

# Hypothyroidism

## (Low Levels of Thyroid Hormone)

### Basics

#### OVERVIEW

- Clinical condition that results from inadequate production and release of thyroid hormone by the thyroid gland
- Thyroid hormones are known as “triiodothyronine” or T<sub>3</sub> and “tetraiodothyronine” or T<sub>4</sub>
- Decreased levels of thyroid hormone can affect the body in many ways

#### GENETICS

- No known genetic basis for the inheritance of primary hypothyroidism in dogs
- Congenital (meaning present at birth) hypothyroidism has been reported in toy fox terriers and giant schnauzers (dogs) and in Abyssinians (cats)

#### SIGNALMENT/DESCRIPTION OF PET

##### Species

- Dogs
- Cats—rare

##### Breed Predilections

- Larger-breed dogs are more likely to develop hypothyroidism
- Breeds reported to have increased likelihood of developing hypothyroidism as compared to other dog breeds include the golden retriever, Doberman pinscher, Great Dane, and Irish setter; several smaller-breed dogs also appear to have increased likelihood of developing hypothyroidism, including the miniature schnauzer, cocker spaniel, poodle, and dachshund

##### Mean Age and Range

- Most common in middle-aged dogs (usually first diagnosed at 7 years of age)

##### Predominant Sex

- No predominant sex has been demonstrated to be at increased risk of developing hypothyroidism

#### SIGNS/OBSERVED CHANGES IN THE PET

- Clinical signs associated with hypothyroidism are vague and involve many different organ systems of the body
- Sluggishness (lethargy); weight gain; and hair loss (especially in areas of increased wear, such as the elbows) are the most common signs reported to the veterinarian by the owner; less common signs include skin infections (known as “pyoderma”) that often recur; darkened skin (known as “hyperpigmentation”); and dry brittle hair



coat

- Rarely, facial paralysis
- Weakness

### **Dogs**

- Most commonly noted signs include abnormalities of the skin, weight gain, sluggishness (lethargy), and weakness. Most changes appear to be secondary to decreased metabolism due to decreased levels of thyroid hormones. Skin changes are very common, but are not seen in every pet with hypothyroidism

### **Skin Abnormalities**

- Dry, lackluster hair coat; hair becomes brittle and hair loss (known as “alopecia”) is seen in areas of increased wear; usually includes the lower part of the chest and neck, lower part of the abdomen, and tail
- Symmetrical loss of hair on both sides of the trunk (known as “bilaterally symmetrical truncal alopecia”); the hair loss is non-itchy
- Loss of primary hair is most common, with guard hairs remaining, resulting in a short, fine hair coat Darkened skin (hyperpigmentation) and increased thickness of the skin are common, particularly in friction areas’ some dogs develop hair loss of tail or “rat tail”
- Excessive scaling of the skin (known as “seborrhea”)—common; may be localized or have a more generalized distribution pattern
- Secondary bacterial infection of the skin (pyoderma) as well as parasitic (example, *Demodex*) infestation and yeast (example, *Malassezia*) infections are common; these secondary skin conditions may cause the skin to be itchy (known as “pruritus”)
- Inflammation of the outer ear (known as “otitis externa”) may be seen

### **General/Metabolic Abnormalities**

- Sluggishness (lethargy)
- Weight gain

### **Reproductive Abnormalities**

- Female dogs (a female dog is known as a “bitch”)—Infertility and prolonged interval between heat or estrus cycles (known as “anestrus”); failure to cycle; decreased libido; and inappropriate mammary gland (breast) development have been reported in hypothyroid dogs
- Male dogs—decreased fertility; decrease in the size of the testicles (known as “testicular atrophy”); poor sperm motility; and decreased libido have been reported in hypothyroid dogs

### **Abnormalities Involving the Nervous System**

- **Seizures**; a wobbly, incoordinated or “drunken” appearing gait or movement (known as “ataxia”); and coma may be seen, but are rare

### **Abnormalities of the Heart**

- Rarely, a slow heart rate (known as “bradycardia”); irregular heartbeats (known as “cardiac arrhythmias”); and poor heart function

### **Abnormalities of the Eyes**

- Rare
- Cholesterol deposits in the cornea; the “cornea” is the clear outer layer of the front of the eye
- Dry eye (known as “keratoconjunctivitis sicca” or KCS)
- Inflammation of the moist tissues of the eye (known as “conjunctivitis”)

### **Congenital (Present at Birth) Hypothyroidism**

- Sluggishness (lethargy) and general inactivity
- Dwarfism
- Hair loss (alopecia)
- Constipation—more common in cats

## **CAUSES**

- Inflammation of the thyroid gland characterized by the presence of lymphocytes (known as “lymphocytic thyroiditis”); lymphocytes are a type of white blood cell formed in lymphatic tissues of the body; lymphocytes are involved in the immune process
- Wasting away or decrease in size of the cells in the thyroid for unknown cause (so-called “idiopathic thyroid

- atrophy”)
- Cancer
- Disease of the pituitary gland; the “pituitary gland” is the master gland of the body—it is located at the base of the brain; it controls many other glands in the body
- Congenital (present at birth) thyroid disease
- Dietary iodine deficiency; iodine is necessary for production of thyroid hormone
- Secondary to surgery or radiation (known as a type of “iatrogenic hypothyroidism”)

## **RISK FACTORS**

- Surgical removal of the thyroid gland (known as “thyroidectomy”)

## **Treatment**

### **HEALTH CARE**

- Outpatient

## **Medications**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Synthetic thyroid hormone supplementation easily treats hypothyroidism
- Levothyroxine is a thyroid (T<sub>4</sub>) replacement hormone; also known as “L-thyroxine”; it is available in human and veterinary products
- Generic forms of levothyroxine should be avoided due to variability in bioavailability of the hormone
- Adjust dosage on the basis of serum thyroid hormone (T<sub>4</sub>) concentration from blood obtained after giving the thyroid hormone replacement medication and clinical response to therapy

## **Follow-Up Care**

### **PATIENT MONITORING**

- Check serum thyroid hormone (T<sub>4</sub>) levels after 4 weeks of therapy
- Serum thyroid hormone (T<sub>4</sub>) concentrations should be monitored and timed so that a blood sample is obtained 6 hours after administering the medication for pets receiving thyroid hormone supplementation twice a day; a blood sample should be obtained immediately prior to administration of the medication and 6 hours after administering the medication for those pets receiving thyroid hormone supplementation once a day
- Thyroid function should be monitored every 6 months of thyroid hormone supplementation

### **PREVENTIONS AND AVOIDANCE**

- Adequate thyroid hormone supplementation with routine monitoring should avoid recurrence of this condition

### **POSSIBLE COMPLICATIONS**

- If untreated, hypothyroid pets are at increased risk of developing myxedema (condition characterized by accumulation of mucopolysaccharides in the skin that lead to non-pitting edema; gives the face the classic “tragic” expression associated with hypothyroidism); myxedema coma; and atherosclerosis (condition in which fatty deposits, usually cholesterol, accumulate in the lining of arteries)
- Oversupplementation of thyroid hormone can result in medication-induced hyperthyroidism (known as “iatrogenic hyperthyroidism”)

### **EXPECTED COURSE AND PROGNOSIS**

- Primary hypothyroidism can be controlled easily and successfully; the prognosis for pets is excellent, when treated appropriately
- Life expectancy should be normal
- Secondary and congenital (present at birth) forms of hypothyroidism have a guarded-to-poor prognosis

## **Key Points**

- **Treatment is lifelong**

- Hypothyroidism is managed easily with thyroid hormone supplementation; the medication is administered by mouth (known as “oral thyroid hormone supplementation”)
- Dose adjustments are common in the early stages of treatment as the pet's response to oral thyroid hormone supplementation is evaluated
- Most clinical signs will resolve over time with appropriate thyroid hormone supplementation
- Adequate thyroid hormone supplementation with routine monitoring should avoid recurrence of this condition

## CLIENT INFORMATION SHEET

### HYPOTHYROID in the DOG (Low Thyroid)

Hypothyroidism is the result of decreased production of thyroid hormone. This is normally caused by the thyroid gland ceasing to function properly. Hypothyroidism can be a debilitating disease if not treated. However, with proper treatment, your dog **will** live a longer and healthier life.

### SYMPTOMS

The clinical signs of hypothyroidism can be a loss of hair often on the tail, hind quarters or flank that is not a result of scratching. Other signs include dry scaly skin, dull brittle hair, bleaching of the hair coat and possibly the development of oily skin and skin and/or ear infections. Advanced cases of hypothyroidism may cause your dog to become lethargic and overweight, even on a limited diet. The animal may not want to exercise, may seek out warm places and may have cold clammy skin. We even see cases of organ failure secondary to low thyroid function.

### DIAGNOSIS

A blood test will be done to help confirm the diagnosis of hypothyroidism. Your veterinarian will prescribe medication. The product of choice is levothyroxine sodium tablets. This medication must be administered once or twice a day, according to your veterinarian's instructions. (usually twice daily in most dogs)

You should see an improvement in your dog's overall health in approximately two to four weeks, although total improvement takes about 90 days. Changes in dog's coat and weight will take anywhere from one to six months, depending on the rate of new hair growth of your dog. Not all obese dogs will lose weight well. In many cases a very low-calorie diet is available to speed up the process.

### FOLLOW-UP

In four weeks, your veterinarian will require another blood sample. If the results warrant a change, the dosage may be adjusted to maintain proper thyroid blood levels. When the adjustment is made you will need (and be able to) refill the prescription and administer the medication to your dog according to your veterinarian's instructions. The thyroid medication is needed for the life of your pet. Routine check-ups and blood testing will be necessary to maintain a healthy and happy dog. (Every 6 months.)