

Dear Colleague,

Re: Radioactive Iodine Treatment for Hyperthyroidism

Thank you for calling us to refer a cat to the Queen Mother Hospital for Animals (QMHA) for radioactive iodine treatment.

We enclose:

- A brief overview of what the treatment entails.
- A check-list of requirements that need to be met before cats can be seen for treatment.

Please read this carefully to make sure that your patient is a suitable candidate for radioactive iodine treatment. It is really important that a clinical history and relevant blood work are available to us at the time of the appointment. Please ensure that this is either sent ahead of time, or sent with the clients on the day.

The demand for treatment with radioactive iodine is high and unfortunately we often have a long waiting list. Please let one of our Receptionists know as soon as possible if an appointment needs to be cancelled, or postponed, for any reason, so another cat can be treated instead. If your client is undecided about whether to pursue radioactive iodine treatment and would like to discuss the options with us, please ask for a routine medicine appointment first - treatment can then be arranged for a later date if the owners wish to proceed.

We hope that the enclosed information sheet answers any questions regarding radioactive iodine treatment. If not, or if you are concerned that your patient may not be an ideal candidate for radioactive iodine treatment, or if you have not referred a cat to us for this treatment before, please telephone Reception (01707 666365) and ask if one of our Internal Medicine team can contact you.

Yours sincerely,



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RCVS, European and American Specialist in Small Animal Internal Medicine

Radioactive Iodine Treatment

What's involved?

A single dose of radioactive iodine (I^{131}) is given by subcutaneous injection. The iodine is concentrated in the thyroid gland where it emits beta-radiation, killing the surrounding hyper-functioning cells. Parathyroid gland function is unaffected. The iodine that is not concentrated in the thyroid gland is very rapidly eliminated in the urine, saliva and sweat in the first couple of days following the injection. The remainder is very slowly eliminated due to thyroid hormone turnover (with the I^{131} incorporated into the hormone) and due to decay of the isotope (the half-life of I^{131} is eight days). Cats must stay with us in an isolation facility for several weeks after the injection until most of the radioactivity has been eliminated. A Veterinary Nurse feeds them and cleans their cages morning and evening.

What does it cost?

The current cost of treatment is £2549.66* incl VAT. This cost is essentially a 'package deal' covering pre-treatment and post-treatment blood tests, the treatment itself and hospitalisation for two weeks. If the four week option is chosen, the current cost of treatment is £3093.66* incl VAT. This does not include the cost of treatment for any concurrent medical problems or any unexpected diagnostic tests. Two weeks prior to the appointment your client will be contacted to confirm and finalise instructions and will be required to pay a deposit of £500 which will be non-refundable unless: a cancellation is made two or more weeks before the appointment, the patient dies or for some reason the cat is deemed not to be suitable for treatment. This will also apply to clients who wish to claim direct, the deposit being refunded on receipt of payment from the insurance company.

** Prices may be subject to increase*

How successful is it?

A single radioactive iodine injection is successful in about 95% of cats that we treat.

How quickly will you know if it has worked?

The thyroid hormone concentration is generally normal or low by the time cats are discharged from the Hospital and they have often gained a little weight. Occasionally it takes a few more weeks before the thyroid hormone concentration drops to normal following treatment.

What needs to be done before the appointment?

1. Cats need to be confirmed as hyperthyroid on the basis of a total thyroxine (tT4) concentration above the laboratory reference range. Occasionally we see and treat cats with high - normal tT4 measurements where hyperthyroidism has been confirmed by other methods, but these cases are best discussed with us prior to referral. In our experience, free T4 measurements can be high in normal cats and therefore might be misleading. In house tests for T4 are also unreliable.
2. Where possible, to allow evaluation of renal function and to minimise any clinical deterioration, we recommend that cats are treated with methimazole (Felimazole®)/carbimazole (Vidalta®) or Hill's Y/D until two weeks before we see them. Obviously, if the reason a cat is being referred for radioactive iodine treatment is that the cat cannot tolerate the medications, or the owner is not able to pill the cat, or the cat will not eat the diet this will not be possible.
3. **Assessment of renal function.** Studies show that up to 50% of hyperthyroid cats will become azotemic with treatment irrespective of which method (i.e. medical / surgical / radioiodine) is used. This occurs because the GFR is increased in the hyperthyroid state and the cat's true renal function can only be evaluated once GFR reduces with normalisation of thyroid hormone. **After two - three weeks, once the cat's condition has stabilised on medication or diet, please check total thyroxine (tT4) and creatinine concentrations.** It is reassuring if the creatinine concentration remains in the reference range when the tT4 is reduced to <35 nmol/l; these cats are ideal candidates for radioactive iodine treatment.

If cats are minimally azotaemic but clinically improved on medical treatment, we will still consider treating them, but please call us to discuss the case before referral. If the tT4 is still high, the dose may need to be increased and blood tests repeated - please contact us for further advice if this is happening. If there is a long delay between the blood tests to assess renal function and the appointment with us, further blood tests could be done four – six weeks prior to the appointment to ensure that nothing significant has changed.

4. The owners must be instructed to stop the anti-thyroid drugs or dietary therapy two weeks before their appointment at the QMHA.
5. Cats need to be vaccinated for 'flu and enteritis' within the last year.

How long must the cat remain in isolation?

Our protocol regarding isolation of hyperthyroid cats has changed recently, so please read this carefully as owners may wish to discuss their options with you. All cats will be classified as either 'SHORT STAY' or 'LONG STAY' patients.

All cats treated with radioactive iodine will stay in the QMHA for a minimum of 15 days following the injection. The owner then has two options: either the cat may remain with us for an additional 8 days (a total stay of 23 days), or the cat may be discharged at 15 days if the owner is able to ensure that certain conditions are met. These conditions are that:

- The cat will be confined indoors and will use a litter-box.
- The owners are able to ensure that any children in the household will remain at a safe distance from the cat and its litter-box.
- There is no-one in the house that is pregnant, or trying to become pregnant.
- There is a secure outside storage area (garage, shed) where soiled litter can be stored for one month before being put out for collection. If this is not possible, special litter can be purchased that can be flushed down the toilet, but their plumbing must be in good working order to do this.
- They are prepared to limit the amount of time spent in close proximity to their cat for 8 days after he / she returns home.

If cats are discharged at 15 days, their owners will have to sign a document stating that these conditions will be met. Short stay patients are discharged **15 days** post-injection (this is a Thursday). Long stay patients are discharged **23 days** post-injection (this is a Friday), with the owner following basic hand hygiene after cleaning the litter box and normal husbandry skills.

The level of radioactivity emanating from the cats two weeks after treatment is relatively low, but this is considerably higher than background and will continue to be so for several weeks. The risks associated with this radiation level are small provided that sensible precautions are taken. To put this in context, radiation is all around us and owners receive a larger dose of radiation by living in Cornwall, or flying across the Atlantic, than by spending time with their cat following treatment with radioactive iodine.

Which cats aren't suitable for treatment?

1. Thyroid carcinoma. Although thyroid carcinoma can be treated with radioactive iodine (the most successful protocols involve surgical de-bulking first) the doses of radioactivity required are greater than those that we have authorisation to hold. So, unfortunately at the moment we are unable to offer treatment to these cats.
2. Naughty cats! We appreciate that hyperthyroid cats can be tetchy and it is not a particular problem if, for example, a cat is difficult to collect blood samples from. If the cat is less than angelic in its behaviour, it will probably be anaesthetised for the injection of radioactive iodine. The cats that we cannot accept for treatment are ones that will not allow their cages to be cleaned without attacking the Nurses, which increases the risk of contaminating them with radioactivity-containing urine.

3. Cats with significant, concurrent, medical problems. If cats become ill after they are injected, we cannot attend to them without being exposed to high levels of radioactivity. Therefore we cannot take cats that are known to have other serious concurrent problems. Medications can be put in the cat's food, but the cats cannot be given tablets directly.
4. Unsuitable owners! Some cats would be fine to treat with radioactive iodine, but their owners will not be parted from them for required time (typically two weeks). We are unable to compromise on the amount of time that we keep the cats here in the Hospital. It is not possible for owners to visit while their cats are with us.

Follow-up appointments:

Cats should have a check up at **three** and **six** months after their injection date. We are very happy to see cats here for this appointment, but we understand that it is not always easy for owners to return to us, or they may not be keen to subject their cats to further travel. We are, therefore, happy for the check-ups to be run through your own clinics if this is convenient.

We recommend a complete physical examination, including body weight and blood pressure measurement, serum biochemistry and thyroid testing as well as urinalysis at each visit. Laboratory fees are prepaid only for the six month test, not for the three month.

Six months after injection, we advise collection of blood (2ml serum) for thyroid and biochemical testing - this laboratory cost is included in the cost of the initial package and we will provide an RVC Laboratory Submission Form to your client. At the same appointment, urinalysis for SG and sediment examination to check for urinary tract infection should be performed. We will contact you with the results of these tests as soon as they are available. We have also asked that all clients complete a quality of life questionnaire for their cat at this time (www.surveymonkey.com/s/catquality).