CANINE HYPOTHYROIDISM: Diagnostic & Monitoring Algorithm

Review results of physical examination, drug history, CBC, chemistry profile with electrolytes, and total T₄.

Low T₄ (<0.8 µg/dL)
No evidence of NTI* and clinical signs consistent with hypothyroidism (i.e., dull haircoat or alopecia, overweight, low energy level)
Supplement with Levocrine™ Chewable Tablets (levothyroxine sodium) at 0.1 mg/10 lb. (4.5 kg) of body weight BID. Recheck after four weeks.

Low T₄ (<0.8 µg/dL) & NTI* present
Treat NTI
Repeat T₄ measurement after resolution of NTI.

Low to low-normal T₄ (<2 µg/dL)
Normal T₄ (2-4 µg/dL)

Low-normal T₄ (0.8-2 µg/dL) with additional clinical signs.

FreeT₄ + cTSH

Follow-up T₄ (4-6 hours post-pill), physical examination and clinical history from owner

If response
If no response

(2.1-5.4 µg/dL) Continue current thyroid supplement and retest in 3-6 months
(>5.4 µg/dL) Decrease dose, especially if signs of thyrotoxicosis are noted, and retest in 4 weeks.

Low freeT₄ and high cTSH
HYPOTHYROIDISM** start treatment

Low freeT₄ and cTSH levels
HYPOTHYROIDISM VERY UNLIKELY look for other causes of illness

Normal freeT₄ and cTSH levels

(2.1-4 µg/dL)

HYPOTHYROIDISM

* NTI = nonthyroidal illness
** All test results can be affected by NTI and concurrent drug therapies, especially phenobarbital, sulfa antibiotics and immunosuppressive doses of corticosteroids.

COMMON THYROID VALUES

The values below are listed in micrograms/dL (µg/dL). VALUES VARY BY LAB METHOD AND CHANGE OVER TIME. CHECK CURRENT SOURCES FOR ACCURACY. THERAPEUTIC RESULTS LISTED ARE FOR 4-6 HOUR POST PILL ASSESSMENT.

REFERENCE LABORATORY:
Idexx = Diagnosis: Low < 1, normal 1-4, increased > 4
Therapeutic: 2.1-5.4
Antech = Diagnosis: suspicious < 1, normal 2-4, unlikely > 4
Therapeutic: 2.5-5.0
Abaxis AVRL = Diagnosis: Normal 0.5-3.4
Therapeutic: 2.4-4.4

IN-HOUSE:
Idexx Snap T4 = Diagnosis: Low < 0.8, borderline 0.8-1.5, normal 1.6-5.0, increased > 5
Therapeutic: 2.1-5.4
Abaxis Vetscan = Diagnosis: Normal 1.1-4.0
Therapeutic: 3.0-5.0

Levocrine™ Chewable Tablets (levothyroxine sodium)

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LEVOCRINE™ Chewable Tablets
(levothyroxine sodium)

CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION: Each LEVOCRINE Chewable Tablet (levothyroxine sodium) provides synthetic crystalline levothyroxine sodium (L-Thyroxine). The structural formula for levothyroxine sodium is:

![Chemical Structure of Levothyroxine Sodium]

LEVOTHYROXINE SODIUM ACTION: Levothyroxine sodium acts, as does endogenous thyroid hormone, to stimulate metabolism, growth, development and differentiation of tissues. It increases the rate of energy exchange and increases the maturation rate of the epiphyses. Levothyroxine sodium is absorbed rapidly from the gastrointestinal tract after oral administration. Following absorption, the compound becomes bound to the serum alpha globulin fraction. For purposes of comparison, 0.1 mg of levothyroxine sodium elicits a clinical response approximately equal to that produced by one grain (65 mg) of desiccated thyroid.

INDICATIONS: Provides thyroid replacement therapy in all conditions of inadequate production of thyroid hormones. Hypothyroidism is the generalized metabolic disease resulting from deficiency of the thyroid hormones levothyroxine (T4) and liothryronine (T3). LEVOCRINE Chewable Tablets (levothyroxine sodium) will provide levothyroxine (T4) as a substrate for the physiologic deiondination to liothryronine (T3). Administration of levothyroxine sodium alone will result in complete physiologic thyroid replacement. Canine hypothyroidism is usually primary, i.e., due to atrophy of the thyroid gland.

In the majority of the cases the atrophy is associated with lymphocytic thyroiditis and in the remainder it is non-inflammatory and as of yet unknown etiology. Less than 10 percent of cases of hypothyroidism are secondary, i.e., due to deficiency of thyroid stimulating hormone (TSH). TSH deficiency may occur as a component of congenital hypopituitarism or as an acquired disorder in adult dogs, in which case it is invariably due to the growth of a pituitary tumor.

HYPOTHYROIDISM IN THE DOG: Hypothyroidism usually occurs in middle-aged and older dogs although the condition will sometimes be seen in younger dogs of the larger breeds. Neutered animals of either sex are also frequently affected, regardless of age. The following are clinical signs of hypothyroidism in dogs:
- Lethargy, lack of endurance, increased sleeping
- Reduced interest, alertness and excitability
- Slow heart rate, weak apex beat and pulse, low voltage on ECG
- Preference for warmth, low body temperature, cool skin
- Increased body weight
- Stiff and slow movements, dragging of front feet
- Head tilt, disturbed balance, unilateral facial paralysis
- Atrophy of epidermis, thickening of dermis
- Surface and follicular hyperkeratosis, pigmentation
- Puffy face, blepharoptosis, tragic expression
- Dry, coarse, sparse coat, slow regrowth after clipping
- Retarded turnover of hair (carpet coat of boxers)
- Shortening or absence of estrus, lack of libido
- Dry feces, occasional diarrhea
- Hypercholesterolemia
- Normochromic, normocytic anemia
- Elevated serum creatinine phosphokinase

CONTRAINdications: Levothyroxine sodium therapy is contraindicated in thyrotoxicosis, acute myocardial infarction and uncorrected adrenal insufficiency. Use in pregnant bitches has not been evaluated.

PRECAUTIONS: The effects of levothyroxine sodium therapy are slow in being manifested. Overdosage of any thyroid drug may produce the signs and symptoms of thyrotoxicosis including, but not limited to: polydipsia, polyuria, polyphagia, reduced heat tolerance and hyperactivity or personality change. Administer with caution to animals with clinically significant heart disease, hypertension or other complications for which a sharply increased metabolic rate might prove hazardous.

ADVERSE REACTIONS: There are no particular adverse reactions associated with levothyroxine sodium therapy at the recommended dosage levels. Overdosage will result in the signs of thyrotoxicosis listed above under precautions.

DOSEAGE: The initial recommended dose is 0.1 mg/10 lb. (4.5 kg) body weight twice daily. Dosage is then adjusted by monitoring the thyroid blood levels of the dog every four weeks until an adequate maintenance dose is established. The usual maintenance dose is 0.1 mg/10 lb. (4.5 kg) once daily.

ADMINISTRATION: LEVOCRINE Chewable Tablets (levothyroxine sodium) may be administered orally or placed in the food.

DOSEAGE FORMS AVAILABLE: 0.1 mg, 0.2 mg, 0.3 mg, 0.4 mg, 0.5 mg, 0.6 mg, 0.7 mg, 0.8 mg and 1.0 mg tablets in bottles of 180 and 1,000.

STORAGE: Store at controlled room temperature 20°C to 25°C (68°F to 77°F).

REFERENCES:

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