



## **RADIOACTIVE IODINE THERAPY FOR HYPERTHYROID CATS INFORMATION FOR REFERRING VETERINARIANS**

Dr Amanda Gross has been licensed to treat Hyperthyroid Cats with radioactive Iodine since July 2007. She has had great success with the cats she has treated, currently having a 96% success rate. It is a very safe and effective means of treating affected cats especially in the early stages of the disease.

### ***How does the treatment work?***

The thyroid gland is unable to distinguish between stable and radioactive iodine. Radioactive iodine is given orally in the form of a capsule, which, once absorbed is selectively up taken and concentrated by functioning thyroid cells, which it then irradiates and destroys.

I-131 is the radioisotope used. It has a half-life of 8 days and emits both gamma and beta radiation. The beta radiation which causes 80% of the tissue damage, travel a maximum distance of 2mm. They are locally destructive but spare adjacent atrophied thyroid tissue and other cervical structures.

### ***Is my patient a suitable candidate?***

The treatment is permanent, and owners need to understand that there is a small risk that their cat will become either hypothyroid or remain hyperthyroid and require a second dose.

Although small, there is a real risk that cats treated with radioactive iodine can become **hypothyroid**. Cats that develop iatrogenic hypothyroidism need to be monitored carefully and treated with thyroxine replacement therapy, as it has been found that cats have a reduced survival time if left untreated due to the development or worsening of chronic renal disease due to reduced GFR. Cats do not tend to show obvious clinical signs like dogs, when they have hypothyroidism, so blood tests are needed for definitive diagnosis. It is common for cats to get a transient dip in TT4 at one month post treatment, but I would now recommend a **follow up 3-month and 6-month** assessment, post radiation, to reassess if this is a permanent state. It is best to do a **TT4 AND a cTSH as well as renal parameters**, as even cats with a TT4 in low normal range may have subclinical hypothyroidism. It is important owners understand this possible risk as many already struggle to tablet their cats, and this may mean lifelong treatment.

We get the best results when treating cats in the early phase of the disease and those that have a total T4 (TT4) of less than 100nmol/L and do not have any concurrent renal or cardiac disease. Increased chronicity of the disease increases the risk that the cat will need a second dose or that the early-stage hyperplastic thyroid cells or adenomatous cells may become malignant. Cats that have a TT4 greater than 150nmol/L may require a higher dose of radioactive iodine and therefore may require a longer stay in hospital. If the TT4 is greater than 200nmol/L, it would be pertinent to consider having scintigraphy and a fine needle aspirate of the thyroid tissue done, to assess malignancy. Malignant tumours can still be treated but require much higher doses of radiation (10x) and the chance of developing iatrogenic hypothyroidism increases.

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When considering if your patient is a suitable candidate for radioactive iodine therapy, it is important to firstly assess the cat's overall health. Clinical signs of hyperthyroidism can often mask renal disease. A **full blood profile** should be performed including **urine specific gravity and SDMA**, and a current **TT4**. It may be advantageous, although not always necessary, to do a clinical trial with either carbimazole or methimazole, for 4 weeks and repeat the above tests. This will not only unmask any renal problems but will also allow assessment of the cats' response to treatment, before embarking on a permanent treatment.

Cats that have concurrent chronic renal disease (CRD) **still need treatment for hyperthyroidism**. The increased GFR with elevated blood pressure will also lead to worsening of CRD. Studies done have indicated that generally hyperthyroid cats have similar survival time after they have become euthyroid, whether azotaemia is identified post treatment or not. So, potentially this can alleviate the requirement to do pre-treatment. These cats with CRD are not excluded from being treated with RAI, and I would highly recommend it, if cost is no concern or owners have difficulty medicating. Owners with cats that have severe CRD (IRIS stage 3 or 4), may choose just to control the hyperthyroidism with medication, which will rapidly return the cat to a euthyroid state.

Liver enzymes can increase as a normal side effect of hyperthyroidism and may be reversed once the cat is treated. However, markedly elevated liver enzymes or liver enzymes that do not return to normal level after pre-treatment with an oral anti-thyroid drug, should be thoroughly investigated prior to treatment with radioactive iodine.

It is also important to understand and advise the client, that although most cardiac changes that occur early in the course of the disease may resolve with treatment, cats that have developed congestive heart disease as a sequela of (normally) hypertrophic cardiomyopathy may not resolve and will require ongoing therapy for life. This is not to say, we wouldn't treat the cat, but good communication is essential to ensure the client understands the potential for future issues.

Other co-morbidities, such as Diabetes, need to be stabilised before RAIT. Surgical resolution from a skilled surgeon may prove to be a better option for these cats, as this will return the cat to a euthyroid state much more quickly and be a safer option in regard to radiation safety when handling the cat. Also, monitoring of the cat during hospitalisation would be more difficult.

More recent studies (R Oman et al, *Outcome of Radioactive Iodine Therapy in Cats Receiving Recent Methimazole Therapy* ACVIM 2011, Dept of Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO, USA), have indicated that a washout period of methimazole may not be necessary, as we once thought. However, as the treatment is quite expensive, it is currently still preferred to have the patient off any oral or transdermal treatment for at least one week, or 4 weeks in the case of Hills y/d, prior to radioactive iodine therapy, to ensure there is no inhibition to the therapy.

#### ***What is involved with the treatment?***

A specifically dosed capsule is ordered from Australian Nuclear Science & Technology Organisation (ANSTO) for each patient. Half of the cost of the treatment is paid by the client at time of ordering the capsule and is **NON-REFUNDABLE**.

The capsule is administered to a fasted patient, after a dose of maropitant and, if fractious, a mild sedative, to reduce the incidence of the cat vomiting or biting the capsule, both which are considered "radioactive spills". Once administered, the cat is isolated in a special hospital room for a period of a week at minimum, as the levels of radiation emitted by the cat and its waste are considered unsafe at these levels. We **do not allow visitation** during this time, for reasons of health and safety, but owners may contact us anytime to check on how the cat is doing. We will send your

clinic a follow up letter at the conclusion of the treatment. After the isolation period, the cat is sent home with special safety instructions for the owner to follow for another 2 weeks. A check up and follow up TT4 should be performed 4-6 weeks post treatment to ensure efficacy of the treatment and then again at 3 and 6 months in conjunction with a cTSH. This is done at the clients' regular veterinarian.

#### ***How do I refer a case?***

A history including all blood and urine tests done, from the time the cat is first diagnosed with hyperthyroidism, is required to be sent to [thehyperthyroidcatclinic@gmail.com](mailto:thehyperthyroidcatclinic@gmail.com), attention Dr Amanda Gross. Amanda will then call and discuss the treatment with the client, and if applicable, book a time for treatment.

Payment of the initial half of the treatment can be made over the phone by credit card or by EFT. This must be done at time of ordering the capsule usually 7 days prior to the treatment. The balance is paid on discharge of the cat from our clinic. The price covers all costs relating to their stay and treatment. Including the radioactive capsule, hospitalisation, food and care, examinations, admission and discharge consultations and sedation if required. **We do not undertake any other procedures on the patient whilst they are in our care unless it is an emergency.** If for any reason we feel the cat should not be treated, we will send the cat back to the referring veterinarian and contact the clinic by phone or email. I have recently opened a treatment only facility in Box Hill South and am able to treat up to four cats at any one time, so the waiting times will not be as long.

Thankyou for referring your patients to us. If you require any further details, please don't hesitate to contact me on 0452 532 287. I would be glad to get any follow-up results, to allow me to keep records of treatment outcomes.

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