

Thyroid disease

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James talks to Professor Ian Caterson about an approach to thyroid disease.

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About Ian Caterson

Ian Caterson is currently Foundation Director of the Boden Institute of Obesity Nutrition Exercise and Eating Disorders and Boden Professor of Human Nutrition at the University of Sydney. He has held the latter position since 1997. Prior to that, he was Senior Staff Specialist and Director of Clinical [Endocrinology](#) at Royal Prince Alfred Hospital.

He has been president of both the Australian Diabetes Society and the Australasian Society for the Study of Obesity and is president elect of the World Obesity Federation.

Ian is a recognised expert on obesity, its causes, prevention and management. He is on the Clinical Care group of World Obesity, Chairs the Expert Obesity Committee for the Australian National Preventive Health Agency and is on the Prevention and Community Health Committee of the [NHMRC](#) of Australia.

Thyroid Disease

With Professor Ian Caterson, Consultant Endocrinologist at Royal Prince Alfred Hospital, New South Wales, Australia

Introduction

Thyroid function tests are commonly ordered by junior doctors. Thyroid disease is common, and it is appropriate to order thyroid function tests in patients with known thyroid disease during a hospital admission. In clinical situations where you are worried that a patient may have hypothyroidism, hyperthyroidism, or where there is an obvious goitre, it is also appropriate to arrange thyroid function tests.

Case 1

A 40-year-old female admitted with ischaemic chest pain mentions she has gained weight and felt fatigued recently. Thyroid function tests show an elevated TSH and a low T4.



1. What is your overall approach to the assessment of this patient?

- This is a common situation, and we need to determine the cause.
- Order antithyroid antibodies - would be present in thyroiditis, of which there are three common causes:
 - Hashimoto's thyroiditis - very high levels of anti-thyroid peroxidase.
 - Acute thyroiditis - often post-viral.
 - Acute de Quervain's thyroiditis.
- Arrange a thyroid ultrasound - assess size of thyroid, and for multinodular goitre.
- Commence thyroxine.
 - Long-term hypothyroidism (classic history, and very high TSH), start with a low dose and build up; and consider adding corticosteroids in the first few weeks of therapy.
 - At the other end of the spectrum (eg. TSH 20, and a slightly low T4) start thyroxine 100 micrograms per day, then adjust the dose. Thyroxine takes three weeks to build to an appropriate level, so don't repeat TFTs too soon.

2. Outline your approach to assessment approach

- **History:**
 - Family history?
 - Where was the patient born?
 - What other symptoms does the patient have? Are they slowing down?
- **Examination:**
 - Examine for a goitre. Is it compressing the trachea? Is it extending retro-sternally?
 - Cardiac status?
 - Reflexes: are the ankle jerks hung-up?

3. How do we determine whether a patient on thyroxine is on the correct dose?

- Check free T4 and free T3 - see if this is in the normal range.
- Ask how long they've been on thyroxine. If they've taken it for many years and the TSH is suppressed, the dose should be reduced. If they've been on thyroxine for around one year and TSH is suppressed, safe to watch this.
- Note: TSH is not useful following pituitary surgery.

4. Take-home messages about hypothyroidism on the wards

- Patients with hypothyroidism can have surgery (endocrinologists are often asked about this).
- Once hypothyroidism is diagnosed, commence treatment and arrange for the patient to be reviewed in one month (by the GP or an endocrinologist).

Case 2

A 70-year-old man in ICU with severe pneumonia has thyroid function tests which show a low T3 and TSH.

1. Initial approach

- This is sick euthyroidism.
- This simply needs to be watched.

2. Management for sick euthyroidism

- Manage the underlying condition - sick euthyroidism is a response to the current illness.

Case 3

A 50-year-old woman presents to ED with palpitations and tremor. She has noticed weight loss and a swelling in her neck recently.

1. Overall approach to the assessment of this patient

- **History:**
 - Weight changes, bowel habit, weakness
 - Family history of thyroid disease
 - Palpitations, tremor
- **Examination:**

- Hands
- Eyes
- Proximal muscles
- Auscultate for a bruit over the thyroid
- Cardiac examination
- Feel for a spleen

2. Investigations for hyperthyroidism

- Thyroid function tests: TSH, free T3 and free T4.
- Consider the different causes:
 - Graves' disease - thyroid-stimulating antibodies.
 - Thyroiditis - measure anti-thyroid antibodies.
 - Autonomous nodule (e.g. in multinodular goitre) - ultrasound and scan the thyroid.
 - Rarely can be a carcinoma.
- Investigations looking for the effects of hyperthyroidism
 - ECG looking for atrial fibrillation.
 - Blood glucose level.

3. Management for hyperthyroidism

- Initial medical management of thyrotoxicosis doesn't necessarily require admission. After medication is commenced, it's important the patient is reviewed the next week to adjust doses and review symptoms. Repeat TFTs in 10-14 days, then again every 4-6 weeks once an appropriate dose is adjusted.
 - Note: after thyrotoxicosis, the TSH may take a year to come back to the normal range.
- Antithyroid drugs: neomercazole and propylthiouracil.
- Beta-blocker (usually propranolol) to control symptoms.
- Consider radioactive iodine.
- Surgical management.

4. What is a thyroid storm and who is at risk of this?

- Thyroid storm is rare, but very dangerous.

- Tends to occur in people with a history of treated thyroid disease. When they become unwell, they get a massive release of thyroxine.
- Features of severe thyrotoxicosis: hyperpyrexia, hypotension, tachyarrhythmias.
- Very dangerous when develops intra- or post-operatively.
- Management:
 - IV fluids
 - IV vitamins (hypermetabolic state)
 - Dexamethasone (stops conversion of free T4 to active T3)
 - Beta-blocker
 - Anti-thyroid medications
 - Consider Lugol's iodine - a very old treatment for hyperthyroidism.

Take home messages

- If someone is hyperthyroid, operations or procedures should be delayed until the hyperthyroidism is resolved if possible, to avoid the danger of tachyarrhythmias

Related Podcasts

- [Post-operative neck swelling](#)

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