

# Hypothyroidism

## ABOUT THE DIAGNOSIS

**CAUSE:** Hypothyroidism is a disorder caused by an underproduction of hormones that are made in the thyroid gland. Just like in human beings, the thyroid gland in dogs and cats is located under the skin on the front part of the throat just below the larynx (voice box or Adam's apple).

Hypothyroidism occurs most commonly in dogs and very rarely in cats. Breeds that have a greater than average occurrence of hypothyroidism include the golden retriever, Doberman pinscher, Irish setter, miniature schnauzer, and Great Dane.

Thyroid hormones, primarily thyroxine ( $T_4$ ), are made by the thyroid gland tissue and are released from the thyroid glands to circulate throughout the body. They reach all tissues of the body and are responsible for maintaining the body's metabolic rate and oxygen consumption. A deficiency of thyroid hormones can affect every system in the body, including the dermatologic (skin), cardiac, muscular, skeletal, reproductive, and neurologic systems, as well as the production of red blood cells. The effects are variable from one individual to the next, and hypothyroidism may produce an entire spectrum of symptoms, from very few to multiple severe problems.

The production of thyroid hormones by the thyroid gland is controlled by signals sent from a part of the brain—the pituitary gland. Therefore, hypothyroidism is considered **primary** if the problem is with the thyroid gland itself and **secondary** if the problem is caused by the pituitary gland. Specific reasons (causes) that lead to hypothyroidism include the following:

- Lymphocytic thyroiditis is a low-grade, long-standing inflammation of the thyroid gland that may be caused by the body's own immune system (a case of mistaken identity during which the body perceives its own thyroid tissue as foreign and proceeds to destroy it). The result of this inflammation is that normal thyroid tissue is obliterated and is replaced by nonfunctional, fibrous tissue (scar tissue). This is by far the most common reason for hypothyroidism in dogs.
- Neoplasia (cancer) of the thyroid gland or metastatic neoplasia (cancer from another part of the body that spreads to the thyroid gland) can cause destruction of thyroid tissue. Thyroid cancer is an uncommon cause of hypothyroidism.
- Surgical removal of the thyroid gland for medical reasons may not leave enough healthy thyroid tissue, resulting in hypothyroidism.
- Treatment of thyroid tumors that involves radioactive iodine aims to destroy tumor tissue only, but in about 1% of individuals who undergo this treatment, there may not be enough remaining thyroid tissue for the body's needs, leading to hypothyroidism.
- Decreased production of thyroid stimulating hormone (TSH) by the pituitary gland. Since this hormone is the required signal for normal thyroxine production by the thyroid gland, deficiency of TSH leads to inadequate thyroxine production and resulting hypothyroidism.
- Some medications, including corticosteroids (cortisone-like drugs) and sulfa-containing antibiotics, can temporarily lower the concentration of thyroid hormones, but essentially never enough to cause symptomatic hypothyroidism.
- Dietary iodine deficiency is a potential but extremely rare cause of hypothyroidism because most dog foods are nutritionally balanced for iodine.

- Congenital (present at birth) hypothyroidism is called cretinism and is a cause of dwarfism. This occurs very rarely in dogs and cats.

Because hypothyroidism affects almost all body systems, symptoms are varied; however, common symptoms include lethargy, weight gain, hair loss (especially on the tail), recurrent skin infections, dull or dry hair coat, overall weakness, and in extreme cases, seizures. If the onset of hypothyroidism occurs when the dog is still a puppy (cretinism), mental dullness and retarded physical growth are common.

**DIAGNOSIS:** Since the symptoms may be so varied and sometimes very subtle, hypothyroidism easily can be overlooked in its early stages or mistaken for other diseases. To recognize hypothyroidism accurately, your veterinarian will need to take a complete medical history for your pet, including asking you questions regarding your dog's diet, prior medication, and duration of symptoms, as well as perform a thorough physical examination. Routine blood tests, including a complete blood count (CBC) and serum biochemical profile, and a urinalysis are necessary to assess the impact of hypothyroidism on the different organ systems. These tests provide information about kidney and liver function and may reveal clues that point to hypothyroidism.

Confirmation of hypothyroidism is done through blood testing for thyroid hormone levels. Several tests are available to measure thyroid hormones. In most instances, a panel of thyroid hormone levels, including thyroxine ( $T_4$ , or free  $T_4$ ) and thyroid-stimulating hormone (TSH) is measured at the same time, and this helps to confirm that, first, the thyroid hormone level is indeed low, and second, that this low level is not part of the daily fluctuations that might be expected as part of normal variation. The term "sick euthyroid syndrome" is a name given to the low thyroid hormone levels commonly encountered in any individual who is ill for any reason but has normal thyroid function. This situation is an impostor for hypothyroidism and it explains the importance of checking both  $T_4$  and TSH in a thyroid profile. This way, the veterinarian avoids overdiagnosis of hypothyroidism in dogs that actually have suppressed thyroid function because of other unrelated illness or simply daily fluctuations.

## LIVING WITH THE DIAGNOSIS

When recognized and treated properly, hypothyroidism is usually a very mild condition with which dogs can live comfortably, happily, and actively for their entire lives. A dog diagnosed with hypothyroidism generally requires lifelong supplementation with daily oral tablets of thyroid hormone (synthetic thyroxine). Thyroid hormone supplements are extremely safe, and while it is important to watch for mild signs of thyroid excess (including nervousness, excitability, muscle tremors, increased appetite [polyphagia], increased urination and drinking [polyuria/polydipsia], and excessive panting), these are very uncommon. If any of these or other abnormal signs are observed, they may be due to the thyroid supplementation or to other conditions altogether and warrant a call to your veterinarian.

Your veterinarian will usually recommend periodic blood testing to measure the thyroxine level as a routine precaution, especially if overdosage or underdosage is suspected or if the dosage is changed.

## TREATMENT

Hypothyroidism is treated by giving a synthetic hormone, thyroxine, in the form of a small tablet (small pill) by mouth once or twice daily. This medication needs to be given for the rest of the dog's life, and it can be given with food.

### DOs

- Inform your veterinarian if your pet has ever been diagnosed with a medical condition or is taking medication since these may be influencing thyroid status. If possible, bring the medication container to the veterinary clinic.
- Give medication exactly as directed by your veterinarian, and if you are concerned about possible negative effects, discuss them with your veterinarian immediately rather than simply discontinuing the treatment or changing the dosage. If your pet is feeling well enough to make you consider stopping the medication, chances are good that this is due to the medication and symptoms would be likely to start if the medication is not continued.
- Realize that hypothyroidism is usually a lifelong condition, but with proper diagnosis and daily pill administration, hypothyroid dogs are usually asymptomatic and they have a normal quality of life and normal lifespan.

### DON'Ts

- Do not change the dosage or discontinue medication without consulting your veterinarian.
- Do not assume that human and veterinary thyroid medication are interchangeable. The difference in thyroid hormone metabolism between dogs and humans is such that a dog requires much, much more thyroid hormone (as much as 10 times more) than humans.
- Do not use hypothyroidism to deny the importance of weight loss if your dog is overweight or obese. While it is true that a low circulating thyroid hormone level can cause some degree of unintended weight gain in dogs and cats, this is usually mild. Therefore, the connection between hypothyroidism and mild weight gain should not become a crutch. Hypothyroidism and obesity may occasionally coexist, and when they do, a program of deliberate weight loss, in addition to thyroid supplementation, must be carried out to help your dog's health.

## WHEN TO CALL YOUR VETERINARIAN

- If you cannot keep a scheduled appointment.
- If you are unable to give medication as directed.
- If symptoms do not improve after giving medication and especially if they worsen.
- If you believe that your dog is having a negative reaction (hives, excess drooling, anxiety, hyperactivity, vomiting, diarrhea, respiratory difficulty, etc.) to medication. The occurrence of negative reactions to thyroid supplements is extremely uncommon.

## SIGNS TO WATCH FOR

- General symptoms of hypothyroidism that is not adequately treated or controlled include: lethargy, weight gain, mental dullness, exercise intolerance, and intolerance of cold temperatures (heat-seeking behavior).
- Dermatologic signs of hypothyroidism: hair loss (especially on the tail), dry/scaly or oily skin, severe dandruff (skin scales), recurrent skin inflammation or infections, ear infections, dark spots (hyperpigmentation).
- Neuromuscular signs of hypothyroidism: awkward gait or loss of balance (ataxia), seizures, general weakness.
- Gastrointestinal signs of hypothyroidism: diarrhea, constipation.

## ROUTINE FOLLOW-UP

- Follow-up visits are generally scheduled periodically (every few months initially, then yearly or twice yearly) to measure the blood thyroxine level.



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