



Hyperthyroidism (Overactive Thyroid)

What is hyperthyroidism?

Hyperthyroidism is an endocrine disorder where the thyroid produces too much thyroid hormone. It is one of the most common endocrine disorders in cats, but is rare in dogs. This sheet therefore refers to cats, but applies largely to dogs too.

What causes hyperthyroidism?

The thyroid gland has 2 parts, one on each side of the windpipe. Hyperthyroidism is the result of nodules or tumours in the thyroid glands, which produce thyroid hormones in excessive amounts.

In the vast majority of cases (approximately 98%) they are benign, slow-growing tumours, and many patients have them in both sides of the thyroid gland (i.e. bilaterally). Some patients also have abnormal thyroid tissue in additional places, such as the chest (this is not cancerous spread).

In the remaining 2%, the tumour may be a malignant adenocarcinoma, and these can spread.

It is unknown what causes particular animals to develop these nodules or tumours, but some evidence suggests some cat food tins, excessive dietary iodine, pesticides, and fire retardants may contribute.

What are the signs of hyperthyroidism?

Excessive thyroid hormone speeds up the metabolism, which puts stress on many body systems. The signs are therefore wide-ranging, but the most common are:

- Weight loss despite a ravenous appetite
- Excessive urination and thirst (known as polyuria and polydipsia, or PUPD)
- Vomiting and/or diarrhoea
- Irritability, aggression, nervousness, or hyperactivity
- Scruffy coat or excessive grooming
- Muscle weakness (in severe cases leading to difficulty holding the head up)

How is hyperthyroidism diagnosed?

A diagnosis may start with you noticing signs at home and talking to your vet, or your vet noticing weight loss during a routine visit. Your vet may then perform:

- A *physical exam* which may show an enlarged thyroid (but not always), low bodyweight, a rapid heart rate, and sometimes a heart murmur
- *Blood tests* which initially are likely to include:
 - Total thyroid hormone (total T4) which is high in 90% of hyperthyroid cats
 - Kidney values, because many hyperthyroid cats also have chronic kidney disease
 - Liver values, because excessive thyroid hormone can affect the liver

- *Additional blood tests* requested by your vet may then include
 - Pro-BNP (a heart value), because excessive thyroid hormone can damage the heart
 - Free T4 may be run if your cat's total T4 level is high-normal but their signs are still suspicious, because 10% of hyperthyroid cats can be missed by total T4 tests
- *Urine tests* to check kidney function and rule out other causes of your pet's signs
- *Echocardiogram* (ultrasound scan of the heart), if a murmur is heard, because excess thyroid hormone can cause the heart muscle to thicken

How is hyperthyroidism treated?

There are a number of treatment options, and not all are suitable for every patient. Discuss the options carefully with your vet to decide which is most suitable for your pet.

“Curative” therapies refer to those which remove the tumours. “Non-curative” suppress the excess thyroid hormone but leave the tumours in place.

Things to bear in mind when choosing a treatment:

- Occasionally, benign nodules can eventually transform into malignant adenocarcinomas, and so “curative” therapies are encouraged in younger cats
- Curative therapies may carry a higher up-front cost, but usually work out more cost-effective than 2 or more years of non-curative therapies
- Hyperthyroidism can mask kidney disease. Sometimes, your vet may first suggest a reversible “non-curative” therapy to see how the kidneys cope, before committing to an irreversible “curative” treatment

Dietary Therapy

This is a non-curative therapy because the tumour remains in place. By restricting the amount of iodine in the diet, such as feeding *Hill's y/d*, we can limit the amount of thyroid hormone that is produced.

- | | |
|------------------------------------|--|
| ✓ Very safe | ✗ Long-term cost of special diet |
| ✓ Reversible | ✗ Cats that hunt can undo the diet |
| ✓ May be suitable for elderly cats | ✗ Difficult in multi-cat homes |
| ✓ May be effective in mild cases | ✗ Less effective in moderate to severe cases |
| ✓ No anaesthetic or hospital stay | ✗ Leaves the tumour in place |

Medical Therapy

Medications such as methimazole (Felimazole), thiamazole (Thyronorm), and carbimazole (Vidalta) can be given as a pill, liquid, or skin gel, to reduce production of thyroid hormones. This is also non-curative as it does not shrink the tumours, and will need to be given for life.

- | | |
|--------------------------------------|--|
| ✓ Reversible | ✗ Long-term cost of medication |
| ✓ Effective in the majority of cases | ✗ Lifelong medication and regular monitoring |
| ✓ No anaesthetic or hospital stay | ✗ Side effects are relatively common |
| | ✗ Dose may increase as tumour grows |

Radioiodine Therapy

This is considered a “curative” treatment because it removes abnormal thyroid tissue, and is curative in 99% of cats. It is currently considered the “gold standard” treatment for hyperthyroidism.

For this treatment, your cat stays at a specialist centre (such as the Hyperthyroid Cat Centre in Wetherby) for a period, most commonly 4-5 days but sometimes longer. Here, they receive an injection of radioactive iodine under the skin. The radioiodine is taken up only by abnormal thyroid tissue, which is killed. Healthy thyroid tissue, and other body tissues, are left intact.

- | | |
|---|---|
| ✓ Curative in 99% of cases | ✗ Highest up-front cost |
| ✓ Very safe | ✗ Hospital stay |
| ✓ No anaesthetic | ✗ Small risk of causing underactive thyroid |
| ✓ Kills abnormal tissue in hard-to-reach places like the chest cavity | ✗ Requires travel to specialist centre |
| ✓ Cost-effective in the long-term | ✗ Hospital stay is longer if you cannot isolate your radioactive cat for a time at home |
| ✓ Recurrence of disease is very rare | |

Surgery

This is a “curative” therapy where a surgeon removes the abnormal thyroid tissue under an anaesthetic, but this does not mean all cats will be cured. A surgeon may not be able to remove all the abnormal tissue, especially if there is some in the chest, and there is a risk of removing the parathyroid glands, which sit on top of the thyroid glands. If both sides must be removed, there is a risk of hypothyroidism (underactive thyroid).

- | | |
|---|--|
| ✓ Cost-effective in the long term | ✗ High upfront cost |
| ✓ Available at Minster | ✗ Short hospital stay |
| ✓ Curative for a majority of cats | ✗ Risk involved in surgery and anaesthetic |
| ✓ Often recommended for cancerous tumours | ✗ 20% recurrence rate due to inaccessible tissue |
| | ✗ Risk of hypothyroidism if both sides removed |
| | ✗ Risk of hypoparathyroidism if parathyroids damaged |

Additional Treatments

In addition to treating the thyroid tumour or suppressing excess thyroid hormone, your pet may need treatment for complications of the disease. This may include:

- *Heart medications* if your cat’s heart is thickened or failing due to hyperthyroid damage
- *Blood pressure medication* such as amlodipine (Amodip) if your cat has high blood pressure
- *Thyroid or vitamin D supplementation* e.g. if your cat’s treatment causes an underactive thyroid or parathyroid gland damage

What is the prognosis/outlook for hyperthyroidism?

Benign tumours treated with a curative therapy such as radioiodine carry an excellent prognosis, and the vast majority of cats are cured for life after this. Good control and a very good quality of life is usually achieved with medication, but there is a small risk of tumour transformation in the future, or complications if control is not maintained with regular check-ups.

Prognosis for malignant adenocarcinomas is more guarded, as these can recur and spread. However, these are rare and surgery or high-dose radioiodine may be curative. Prognosis for cats that have both hyperthyroidism and chronic kidney disease is also more guarded, as striking a balance between treating both conditions can be challenging.

Useful resources

The Hyperthyroid Cat Centre <https://www.hyperthyroidcatcentre.co.uk/>
International Cat Care <https://icatcare.org/advice/hyperthyroidism/>