condition and consists of the removal of part or all of the thyroid gland (the feline thyroid gland is defined by two separate lobes). Radioiodine (radioactive iodine) will also likely cure the hyperthyroid condition. The procedure for this treatment is relatively simple, consisting of a single dose of radioactive iodine.

Methimazole works well for some cats, but not all cats. Some cats develop mild reactions (e.g., loss of appetite, vomiting) while other cats develop serious adverse reactions to this medication (blood cell or liver problems). Blood tests are required to determine a patient's tolerance to methimazole: A CBC and serum chemistries tests are recommended after introducing methimazole. Finally, an owner may not want to have to medicate a relatively young cat for the rest of its life (pills must be given daily).

Surgery is generally an effective treatment for hyperthyroidism, but it can have disadvantages in some cats. Many cats with hyperthyroidism have heart problems and are higher anesthetic risks. There is also risk of damage to the adjacent parathyroid glands during thyroid surgery resulting in hypocalcemia (low blood calcium). Hypocalcemia can be life threatening and result in increased hospitalization and cost.

About radioiodine treatment

Iodine is an element required for normal health. In the body it is used primarily by the thyroid gland (located in the neck) to produce thyroid hormones.

Radioiodine (I-131) is a form of iodine that has been made radioactive. In its radioactive state it undergoes a natural process (decay) during which it gives off radiation. The radiation omitted consists of three types; alpha, beta, and gamma. The half-life of I-131 is eight days; in other words, one-half of the radioiodine goes through this decay process every eight days.

When taken into the body, a large percentage of radioiodine accumulates in the thyroid gland. The remainder of the I-131 is excreted in the urine and feces. Once the radioiodine is taken up by the thyroid gland (or thyroid tumor in a hyperthyroid cat), the gamma rays and beta particles are released. The beta particles travel a maximum of 2-5 mm in tissue. Therefore, beta-particles are locally destructive but spare adjacent hypoplastic thyroid tissue, parathyroid glands and other cervical structures. The radiation selectively destroys the thyroid tumor cells and thus treats the hyperthyroid condition.

The radioiodine is given as a single oral dose on the first day of hospitalization. After the treatment is administered, the patient is placed in isolation. The patient is monitored until its radioactivity level is low enough to permit release from the hospital, which is usually 5-7 days. By law, visitation is not permitted. During their stay, the cats are monitored daily by a licensed full time veterinary team. If you wish, you may call us to check on the status of your cat. It is routine for us to call each owner with daily progress reports.

* Periodic blood testing is indicated to ensure that the methimazole continues to be effective.



Radioactive Iodine Treatment Continued...

Side effects

Since the iodine is specific with respect to its site of action, there is no hair loss or increase in skin pigmentation as may be seen with other forms of radiation therapy. Some cats seem to experience mild discomfort of the thyroid region (thyroiditis) at the beginning of therapy, but this resolves spontaneously.

Occasionally a cat will develop hypothyroidism (underactive thyroid gland) after treatment with radioiodine. This is easily controlled with supplementation and may not be permanent. Overall, side effects are extremely rare.

Aftercare

Upon discharge the patient will still be minimally radioactive. Even though the level of radioactivity is very low (much lower than the level at which human patients are discharged from the hospital), caution should be exercised.

All of the remaining radioactivity will gradually disappear during the ensuing two to four weeks (through radioactive decay and excretion into the urine and feces). Until this is complete, the patient will emit low levels of radiation. Because of this, the patient should be kept isolated for at least two weeks at home.

Much of the residual radioactivity will be eliminated through the patient's urine and feces. Therefore we recommend that the litter box have a liner and scoopable, flushable litter. The litter box should be scooped daily and hands must be washed thoroughly afterwards.

The vast majority of cats require no specific aftercare. In rare instances it may be indicated for your veterinarian to perform a complete blood analysis two weeks after therapy. However in most cases it is recommended to recheck thyroid and renal (kidney) function six weeks and three months after therapy.

Prognosis

Studies have shown that a single dose of radioiodine is effective in curing hyperthyroidism in more than 97 percent of patients. Even cats that are not completely cured after one treatment will show a relative decrease in their circulating thyroid hormone concentrations and improve clinically.

In most cases if hyperthyroidism persists for longer than three to six months after initial treatment, re-treatment with radioiodine is generally recommended. In rare cases re-treatment with radioactive iodine may be recommended even sooner. Determination of the ideal time to retreat a patient is based on myriad factors. Most cats that remain hyperthyroid after the first treatment are generally cured by the second treatment.

It is very uncommon (less than 3% of cats treated) for hyperthyroidism to relapse. In addition, such recurrences usually develop three or more years after initial therapy. Therefore, the relapse may indicate the development of a new thyroid tumor rather than re-emergence of the first tumor that was treated with radioiodine.

Cost

The cost of any treatment for feline hyperthyroidism is significant. The cost for radioiodine therapy is generally a total fee of \$1,261, but may be more if the hyperthyroidism is severe. This includes the radioiodine itself, the cost of hospitalization, food, litter, and monitoring. Tests required before therapy are NOT included. The cost of methimazole would average \$400 to \$500 per year exclusive of the cost of monitoring blood tests.

Please note, because we must order the dose of radioiodine before the treatment is administered, cancellation of a scheduled appointment less than 3 working days before the appointment time will result in a charge of \$232. A non-refundable deposit of \$232 is required before the iodine is ordered.



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Preparing for treatment

The following tests are required before the appointment and should be done by your family veterinarian:

- CBC (Complete blood count)*
- Full chemistries*
- Total T4*
- Urinalysis*
- Two view thoracic radiographs

*Blood and urine analyses are required to be performed at a veterinary laboratory (not run in house). The ideal dose of radioactive iodine is gauged by the patient's pre-treatment T4. Furthermore, if the patient has been on Tapazole for a long time it is warranted to re-measure the patient's T4 two weeks after discontinuation of the Tapazole. The T4 at this time may be comparatively higher than the level of T4 documented at the time of diagnosis.

Day of treatment

Please bring your cat to the hospital at the scheduled time. You may feed your cat on the day of admission to the hospital (fasting is not necessary). Your veterinarian should have done all of the tests necessary before treatment. If your cat has been on methimazole (Tapazole), this drug should be discontinued for at least two weeks before treatment with radioiodine.

If your cat eats a particular kind of food, we suggest that you bring a few cans so that we can provide that diet while the patient is in the hospital. Personal items (a sock or toy) to place with the patient are not allowed because of contamination.

A full explanation of hyperthyroidism and I-131 treatment will be given by Dr. Elie on the day of admission. If all of the other routine diagnostics have been done by your veterinarian, we will treat your cat on that day.



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