## Appropriate requesting and Interpretation of thyroid function test.

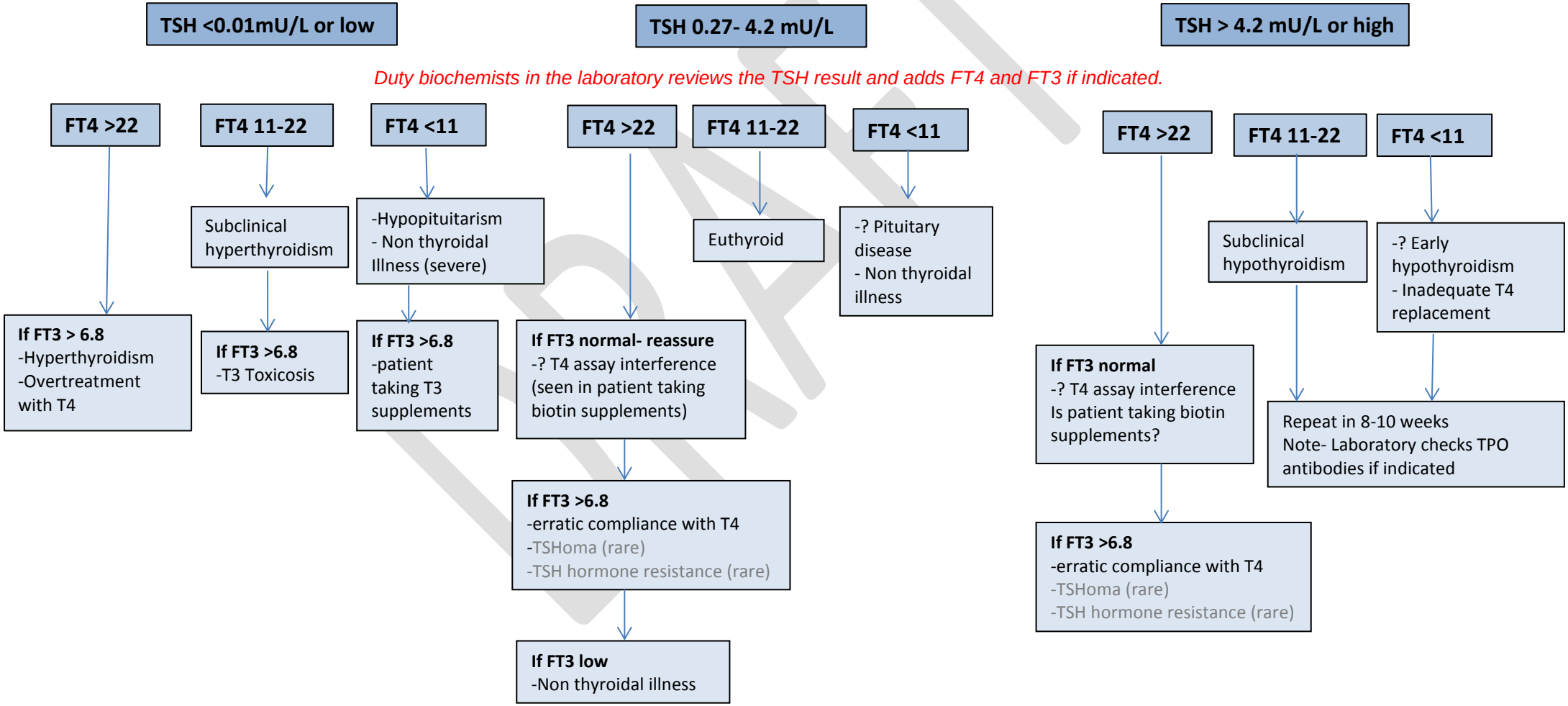
The thyroid gland produces, stores, and secretes thyroxine (T4) and triiodothyronine (T3) through a negative feedback process involving the hypothalamus and pituitary gland. Thyroid dysfunction can result when any part of this process is affected, and is usually characterised by the presence of high or low levels of thyroid-stimulating hormone (TSH, secreted by the pituitary gland) and free thyroid hormones.

- **TSH is recommended as the first line test.**
- TSH and FT4 request only if thyroid disease is suspected or in monitoring of secondary hypothyroidism.
- Avoid requesting TFT request in acutely ill patient or inpatients. Check thyroid status 6- 8 weeks after recovery from an illness.
- Only TSH result is required if monitoring patients on thyroxine for primary hypothyroidism.
- Duty Biochemists in the laboratory reviews abnormal TSH routinely and add FT4 and FT3 if indicated.
- Laboratory software rejects a repeat request for TFT or TSH if received within 21 days. If a TFT result is relevant to the current clinical condition of the patient (e.g recent commencement of treatment for thyrotoxicosis) suggest contacting duty biochemist on telephone # 772 6366.
- Thyroid receptor antibodies is valuable only in hyperthyroid patients
- Annual thyroglobulin monitoring is useful in patients with history of thyroid cancer.
- The reference range for TFTs varies slightly depending on the method of analysis used in different laboratories. We analyse TFTs on Roche immunoassay analysers at York Hospitals NHS Trust.
- **Roche method is also susceptible to FT4 assay interference if patient is taking high dose biotin supplements. FT4 result may be > 20% higher result than normal population.**
- Concomitant drug therapy with amiodarone, lithium, beta blocker, steroids, NSAIDs, antiepleptics interferes with thyroid hormone production and binding with transport proteins (e.g thyroid binding globulin).
- **Roche reference range-**

  TSH 0.27-4.20 mU/L
  FT4 11-22 pmol/L
  FT3 adults > 20 years: 3.1-6.8 pmol/L
  12 Years – 20 years: 3.9 – 7.7 pmol/L

**Interpretation of thyroid function test results.**

*(This pathway is not appropriate if the patient is pregnant or if taking amiodarone/ lithium).*




** High does biotin supplements can interfere with TSH and FT4 measurement.