Guidance for Thyroid Function Testing in Primary Care in Lothian

In July 2006 following a lengthy consultation process, a joint working group comprising representatives from the Association of Clinical Biochemistry, The British Thyroid Association and British Thyroid Foundation published on the web "UK Guidelines for the Use of Thyroid Function Tests" (http://www.british-thyroid-association.org/sandbox/bta2016/uk_guidelines_for_the_use_of_thyroid_function_tests.pdf) These give guidance on the optimal use of thyroid function tests (TFTs) to diagnose and monitor thyroid disease.

The following are suggestions for the use of thyroid function tests in Primary Care and are derived from the UK guidelines, modified to take into account local practice.

PREVALENCE OF HYPOTHYROIDISM

Females

- In women, the prevalence of newly diagnosed overt hypothyroidism increases from 0.3% in younger women to 2% in women over 60 y.
- The prevalence of subclinical hypothyroidism (normal Free T4; high TSH) in women below 40y is approximately 4-6%, rising to 10-15% at 60y-75y.

Males

- In males the overall prevalence of overt hypothyroidism is low at <0.1% but for subclinical hypothyroidism the prevalence is approximately 10% when over 60y.

SCREENING AND SURVEILLANCE– who to test?

- Screening in the healthy asymptomatic population is not warranted.

Symptomatic patients: -

- Patients with features of a thyroid disorder.
- Women at the menopause, when presenting with non-specific symptoms.
- Elderly with non-specific symptoms

Surveillance of "At Risk Patients"

• Patients stabilised on T4	annual check*
• Type 1 diabetes	annual check
• Type 2 diabetes	at diagnosis; *then annually only if TSH is >2.0mU/L & TPOAb +ve*
• Treated hyperthyroidism	annual check
• Down's and Turner's syndrome	annual check
• Post – neck irradiation	annual check
• Lithium or Amiodarone	6 monthly check

* It is conventional practice to recheck TFTs on an annual basis in people on a stable dose of T4. Recent local data suggest that the frequency of monitoring can be safely reduced to 2 years in patients on a stable dose of T4, but patients should be advised to have an earlier check of TFTs if they have any symptoms suggestive of thyroid dysfunction. Women of reproductive age should continue to have an annual check of thyroid function because of the potential adverse risks of sub-optimally treated hypothyroidism in pregnancy.

HYPOTHYROIDISM – Diagnosis and when to treat
Overt Primary Hypothyroidism – (Free T4 low; TSH high - usually TSH > 20mU/L)

- Commence patient on T4 (if transient thyroiditis is excluded)

Subclinical Primary Hypothyroidism – (Free T4 normal; TSH high).
Many cases of sub-clinical hypothyroidism are transient. It is essential to confirm that abnormalities in TSH are persistent or progressive. Studies suggest that the average patient will not get any clinical benefit from T4 therapy until TSH rises above approximately 10 mU/L.

- Repeat TSH/FT4 at 3 months to exclude transient rise in TSH. Request anti-TPO antibodies to help to determine if an autoimmune process is present and help predict risk of progression to overt hypothyroidism.

If On Repeat

- **If TSH > 10 mU/L** – start on T4
- **If TSH lies between 4.5 - 10 mU/L**, annual monitoring required.
  Commence T4, when TSH subsequently becomes >10 mU/L. A trial of T4 may be warranted in a few patients eg if they are symptomatic with goitre or planning pregnancy (see below). Some endocrinologists may also commence T4 therapy if TPOAb are positive; this is because such patients have a greater risk of developing overt hypothyroidism.

T4 REPLACEMENT
Aim - to make patient feel well and restore TSH and free T4 to within reference range. In some patients free T4 may have to be above the reference range to achieve a "normal" TSH.
Some patients report they "feel better" only when T4 is given at a dose that produces a low or undetectable TSH. There have been some reports of decreased bone mineral density in postmenopausal women on T4 who have a TSH <0.1 mU/L, These studies are not conclusive and thus some endocrinologists will allow some patients to run with a low or undetectable TSH but only if T3 lies unequivocally within the reference range.

Monitoring

- The laboratory finds it helpful if the request form indicates that the patient is on T4.
- When T4 dose is changed, a period of 2-3 months should elapse before re-testing.
- When a patient is stabilised on T4, only an annual check using TSH alone is required; the laboratory will automatically perform a free T4 if TSH is abnormal. ***This is only applicable to those patients who are "stable" on thyroxine.*** If the patient's TFTs have been fluctuating or a previous test has shown an undetectable TSH, then TSH and Free T4 should be measured. Nurses leading an annual review clinic should be informed of the situations where both TSH and FT4 are required.

Medication and T4 therapy

- Some over-the counter medications can impair T4 absorption. These include:- PPIs and H_2 antagonists, calcium carbonate, soy protein, aluminium hydroxide and ferrous sulphate.
- Do not take T4 within 4 hours of taking other medication.
- The requirement for T4 is likely to increase in hypothyroid patients who become pregnant or who are commenced on anti-convulsants or oestrogen containing oral contraceptives.

T3 replacement
T3 therapy is rarely required and there is no consistent evidence to recommend the use of combined therapy with T3 and T4. The aim of T3 therapy is to normalise TSH. Measurement of Free T4 is of no value in assessing patients on T3. Serum T3 measurements are of limited value due to the variability of T3 concentrations in blood after a T3 dose.

HYPOPITUITARISM

Diagnosis Secondary hypothyroidism should be considered in patients presenting with low FT4 and normal (or only slightly raised) TSH. However a low Free T4 in the presence of a normal TSH is most commonly due to non-thyroidal illness or the use of NSAIDs, furosemide, anti-convulsants or high dose glucocorticoids. **If hypopituitarism is suspected, an endocrinologist should carry out further investigation and assess the requirement for treatment**

Monitoring T4 therapy in hypopituitarism – Specialist Care

TSH measurements are of no value in monitoring these patients. **An Endocrinologist should guide treatment and follow-up.** The aim of therapy is to maintain Free T4 in the upper third of the reference range (16-21 pmol/L).

HYPERTHYROIDISM

Diagnosis

Overt Hyperthyroidism TSH <0.01mU/L; Free T4 and/or T3 high

Refer to endocrinologist to establish diagnosis & give optimal treatment. The laboratory will automatically add on TSH-receptor antibody (TRAb) analysis in the first instance to help identify the cause.

Subclinical Hyperthyroidism – TSH <0.01 mU/L; FreeT4/T3 normal

- Exclude, moderate and severe illness (non-thyroidal illness) and drugs that suppress TSH (dopaminergic drugs, high dose glucocorticoids).

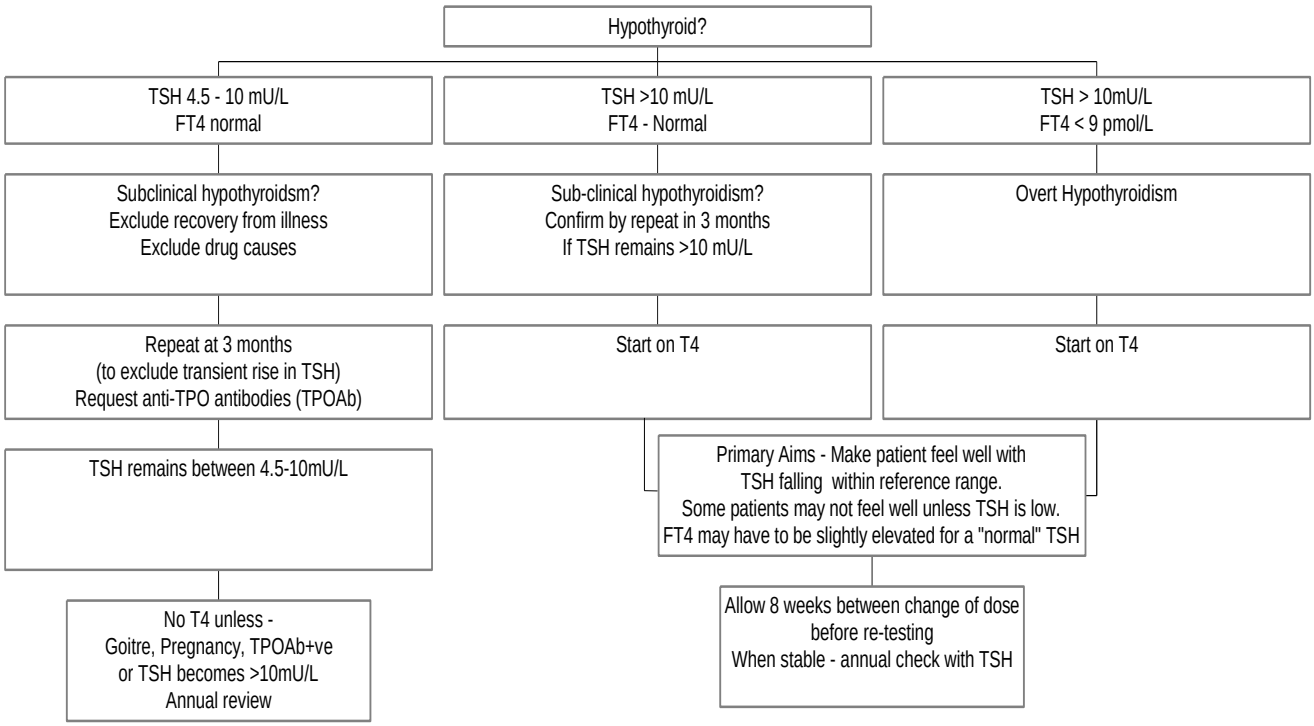
- Repeat TSH/FT4/T3 1-2 months later and request TRAb analysis if the cause of hyperthyroidism is not apparent. If abnormalities persist – refer to endocrinologist to establish diagnosis & give optimal treatment. If treatment is not undertaken, the patient should be monitored every 6-12 months.

References

The complete version of the UK Guidelines is available on the British Thyroid Association website:-
http://www.british-thyroid-association.org/sandbox/bta2016/uk_guidelines_for_the_use_of_thyroid_function_tests.pdf

Guideline published September 2008 (Dr A D Toft and Dr GJ Beckett)
Updated April 2017 (Dr M Crane, Dr S Forbes and Prof M Strachan)

Diagnosis and Management of Hypothyroidism



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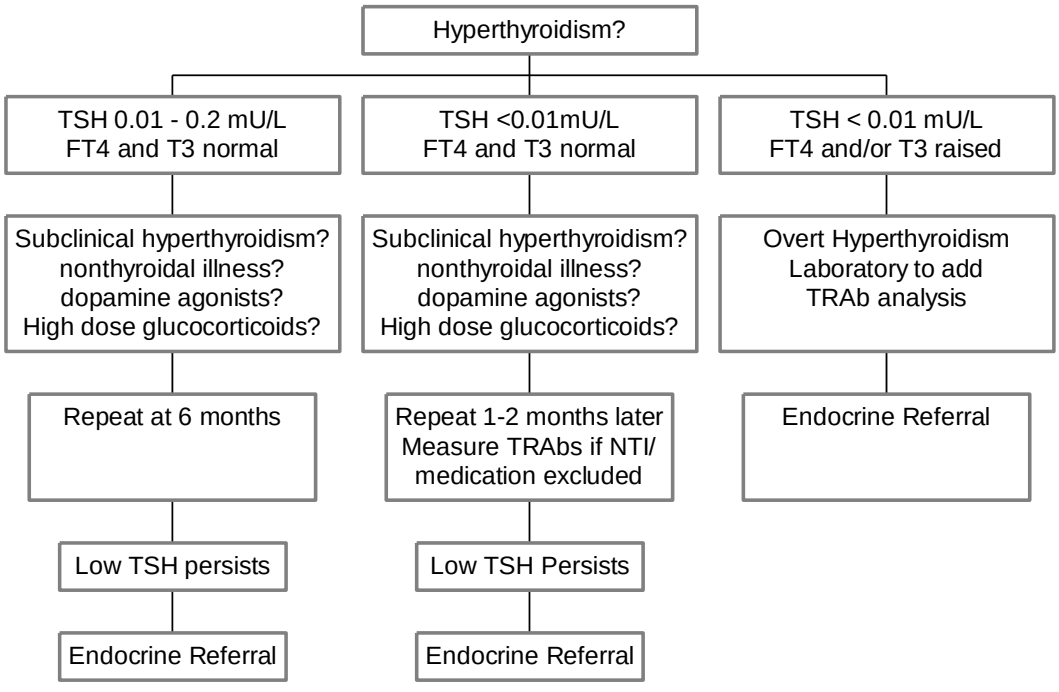

Thyroid Function Testing - Patients with Type 2 Diabetes