

# Hypothyroidism in Dogs

Rhea V. Morgan, DVM, DACVIM (Small Animal), DACVO

## BASIC INFORMATION

### Description

Hypothyroidism develops from a decrease in circulating thyroid hormone levels in the blood. It is one of the more common hormonal problems in the dog. Because thyroid hormone is needed to maintain normal metabolism, hair growth, activity levels, reproduction, heart function, and other bodily functions, the manifestations of hypothyroidism may involve many organs.

The thyroid gland produces two hormones, T3 and T4, and both are usually low in hypothyroidism.

### Causes

*Primary hypothyroidism* develops from inflammation of the thyroid gland, which may be caused when the body's immune system attacks the gland. Destruction and scarring of the gland may also arise from infections, tumors, or trauma.

*Secondary hypothyroidism* develops when the brain does not produce thyroid-releasing hormone (TRH) or thyroid-stimulating hormone (TSH, the hormone that tells the thyroid gland to make thyroid hormone).

- Congenital hypothyroidism (called *cretinism*) is very rare in the dog. Inherited goiter is also rare but can occur in toy fox terriers.
- TRH or TSH deficiency has been seen in giant schnauzers and boxers.

Hypothyroidism can also develop with use of the trimethoprim-sulfa drugs and following surgery or radiation therapy of the thyroid gland or neck region.

True hypothyroidism must be differentiated from the significant and temporary effects that other diseases and certain drugs can have on thyroid hormone levels. In this instance, hormone levels fall during the illness or while the drug is being given, and they usually return to normal after the illness has subsided and the drugs are withdrawn.

### Clinical Signs

Most dogs are middle-aged, and spayed females and castrated males may be affected more often than others. The disease is common in golden retrievers, Doberman pinschers, and certain other breeds. Signs are often gradual in onset and can be quite variable and include the following:

- Dermatologic signs: symmetrical hair loss, dull and poor-quality coat, seborrhea
- Metabolic signs: lethargy, seeks warm areas, weight gain and obesity, inability to exercise
- Cardiovascular signs: low heart rate, atherosclerosis (hardening of the arteries)
- Neurologic signs: muscle weakness, shrinkage of muscles, paralysis of the larynx (vocal cords) resulting in breathing problems, paralysis of some nerves around the head

- Reproductive signs: infertility, abnormal or failure of heat cycles
- Cretinism: growth and mental retardation, retention of puppy coat, overly large head, skeletal dwarfism

### Diagnostic Tests

Hypothyroidism is diagnosed by measuring thyroid hormone levels in the blood.

- Blood tests can be done for T3, T4, freeT4 (separation of T4 from its carrier proteins), and TSH.
- T4 testing alone is often used as a screening test and to monitor the effects of therapy. Full assays of all four hormones are needed in some animals to reach a diagnosis.

Routine laboratory tests may reveal other abnormalities, such as anemia, high cholesterol and triglyceride levels, and altered liver function. Laboratory tests are also necessary to rule out other causes of the clinical signs seen. Other tests that can be run in certain cases include thyroid antibody assays, and thyroid scans, and ultrasounds. Sometimes the diagnosis of hypothyroidism can require repeated testing, because initial results may be unclear or nondiagnostic.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Hypothyroidism is treated by supplementation with oral L-thyroxine, the commercially available form of T4. Dosages require adjustment in each individual animal, with some dogs requiring once-daily and some twice-daily administration.

### Follow-up Care

Thyroxine pills are usually given for 2-6 weeks, after which thyroid assays are repeated to determine whether the hypothyroidism has improved. T4 levels are measured at a specific time after the thyroid pill is given; your veterinarian will instruct you as to when the test should be run. Depending on the results, the dosage may be raised, lowered, or left the same. Continued, periodic monitoring of T4 is needed throughout the course of the dog's life to ensure that thyroid values remain in the normal range. Most dogs require lifelong therapy, because most thyroid glands do not recover normal function.

### Prognosis

Most clinical signs begin to improve within 3-4 weeks, except for neurologic signs, which can take several months. Exercise and activity levels often improve dramatically, and appetite usually returns to normal. Many hair coat problems also resolve with time. Dogs usually do well on the thyroid supplement and go on to live normal lives.