

# Canine Hypothyroidism

*A PowerPage Presented By*



Hypothyroidism is common in older dogs but can be congenital (cretinism) in rare cases. On a board exam, you should be able to recognize the signs of hypothyroidism in dogs, choose appropriate diagnostic tests, and know about the treatment. This PowerPage highlights those key aspects of this disease.

## Key Points

- Key clinical signs include weight gain, lethargy, alopecia, pyoderma, and other skin changes
- Diagnostic screening is typically performed with basal T4 levels but should often be confirmed with additional endocrine tests
- Treatment is with synthetic thyroid hormone (levothyroxine) orally

## Relevant Pathophysiology

Hypothyroidism most commonly occurs in dogs due to lymphocytic thyroiditis. The most common cause of misdiagnosis is suppressed hypothalamic-pituitary stimulation of the thyroid due to illness (euthyroid sick syndrome). The thyroid gland synthesizes the thyroid hormones thyroxine (T4) and triiodothyronine (T3) which incorporate iodine. The hormones are responsible for a wide range of physiologic effects but most importantly, they increase metabolic rate, oxygen consumption, heart rate, erythropoiesis, and catecholamine response. They have catabolic effects on muscle and adipose tissue.

## Clinical Signs

- **Weight gain, obesity**
- **Lethargy**
- **Alopecia** – often bilaterally symmetric over the lateral trunk, tail, and ventral thorax
- Pyoderma, hyperkeratosis, seborrhea, hyperpigmentation
- Bradycardia, weak pulses, low voltage ECG complexes

## Diagnosis

- Common abnormalities on routine bloodwork and diagnostics include:
  - Mild non-regenerative anemia
  - Hypercholesterolemia
- Serum total T4 level is the preferred screening test for hypothyroidism (normal ranges vary by lab)
- Dogs with normal T4 levels are not hypothyroid; dogs with low T4 levels may be hypothyroid but this should be confirmed by at least one of the following:
  - Treat any identified underlying conditions
  - cTSH and free T4 by equilibrium dialysis levels
    - Hypothyroid dogs should have increased cTSH and low free T4
  - TSH stimulation test
    - Hypothyroid dogs should have low T4, even after TSH stimulation
  - Trial of T4 replacement therapy and assess response

## Treatment

- Oral administration of L-thyroxine
  - Optimal dosing varies among dogs and T4 levels should be evaluated after beginning therapy and while treatment is maintained

## References and Links

Ettinger, Feldman- Veterinary Internal Medicine 3rd ed pp 1419-1429

### VIN Conference Proceedings:

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