New diagnosis of hyperthyroidism in primary care

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What you need to know
When hyperthyroidism is identified, arrange initial investigations including thyroid auto-antibodies, and offer referral for endocrinology assessment. Pending specialist review, offer beta blockers to manage adrenergic symptoms. If symptomatic and a non-transient cause is likely, start anti-thyroid drugs and recheck thyroid function tests after 2-4 weeks. Avoid pregnancy until normal thyroid function is restored.

A 36 year old woman presents to her GP with a six week history of palpitations, agitation, and unintentional weight loss of 12 kg over four months. She initially attributed her symptoms to stress relating to work pressures and a recent house move. Blood tests are arranged, which show a fully suppressed thyroid stimulating hormone (TSH) of <0.01 mU/L and free thyroxine of 86.1 pmol/L.

Hyperthyroidism describes excess hormone production from the thyroid gland. Thyrotoxicosis is the clinical state arising from excess circulating thyroid hormones due to any cause, including hyperthyroidism (fig 1).

Hyperthyroidism is a biochemical diagnosis. Establishing the underlying aetiology is essential to determine appropriate management.

Overall population prevalence of hyperthyroidism is 0.3%-2% and annual incidence is 0.1-4 per 1000.1,2 Graves’ disease accounts for up to 80% of cases, with peak incidence at age 30-50 (F:M 10:1). In older adults, toxic adenoma/multinodular goitre are responsible for a higher proportion of cases.

This article describes the first reasonable steps in diagnosing and managing hyperthyroidism for non-specialists in primary care.

What you should cover

Try to establish the likely cause. It is clinically relevant to distinguish between:

- Transient causes of thyrotoxicosis, such as thyroiditis, which typically require no specific treatment;
- Non-transient causes, principally Graves’ disease and toxic adenoma/multinodular goitre; and
- Exogenous causes, due to the drugs listed in figure 1.

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Fever and neck pain/tenderness suggest thyroiditis. Personal/family history of autoimmune disease increases the likelihood of Graves’ disease. Smoking increases the risk of Graves’ and thyroid eye disease. Exogenous causes of thyroiditis include recent iodinated radiological contrast, intentional or unintentional thyroid hormone use (e.g. as a component of weight loss supplements), and over-the-counter supplements that contain iodine (e.g. kelp). Increasingly, new pharmacological agents, including antiretrovirals (non-nucleoside reverse-transcriptase inhibitors, protease inhibitors) and cancer immunotherapy drugs are seen to precipitate thyroiditis. Pregnancy within the last six months suggests postpartum thyroiditis, a common and self-limiting condition for which anti-thyroid drugs are not indicated. Risk of relapse of Graves’ disease is also higher postpartum.

- Discuss plans for and risks associated with pregnancy in women of childbearing age. Active thyroiditis confers a higher risk of miscarriage, pre-eclampsia, intrauterine growth restriction, preterm labour, and stillbirth. Pregnancy also influences treatment choice.
- If the patient raises concerns about thyroid cancer, it is generally appropriate to offer reassurance that malignancy is exceedingly uncommon in functional thyroid nodules, i.e., those that release excess thyroid hormone to cause thyrotoxicosis.

**What you should do**

**Assessment**

Assess for complications of thyrotoxicosis (box 1). Document pulse, blood pressure, and temperature. Assess for atrial fibrillation, signs of fluid overload or heart failure, goitre, clinically evident thyroid nodules, and stigmata of Graves’ disease, including orbitopathy.

Repeat thyroid function tests (including fT4 and fT3, if initial fT4 was normal) along with thyroid stimulating hormone receptor antibodies (TRAbs). TRAbs are 98% sensitive and 99% specific for Graves’ disease; other autoantibodies (anti-thyroid peroxidase, thyroglobulin) are non-specific and less helpful. Baseline full blood count and liver function tests will be needed if anti-thyroid drugs are commenced.

**Thyroiditis**—Inflammatory markers (C reactive protein/erythrocyte sedimentation rate) are useful if thyroiditis is suspected.

**Goitre**—Arrange thyroid ultrasound ahead of secondary care review if a large goitre is identified on examination. Further investigation of nodules does not need to be arranged before referring to secondary care unless there are specific features suspicious for malignancy (rapidly enlarging nodule, cervical lymphadenopathy, hoarseness/voice changes).4

**Management**

Offer referral to an endocrinologist for all patients with newly diagnosed hyperthyroidism for confirmation of the underlying cause, further investigation as necessary, and to recommend a management plan.

For women of childbearing age, discuss and offer reliable contraception to avoid until thyrotoxicosis is controlled.

**Reduce symptoms of thyrotoxicosis**—Prescribe β blockers for rate control in patients with tachycardia.

**Offer to prescribe anti-thyroid drugs** (box 4) in patients who have a likely non-transient cause of hyperthyroidism and:

- Free thyroid hormones elevated above the upper limit of the local reference range; and
- Symptoms uncontrolled despite β blockers.

In older patients or those with underlying cardiac disease, there is a high risk of decompensation precipitated by thyrotoxicosis. Consider anti-thyroid drug treatment even if symptoms are minimal or thyroid hormones are not markedly elevated. Typically, high initial doses of carbimazole, eg, 30–40 mg daily, are introduced where thyroid hormone levels are markedly elevated (fT4 >40 pmol/L), and down-titrated depending on biochemical and symptomatic response. Lower doses, eg, 10–25 mg daily, can be considered if the thyroid hormone levels are less markedly elevated (fT4 25–40 pmol/L). Propylthiouracil is not typically first line treatment in primary care because of a small risk of severe liver injury (1 in 10 000...
patients), but can be considered if there is a history of adverse reaction to carbimazole, or in women who are currently pregnant or considering pregnancy in the near future. Seek specialist advice in such cases.

Arrange review with repeat thyroid function tests in 2-4 weeks if anti-thyroid drugs have been started, or if the patient is at high risk of decompensation. Otherwise, monitor thyroid function every 4-6 weeks while awaiting specialist review.6

**Ongoing treatment (box 5)—** If Graves’ disease is confirmed, anti-thyroid drugs are continued for 12-18 months, during which time the underlying autoimmune activity settles in about half of cases. Radioactive iodine or thyroidectomy constitute definitive treatment in toxic adenoma/multinodular goitre or persistent thyrotoxicosis in Graves’ disease after withdrawal of anti-thyroid drugs. Thyroiditis generally requires no specific treatment, but monitoring of thyroid function tests is recommended until results normalise.

### Box 5: What happens in secondary care

- In the absence of thyroid stimulating hormone receptor antibodies, thyroid scintigraphy (radionuclide uptake scanning) and ultrasound or colour-flow Doppler may provide useful information about aetiology, eg, toxic adenoma or multinodular goitre.
- Anti-thyroid drugs, radioactive iodine, and/or (sub)total thyroidectomy are the principal approaches to management. Choice of approach depends on the underlying aetiology, clinical factors, and patient preference.
- Follow-up continues in secondary care until treatment is complete and the patient is stable, ie, after resolution of thyroiditis, one year of remission in Graves’ disease, or once thyroid function is stable following radioactive iodine or surgery.
- At discharge, patients receive guidance about ongoing frequency of thyroid function monitoring in primary care.
- Lifelong monitoring in primary care is recommended for patients with Graves’ disease on account of the risk of relapse.

**Eye symptoms—** Discuss thyroid eye disease with patients with suspected Graves’ disease. If features of eye disease are present (gritminess, epiphora, proptosis, lid swelling, visual blurring), prescribe simple ocular lubricants (eg, hyromellose) and arrange early ophthalmology referral, preferably to a specialist thyroid eye disease clinic. Graves’ orbitopathy can occur in the context of hyper-, hypo-, or euthyroidism, and may precede onset of abnormal thyroid function. Various symptom severity scores may aid assessment of Graves’ orbitopathy (eg, DiaGO, CAS/EUGOGO, box 6).8 Refer urgently to ophthalmology if sight threatening complications are suspected: corneal exposure (cornea/sclera visible with eyes closed), globe subluxation (restricted eye movements), or optic neuropathy (deterioration in visual acuity or colour discrimination).

### Box 6: Resources for clinicians

**Thyroid eye disease assessment tools:**


Strongly advise smoking cessation if applicable. Evidence supports the use of selenium 100 μg twice daily, which can be purchased over the counter, to slow disease progression and improve quality of life in mild thyroid eye disease.10

**Thyrotoxic crisis (‘thyroid storm’)**—Though very rarely seen in primary care, this is a medical emergency. Consider the diagnosis if the patient appears acutely unwell, agitated, febrile, or has features of heart failure (box 1). The Burch-Wartofsky score (box 6) is a useful assessment tool. If suspected, arrange immediate admission for medical assessment.

**Education into practice**

- How might this article encourage you to adapt your first consultations with patients with a new diagnosis of hyperthyroidism?
- How do you routinely discuss the risks of pregnancy in women of childbearing age with thyrotoxicosis?
- How comfortable do you feel to start treatment with anti-thyroid drugs as a non-specialist?

**Patient involvement**

Janis Hickey, director of the British Thyroid Foundation, provided guidance regarding the scope and content of the article. She has extensive insight into the patient experience at diagnosis and beyond through her personal experience as a patient with Graves’ and thyroid eye disease, and many years of patient advocacy.

**Contributorship statement** GB proposed authorship of the piece and developed the article overview, structure and content with a focus on the primary care setting. EK and BK provided guidance concerning treatment initiation and broader management considerations from a specialist secondary care perspective. Anh Tran, GP with a special interest in endocrinology, provided valuable perspectives on the content of the article to reflect key priorities within the GP consultation based on her extensive experience of managing thyroid disease in primary care. AT contributed to an early draft of the article but has since left the authorship team.

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Figure

**Graves' disease**
- Toxic multinodular goitre
- Solitary toxic adenoma
- Thyroiditis – subacute, de Quervain's, Hashimoto's (initial hyperthyroid phase), postpartum
- Functional thyroid carcinoma

**TSH-secreting (thrytroph) pituitary tumour**

**Thyroid hormone resistance syndrome**

**Drugs**
- Amiodarone
- Lithium
- Iodinated radiological contrast
- Interferon α
- Tyrosine kinase inhibitors
- Novel cancer immunotherapies
- Antiretrovirals – NNRTIs, PIs
- Factitious levothyroxine use
- Over-the-counter products
  - Iodine-containing supplements (e.g. kelp)
  - Thyroid hormone-containing products (e.g. weight loss supplements)

**Struma ovarii**
- Ectopic thyroid hormone secretion from ovarian teratoma with thyroid tissue differentiation

**Fig 1** Causes of thyrotoxicosis. Common causes are listed in bold.