COMMON RESULT PATTERNS OF TFTS

THYROID STIMULATING HORMONE (TSH)

TSH is a glycoprotein which is synthesised and secreted by the thyrotrope cells in the anterior pituitary gland. It is the first-line test for the diagnosis of thyroid disease in high-risk individuals and it is the only test funded by Medicare to screen for thyroid disease when there is no history of thyroid problems. TSH can also be used to monitor patients who are receiving treatment for thyroid disease and differentiated thyroid cancer.

Common: Graves’ disease, toxic multinodular goitre, toxic adenoma.

Less Common: Early stages of Hashimoto's thyroiditis, subacute granulomatous thyroiditis, postpartum and painless forms of subacute lymphocytic thyroiditis.

Rare: Thyroxine ingestion (intentional), drug-induced e.g. iodine, amiodarone; with confirmed pregnancy e.g. hyperemesis gravidarum, hydatidiform mole.

THYROID HORMONES

TSH stimulates the thyroid gland to secrete the hormone thyroxine (T4) which is then converted to triiodothyronine (T3). T3 is the active hormone that stimulates and regulates (most) metabolism in the body. This conversion of T4 to T3 mostly takes place in end organ tissues and some in the thyroid itself.

Medicare will rebate for FT4/FT3 testing only if the clinical criteria listed in Table 1 are satisfied.

Low TSH with elevated FT4

Common: Graves’ disease, toxic multinodular goitre, toxic adenoma.

Less Common: Early stages of Hashimoto’s thyroiditis, subacute granulomatous thyroiditis, postpartum and painless forms of subacute lymphocytic thyroiditis.

Rare: Thyroxine ingestion (intentional), drug-induced e.g. iodine, amiodarone; with confirmed pregnancy e.g. hyperemesis gravidarum, hydatidiform mole.

Low TSH with normal FT4 and FT3

Common: Subclinical hyperthyroidism common in elderly patients with toxic multinodular goitre, toxic adenoma, thyroxine ingestion.

Normal or high TSH with high FT4 and FT3

Common: Hashimoto’s thyroiditis, hypothyroid phases of postpartum and painless forms of subacute lymphocytic thyroiditis, after ablative (radioiodine, subtotal thyroidectomy) therapy.

Rare: Post head and neck irradiation, drug-induced (lithium, anti-thyroid therapy, amiodarone, interferon therapy, steroid therapy, dopamine and dobutamine infusion), non-thyroidal illness.

Medicare will rebate for FT4/FT3 testing only if the clinical criteria listed in Table 1 are satisfied.
Normal or low TSH with low FT4 and FT3
This is a typical pattern seen in unwell patients with nonthyroidal illness. In otherwise healthy individuals, possible pituitary disease with secondary hypothyroidism should be considered.

FOR DIAGNOSIS
(Note: In all cases inclusion of a clinical note will allow the laboratory to perform and bill Medicare for the FT4 and FT3.)

Goitre
TSH +/- (FT3, FT4), urine iodine (note marked day to day variations), anti-thyroid peroxidase antibodies (anti-TPO Abs), anti-thyroglobulin antibodies (anti-Tg Abs), if hyperthyroid anti-TSH receptor antibodies (TRAb).

Graves’ disease
TSH +/- (FT3, FT4), anti-TSH receptor antibodies

Hypothyroidism
TSH +/- (FT4), anti-TPO Abs

Thyroiditis
(Hashimoto’s); TSH +/- (FT3, FT4), anti-TPO Abs, anti-Tg Abs (less useful)

Monitoring Levothyroxine Therapy
Levothyroxine replacement therapy in hypothyroid patients should be adjusted to maintain a normal TSH. In patients with persistent symptoms of hypothyroidism, aiming for a TSH level in the lower reference range is reasonable.

The therapeutic TSH targets in patients with differentiated thyroid cancer taking suppressive doses of thyroxine should be individualised according to the postablation risk stratification. Guidelines suggest that patients who present with high-risk disease but are clinically free of disease, are advised to maintain a TSH between 0.1 and 0.5 mU/L. For patients with persistent disease, the TSH should be kept below 0.1 mU/L.

Thyroid function tests in pregnancy
Thyroid dysfunction affects 2-3% of pregnant women and overt maternal hypothyroidism is associated with adverse pregnancy outcomes. Due to changes to thyroid physiology in pregnancy, pregnancy specific reference intervals are required to define thyroid conditions in pregnancy. It has been recommended that specialists should be involved in the management of raised TSH levels with four weekly thyroid function monitoring to 20 weeks gestation and the frequency of monitoring can decrease thereafter.

Table 2: Pregnancy specific reference intervals

<table>
<thead>
<tr>
<th></th>
<th>TSH (mU/L)</th>
<th>FT4 (pmol/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Trimester</td>
<td>0.2-2.8</td>
<td>10-21</td>
</tr>
<tr>
<td>Second Trimester</td>
<td>0.2-3.6</td>
<td>11-18</td>
</tr>
<tr>
<td>Third Trimester</td>
<td>0.2-3.6</td>
<td>9-17</td>
</tr>
</tbody>
</table>

HOW TO ORDER TSH
Requests for TSH should include clinical indicators on the request form. Please note if you only request a TSH, you will only receive a TSH result issued and no “default” TFT testing will be automatically reported for patients with an abnormal TSH. If relevant, please note all Thyroid medication.

TURNAROUND TIME
Tests are performed daily with results available the next working day.

THYROID FUNCTION TEST (TFT)
A TFT is a TSH + one, or more, of the following:
• FreeT4
• FreeT3
A TFT is recommended if the clinical conditions listed in Table 1 are suspected.

HOW TO ORDER TFT
To obtain TFT testing on the patient, the requesting doctor must submit a request that specifies “TFT” testing. If you require a TFT (TSH+T4) please specify TFT on the request form AND write one of the clinical indicators listed in Table 1 on the request form.
If you require a TSH, T4 and T3, please specify TFT+T3 on the request form AND write one of the clinical indicators listed in Table 1 on the request form.

TURNAROUND TIME
Tests are performed daily with results available the next working day.

FURTHER INFORMATION
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