

Investigating Thyroid Function

Case Study Feedback



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Analysis of responses from your colleagues, GP panel feedback and specialist comments.	

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Acknowledgement:

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Thyroid Function Case Study

1. A 64 year-old man has lack of energy. Direct questioning reveals cold intolerance and troublesome constipation. Hypothyroidism is part of your differential diagnosis.	TSH	
	FT4	
	FT3	
2. An 18 year-old woman has lack of energy and difficulty sleeping. She has taken the combined oral contraceptive pill for the last three years and her periods have been light all of this time. Examination is normal.	TSH	
	FT4	
	FT3	
3. A 55 year-old man has been on thyroid replacement for the last five years because of autoimmune hypothyroidism. He comes for a repeat of his medication but mentions he has had trouble losing weight recently.	TSH	
	FT4	
	FT3	
4. A 66 year-old woman has a multinodular goitre. There are no signs of hypothyroidism.	TSH	
	FT4	
	FT3	
5. A 26 year-old woman has been losing weight despite a good diet and exophthalmus is apparent on examination.	TSH	
	FT4	
	FT3	
6. A 32 year-old woman is on carbimazole for hyperthyroidism. She is attending for tailoring of her dose.	TSH	
	FT4	
	FT3	
7. A patient who has been on thyroxine for over a year attends. You are finding it difficult to stabilise their dose and you suspect erratic adherence to their medication regimen.	TSH	
	FT4	
	FT3	
8. A young woman on thyroxine comes in for her first antenatal visit.	TSH	
	FT4	
	FT3	
9. A 40 year-old man comes to see you because he is tired and having occasional dizzy spells. Despite having a good diet and regular exercise, he has gained 5 kg in the last 6 months. He reluctantly admits a drop in libido.	TSH	
	FT4	
	FT3	
10. A 35 year-old woman attends because she is tired. Otherwise she has no specific symptoms. Her mother takes pills for "thyroid problems".	TSH	
	FT4	
	FT3	

Feedback

We are sorry you did not return a case study to us. Please let us know if there is any way we can make our case studies more useful to you. We want our resources to be helpful with your day-to-day clinical practice. We would be pleased to receive any suggestions that you have.

These primary care scenarios prompt consideration of which initial test or tests of thyroid function could be used. We have recommended that:

- TSH is used as the sole test of thyroid function in most situations.
- Asymptomatic patients are not screened for thyroid dysfunction.

Panel discussion revealed that the answers are not always clear cut and this was reflected both in the results of your colleagues and the specialist comment.

If you have any questions please email these to us and we will answer via the 'Your Questions Answered' section of our web site.

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Case Study Feedback

For each scenario complete the check boxes as if they were part of your laboratory form. Check the tests (if any) that you would request for each scenario. The three blood tests are Thyroid Stimulating Hormone (TSH), Free Thyroxine (FT4) and Free Triiodothyronine (FT3).

GP Panel Discussion

Again the panel highlighted the difficulty in making choices on limited patient information. A constant theme was the importance of a good history.

1. A 64 year-old man has lack of energy. Direct questioning reveals cold intolerance and troublesome constipation. Hypothyroidism is part of your differential diagnosis.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	84%	0%	0%	10%	5%
GP panel	✓				

The panel all opted for a TSH but stress that hypothyroidism is not the only possibility. The possibilities range from depression to bowel cancer. A careful history and examination are required and investigations tailored accordingly.

I would screen for secondary as well as primary hypothyroidism in this man. The low FT4-normal TSH combo is a rare (1:20,000) but powerful screen for hypopituitarism.
- Dr Mike Croxson

2. An 18 year-old woman has lack of energy and difficulty sleeping. She has taken the combined oral contraceptive pill for the last three years and her periods have been light all of this time. Examination is normal.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	63%	0%	0%	6%	2%
GP panel	no tests				

This is a common primary care scenario. Thyroid dysfunction will be the eventual diagnosis on very few occasions. Most panel members would not test thyroid function at this time, as would 30% of your peers. Those that would test felt it would promote the therapeutic relationship by letting the woman know her problem was being taken seriously and giving a reason to come back to check progress and discuss any psychosocial

issues. Decisions to test are often determined by patient factors rather than disease-based evidence.

Agree, probably non-thyroidal - Dr Mike Croxson

3. A 55 year-old man has been on thyroid replacement for the last five years because of autoimmune hypothyroidism. He comes for a repeat of his medication but mentions he has had trouble losing weight recently.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	56%	1%	0%	32%	10%
GP panel	✓				

The panel all chose a TSH for this scenario. They were not sure what the significance was of 'his trouble losing weight recently' and would need to explore this further.

Due to 'his trouble losing weight' I would request FT4 as well as TSH, to help estimate any change indicated by a raised TSH. - Dr Mike Croxson

4. A 66 year-old woman has a multinodular goitre. There are no signs of hypothyroidism.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	70%	0%	0%	10%	12%
GP panel	✓				

All of the panel include a TSH in their work up of people presenting with goitre.

TSH only - Dr Mike Croxson

5. A 26 year-old woman has been losing weight despite a good diet and exophthalmus is apparent on examination.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH, FT4 & FT3
you					
your peers	36%	0%	0%	22%	40%
GP panel	✓	?	?		

This woman appears to be hyperthyroid. All panel members would perform a TSH. There was some discussion on whether to request the other tests, but it was decided this depended on a number of contextual issues, such as if the doctor would manage the patient themselves. Most commented that referral to a specialist clinic would result in all tests being repeated anyway.

Request TSH, however I would probably measure all 3 thyroid function tests because of the high clinical suspicion of hyperthyroidism. - Dr Mike Croxson

6. A 32 year-old woman is on carbimazole for hyperthyroidism. She is attending for tailoring of her dose.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH, FT4 & FT3
you					
your peers	22%	1%	0%	59%	14%
GP panel				✓	

The panel assumed that this woman had recently started carbimazole as she is still attending for tailoring of her dose. As TSH may remain suppressed for 3-6 months after starting therapy they would test for both TSH and FT4. Once the TSH had normalised they would test only TSH.

This situation can often be tricky. Anti-thyroid drugs tend to lower FT4 preferentially but FT3 may stay high and TSH low, this may be an indicator of the need for continuing carbimazole. I measure TSH, FT4 and FT3 usually. Also this is one situation where the TSH may lag behind true thyroid status. The other is in the first 2-3 months after iodine treatment. - Dr Mike Croxson

7. A patient who has been on thyroxine for over a year attends. You are finding it difficult to stabilise their dose and you suspect erratic adherence to their medication regimen.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	12%	0%	0%	76%	10%
GP panel				✓	

Erratic adherence to thyroid replacement therapy can produce confusing blood results. The TSH may be high because the patient has not taken thyroxine regularly but the FT4 may also be elevated because the patient has taken several catch up doses shortly before their appointment. The panel would test both TSH and FT4 in this situation.

Measure both TSH and FT4 to help predict change indicated by a high TSH. - Dr Mike Croxson

8. A young woman on thyroxine comes in for her first antenatal visit.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	8%	4%	0%	71%	12%
GP panel				✓	

Hypothyroidism during pregnancy can have adverse effects on both the mother and baby. Most women who are already on thyroxine will need a dose increase during pregnancy. In the first trimester TSH levels are suppressed by the thyroid stimulating effect of hCG. For these reasons the panel chose to test both TSH and FT4 in this scenario.

Maternal hypothyroxinaemia with values below the 10th centile of the normal range has been shown to be associated with a reduction in IQ; therefore it is important to raise the FT4 from 6 weeks gestation.

We still await the results of the UK CATS (Child Antenatal Thyroid Study) RCT. In this trial women with high TSH (> 97.5%) or low FT4 (< 2.5%) are given thyroxine or a placebo and outcomes are followed. If thyroxine therapy is shown to have an advantage, then antenatal screening is likely to be recommended in the future.

- Dr Mike Croxson

9. A 40 year-old man comes to see you because he is tired and having occasional dizzy spells. Despite having a good diet and regular exercise, he has gained 5 kg in the last 6 months. He reluctantly admits a drop in libido.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	58%	1%	0%	31%	4%
GP panel				✓	

The panel felt there was a wide differential diagnosis for this man; he has a cluster of non-specific symptoms. The possibility of central hypothyroidism raised by the dizzy spells, loss of libido and weight gain led the panel to choose both TSH and FT4 tests.

FT4 and TSH, secondary hypothyroidism with partial hypopituitarism should be considered. - Dr Mike Croxson

10. A 35 year-old woman attends because she is tired. Otherwise she has no specific symptoms. Her mother takes pills for “thyroid problems”.

	TSH alone	FT4 alone	FT3 alone	TSH & FT4	TSH,FT4 & FT3
you					
your peers	83%	0%	1%	5%	2%
GP panel	?				

The panel felt they needed more information from the patient’s history before being able to decide on testing. They acknowledged that hypothyroidism has a prevalence of 1-2% in women and the presentation is often very non-specific. They would test if the woman specifically requested it.

TSH only - Dr Mike Croxson