



Thyroid Diseases in Dogs and Cats (part 2)



I hope you enjoyed the first part of this series. This article covers 'the other' thyroid disease of dogs and cats - hypothyroidism in dogs. Like hyperthyroidism in cats, hypothyroidism is the most commonly diagnosed hormone disorder in dogs.

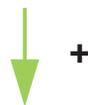
Hypothyroidism in Dogs

Pathology and Hormone Feedback Mechanisms

In order to understand the pathology behind hypothyroidism in dogs, it is important we understand a little bit about how the release of T3 and T4 is controlled. The diagram below illustrates this. TRH produced in the hypothalamus (an area of the brain) stimulates the release of TSH from the pituitary gland, which in turn stimulates production of T3 and T4 from the thyroid gland. T3 and T4 then inhibit production of both TRH and TSH, thereby preventing their own production and keeping their levels within the correct range.

It follows a classic 'negative feedback' system, which is a system the body uses to keep a large number of parameters (eg. temperature, blood sugar, blood pressure, salt levels, hormone levels etc.) within close limits and as stable as possible. The idea behind feedback mechanisms is very simple but, in reality, they can become very complicated with multiple 'inputs' and 'feedbacks' taking part.

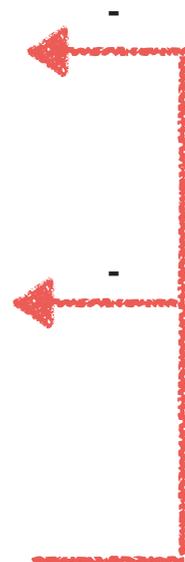
TRH (thyrotrophin-releasing hormone)
produced in the hypothalamus in the brain



TSH (thyroid-stimulating hormone)
produced in the pituitary gland



T3 & T4
produced in the thyroid gland



In hypothyroidism, there is too little production of T3 and T4. In most cases, this is due to problems with the thyroid gland itself (primary hypothyroidism). However, hypothyroidism can also develop due to problems with the pituitary gland (too little TSH - secondary hypothyroidism) or the hypothalamus (too little TRH - tertiary hypothyroidism). It can also develop due to problems with the supply of iodine, which is needed to make the thyroid hormones, or inappropriate destruction of, or response to, the thyroid hormones in the tissues; however, both of these conditions are rare.

Primary hypothyroidism may be congenital (present since birth) or acquired (develops later on in life). Acquired, primary hypothyroidism is most common in young to middle age, large breed dogs, especially Golden Retrievers, Dobermans and Irish Setters. Congenital primary hypothyroidism presents at a much younger age, with very different clinical signs. It is more commonly seen in Boxers and Giant Schnauzers. **Acquired, primary hypothyroidism is by far the most common presentation of hypothyroidism in dogs**, and so we will focus on this from now on.



Signs and Diagnosis

The signs of acquired hypothyroidism in dogs are very variable and often very vague. However, the 'classic combination' is lethargy, poor exercise tolerance, **weight gain without an increase in food intake**, intolerance to cold, and hair loss along the flank, chest and neck. Your dog may also have a low heart rate and low temperature.

Additional signs include:

- dry and dull hair coat
- thickening and hyper-pigmentation (darkening) of the skin
- recurrent skin infections
- changes in the reproductive cycle in un-spayed bitches, and a loss of fertility in un-castrated males
- loss of nerve function to the face, ears, vestibular system (the balance system), larynx (part of the throat), oesophagus, and limbs (ie. lameness)
- signs of brain damage
- constipation

- fat deposits within the eye

For those interested, the main sign of congenital hypothyroidism is ‘disproportionate dwarfism’. Puppies grow with a short broad skull, short thick limbs, and have delayed teeth development. Like with acquired hypothyroidism, you also see lethargy, and skin and coat changes.

As with hyperthyroidism in cats, in many cases, hypothyroidism can be diagnosed by clinical signs, history, and ‘in-house’ measurement of T4 levels. However, T4 levels can be affected by breed, age, illness and medication, so results need to be interpreted with care. Again, it is often recommended that a full blood test is done at the same time, although this is more often to aid diagnosis than to guide treatment protocol and prognosis. If there is any ambiguity, an additional blood test may be needed that will require sending the blood away to an external lab. **As with hyperthyroidism in cats, treatment of hypothyroidism is lifelong. However, it is safer to perform a ‘therapeutic trial’ in suspect hypothyroid dogs than it would be in suspect hyperthyroid cats.**

Treatment

The treatment of hypothyroidism in dogs is daily medication of a synthetic form of T4 called levothyroxine (Thyforon). It is a safe, readily available, relatively cheap, and very effective medication in tablet form, so can be given at home. Improved activity and enhanced enthusiasm for life should be evident within 2 weeks.



However, because absorption of the drug is poor, it can take some time to find the right dose and correct frequency of administration. As in cats, T4 levels need to be monitored when treatment is first started, and the medication must always be given for at least 3 months to assess whether your dog is going to respond. It can take up to 6 months for improvement in skin and coat changes to become apparent.

If you have any questions about hypothyroidism in dogs, or you feel your dog may be showing any signs of it, please get in touch. In the next set of articles we will deal with the urinary system, and cover cystitis/urinary tract disease in cats and urinary incontinence in dogs.