

A veterinarian in a white coat is examining a ginger cat on a table in a clinical setting. The veterinarian is leaning over the table, looking at the cat. The background is a bright, modern veterinary clinic with large windows and white walls.

Diagnosing Hyperthyroidism in Cats — Ascent Diagnostic Module

Hyperthyroidism is the most common endocrine disease in cats, particularly those over 8 years of age. Caused by excessive production of thyroid hormones (T4 and T3), it creates a state of increased metabolism that affects nearly every organ system. This module gives you a step-by-step, repeatable approach for diagnosing feline hyperthyroidism confidently.

Learning Outcomes

Clinical Recognition

Identify classic clinical signs of hyperthyroidism (weight loss despite polyphagia, hyperactivity, tachycardia, vomiting/diarrhea)

Laboratory Interpretation

Interpret a minimum database including Total T4, Free T4, TSH, and routine bloodwork

Diagnostic Algorithm

Apply the AAHA/AAFP categorical approach to diagnosis based on clinical presentation

Thyroid Palpation

Perform cervical palpation to detect thyroid nodules (thyroid slip technique)

Comorbidity Assessment

Recognize concurrent conditions (CKD masked by hyperthyroidism, hypertension, cardiac disease)

Treatment Options

Understand the four treatment modalities: radioactive iodine, surgery, methimazole, and dietary iodine restriction

Client Education

Build a client-friendly explanation of hyperthyroidism and treatment expectations

Feline Hyperthyroidism Diagnostic Flowchart

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HISTORY & EXAM

- Weight loss despite good/increased appetite
- Hyperactivity, restlessness, vocalization
- Tachycardia (HR > 220 bpm)
- Vomiting / diarrhea
- Polydipsia / polyuria
- Palpable thyroid nodule ("thyroid slip")
- Poor coat / unkempt appearance

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CLASSIC LAB PATTERN

- ↑ Total T4 (> 4.0 µg/dL)
- ↑ ALT / ↑ ALP (mild–moderate elevations)
- ↑ Heart rate / cardiac changes
- Mild erythrocytosis (stress erythrocytosis)
- USG may be dilute
- BUN/creatinine may be low-normal (hyperfiltration)

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ADVANCED DIAGNOSTICS

- Free T4 by equilibrium dialysis
- TSH (< 0.03 ng/mL supports diagnosis)
- Thyroid scintigraphy (technetium-99m)
- Cervical ultrasound
- Echocardiography if cardiac signs present

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MINIMUM DATABASE

- Total T4 (first-line screening test)
- CBC
- Chemistry (BUN, creatinine, ALT, ALP)
- Urinalysis (USG)
- Blood pressure
- ± Free T4 (if T4 equivocal)
- ± TSH (if T4 equivocal)

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AAHA/AAFP DIAGNOSTIC GROUPS

- Group 1: Classic — elevated T4 + clinical signs
- Group 2: Subclinical — elevated T4, no clinical signs
- Group 3: Suspected — clinical signs, normal T4
- Group 4: Occult — clinical signs, normal T4, low TSH
- Group 5: Sick euthyroid — concurrent illness suppressing T4
- Group 6: Equivocal — borderline T4, unclear picture

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CONFIRM DIAGNOSIS

Hyperthyroidism = elevated T4 (or Free T4) + consistent clinical signs ± palpable nodule ± suppressed TSH

Case Study

Patient History

12-year-old neutered male domestic shorthair. Owner reports 2 kg weight loss over 3 months despite ravenous appetite, increased vocalization at night, intermittent vomiting, and increased water intake.

Physical Exam

- Thin body condition (BCS 4/9)
- Heart rate 260 bpm, gallop rhythm
- Palpable thyroid nodule on left (thyroid slip)
- Mild muscle wasting
- Hyperactive, difficult to restrain
- Mild systolic murmur (grade II/VI)

Labwork

Chem:

- Total T4 = 12.8 $\mu\text{g/dL}$ ($\uparrow\uparrow$)
- ALT = 198 U/L (\uparrow)
- ALP = 112 U/L (\uparrow)
- BUN = 22 mg/dL (normal)
- Creatinine = 1.1 mg/dL (normal)

Additional:

- CBC: mild erythrocytosis (PCV 52%)
- USG = 1.028
- BP = 185 mmHg (hypertensive)
- TSH = < 0.03 ng/mL (suppressed)

Tap to Reveal Diagnosis

Classic feline hyperthyroidism (AAHA Group 1). Concurrent hypertension and thyrotoxic cardiomyopathy. Note: BUN/creatinine are low-normal — must reassess renal function after treatment (masked CKD risk).

The Hyperthyroidism–CKD Connection

Hyperthyroidism increases glomerular filtration rate (GFR), which can mask concurrent chronic kidney disease. BUN and creatinine may appear normal or low-normal in hyperthyroid cats. Always reassess renal function 2–4 weeks after initiating treatment.



Before Treatment

- ↑ GFR from hyperthyroid state
- BUN/creatinine appear normal
- Kidneys seem to function well
- True renal status is hidden
- Urine may appear concentrated

After Treatment

- GFR normalizes (decreases)
- BUN/creatinine may rise significantly
- Underlying CKD may be unmasked
- 15–40% of cats develop azotemia post-treatment
- Monitor closely at 2–4 week recheck

When Total T4 Is Normal but Suspicion Is High

Up to 10% of hyperthyroid cats have a Total T4 within the reference range at initial testing. This can occur due to early/mild disease, non-thyroidal illness suppressing T4, or fluctuating hormone levels. Next steps when T4 is normal but clinical signs are suggestive:

Repeat Total T4 in 2–4 Weeks

T4 levels fluctuate; a single normal result does not rule out hyperthyroidism. Serial testing improves sensitivity.

Free T4 by Equilibrium Dialysis

More sensitive than Total T4 but less specific. Elevated Free T4 + clinical signs supports diagnosis. Can be falsely elevated in non-thyroidal illness.

TSH Measurement

Feline TSH < 0.03 ng/mL is suppressed and supports hyperthyroidism even when T4 is normal. Combines well with Free T4 for occult cases.

Thyroid Scintigraphy

Gold standard for confirming diagnosis and localizing abnormal tissue. Especially useful for ectopic thyroid tissue or equivocal lab results.

Treatment Options at a Glance

Four treatment modalities exist for feline hyperthyroidism. Choice depends on patient factors, owner preferences, and availability:

Radioactive Iodine (^{131}I)

Gold standard. Single injection cures 95% of cases. Requires specialized facility and 1–2 week hospitalization. No daily medication needed.

Methimazole / Carbimazole

Anti-thyroid medication (oral, transdermal, or compounded). Reversible — does not cure disease. Requires lifelong administration and monitoring for side effects (GI upset, facial excoriation, hepatotoxicity, bone marrow suppression).

Thyroidectomy

Surgical removal of affected thyroid tissue. Curative but carries anesthetic risk in older cats. Risk of hypoparathyroidism (hypocalcemia) if both glands removed. Stabilize with methimazole first.

Prescription Iodine-Restricted Diet (Hill's y/d)

Limits dietary iodine to reduce thyroid hormone production. Must be sole diet — no treats, hunting, or other food. Efficacy varies; best for cats that cannot tolerate other options.

- ☐ All cats should have renal function reassessed 2–4 weeks after initiating any treatment, as masked CKD may become apparent when GFR normalizes.

Monitoring Protocol (After Treatment Initiation)

2–4 Week Recheck

- Total T4
- BUN, creatinine (critical — assess for masked CKD)
- Electrolytes
- Blood pressure
- Weight / body condition
- If on methimazole: CBC (check for bone marrow suppression)
- Assess for medication side effects (GI signs, facial pruritus)

3-Month Recheck

- Total T4
- Full chemistry panel
- CBC
- Urinalysis
- Blood pressure
- Weight / body condition
- Reassess medication dose or treatment efficacy
- Cardiac reassessment if previously abnormal

Long-Term Monitoring (Every 3–6 Months)

- Total T4 (goal: low-normal range, 1.0–2.5 $\mu\text{g/dL}$)
- Chemistry + CBC
- Urinalysis
- Blood pressure
- Weight / body condition / muscle mass
- Monitor for iatrogenic hypothyroidism (T4 too low, lethargy, weight gain)
- Adjust therapy as needed
- Renal function trending over time

Client Communication Script

Use this to model clear, supportive dialogue:



Based on your cat's symptoms and blood tests, we've diagnosed hyperthyroidism — his thyroid gland is overactive and producing too much hormone. That's why he's been losing weight even though he's eating well, and why he seems so restless. The good news is that hyperthyroidism is very treatable. We have several options, including medication, a special diet, surgery, or a one-time radioactive iodine treatment that can cure it. One important thing — hyperthyroidism can sometimes hide kidney problems by making the kidneys work overtime. So after we start treatment, we'll recheck his bloodwork in a few weeks to make sure his kidneys are doing well too. We'll find the best plan for him and for your family, and we'll monitor him closely to keep him feeling his best.

Key Takeaways



Total T4 Is the First-Line Screening Test

Elevated Total T4 + consistent clinical signs = diagnosis in most cases (AAHA Group 1)



Normal T4 Doesn't Rule It Out

Up to 10% of hyperthyroid cats have normal T4 — use Free T4, TSH, or scintigraphy for occult cases



Always Reassess Renal Function Post-Treatment

15–40% of cats develop azotemia after treatment — hyperthyroidism masks CKD by increasing GFR



Four Treatment Options Exist

Radioactive iodine (gold standard), methimazole, thyroidectomy, and iodine-restricted diet — tailor to the patient



Communicate the CKD Connection

Prepare clients that kidney values may change after treatment — this is expected and manageable with monitoring