

## Scottish Clinical Biochemistry Network Guidance on Thyroid Testing

Routinely available biochemical tests of thyroid function include Thyroid Stimulating Hormone (TSH), free T4 (FT4) and tri-iodothyronine (T3/FT3)

Thyroid peroxidase antibody (TPOAb), Thyroid Receptor antibody (TRAb), thyroglobulin (TGL) and calcitonin are also available for testing in specific clinical situations.

Thyroid function testing is undertaken:

**1. to confirm diagnosis**

- a. primary hypothyroidism
- b. thyrotoxicosis
- c. euthyroid

**2. to monitor patients on treatment**

- a. thyroxine replacement
- b. anti-thyroid medication (carbimazole or propylthiouracil)

**3. in clinical situations to screen for thyroid disease**

- a. Patients with other autoimmune conditions e.g. type 1 diabetes mellitus
- b. Patients with Trisomy 21, Turner's syndrome
- c. Patients on drugs that may upset thyroid function e.g. lithium, amiodarone
- d. Investigation of infertility, hyperlipidaemia, osteoporosis, tachyarrhythmia
- e. Patients with goitre
- f. Patients with hyperthyroidism previously treated with radioactive iodine

#### **4. Neonatal Screening**

A review of Keele 2016-2017 data suggests that there are differences amongst laboratories in the TFT testing strategy undertaken. Ideally this should be standardised across Scotland.

All tests are available but could be selectively applied in diagnostic, screening and monitoring situations.

All patients who are pregnant or who are <16 years should have both TSH and FT4 measured.

Where TSH only is measured, there should be an opportunity for reflective addition of FT4 or T3/FT3.

Clinical Scenario		TSH	FT4	T3/FT3
To confirm diagnosis	Primary hypothyroidism	yes	yes	
	Thyrotoxicosis	yes	yes	yes
	Euthyroid	yes	yes	
To monitor patients on treatment	Thyroxine replacement – primary thyroid failure	yes		
	Thyroxine replacement – thyroid failure secondary to pituitary disease	yes	yes	
	Anti-thyroid medication (carbimazole or propylthiouracil)	yes	yes	Yes (if TSH <0.01 and FT4 within reference limits)
In clinical situations to screen for thyroid disease	Patients with other autoimmune conditions e.g. type 1 diabetes mellitus	yes		
	Patients with Trisomy 21, Turner’s syndrome	yes		
	Patients on drugs that may upset thyroid function e.g. lithium, amiodarone	yes	yes	
	Investigation of infertility	yes	yes	
	Investigation of hyperlipidaemia, osteoporosis, tachyarrhythmia	yes		
	Patients with goitre	yes		
	Patients with hyperthyroidism previously treated with radioactive iodine	yes	yes	
Neonatal Screening		yes		

### **Indications for TRAb measurement**

To investigate cause of new diagnosis of thyrotoxicosis

In pregnancy, where there is current, or history of, thyrotoxicosis

In neonates, where mother has TRAbs

### **Indications for TPOAb measurement**

To investigate cases of subclinical hypothyroidism (TSH raised with normal FT4, on two occasions, measured six months apart)

### **Indications for TGL measurement**

Follow-up monitoring of established thyroid cancer, post total thyroidectomy

Neonatal hypothyroidism

### **Indications for calcitonin measurement**

Diagnosis and monitoring of medullary carcinoma of thyroid

## **References**

### **UK Guidelines for the Use of Thyroid Function Tests 2006**

**A common finding of covert hypothyroidism at initial clinical evaluation of hyperlipidaemia C J Glueck et al Clin Chem Acta 1991; 113-122**

**Incidence of asymptomatic hypothyroidism in new referrals to hospital lipid clinic O’Kane et al ACB 1991;28:509-511**

#### **NOTE**

*This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient’s case notes at the time the relevant decision is taken.*