

TRH Test

Test Name: CHILD THYROTROPIN STIMULATION DFT

Principle

TRH is used to stimulate the pituitary gland in order to assess the hypothalamic-pituitary-thyroid axis.

Indication

- The TRH test is used in the investigation of secondary hypothyroidism and allows for differential diagnosis of pituitary and hypothalamic causes of TSH deficiency.

Precautions

- Patients should be off thyroxine for 3 weeks prior to test, so it is rarely used in children on thyroxine.

Side Effects

- There are a number of reports in the literature of apoplexy post TRH in patients with pituitary adenoma. This is very rare, but patients should be counselled to contact the endocrine team if headaches or illness occur post-test.
- The test may cause mild flushing, nausea, headaches, abdominal and chest discomfort and a desire to micturate. Symptoms are usually seen at the time of injection.

Preparation

- Patient does not need to be fasted (unless combined with a test of GH secretion).
- Asthmatic patients should be carefully monitored throughout the test.
- As TRH may cause patients a desire to micturate, older children should be asked to empty their bladder before the test commences.
- Order the TRH (protirelin) from pharmacy at least 24 hours in advance.
- This test can be done in conjunction with other pituitary function testing. See **Combined test of anterior pituitary function**.

Protocol

- Insert an indwelling cannula and take baseline bloods for TSH and free T4 (t = 0).
- Inject protirelin (TRH) slowly i.v. over 2 minutes.** This should be completed whilst the patient is supine as side effects are most likely to occur during this period of time.

Generic	Route	Dose	Frequency
Protirelin (TRH)	<i>i.v</i>	5 micrograms/kg (to a maximum of 200 micrograms)	<i>Bolus</i>

- Take further blood samples for TSH and fT4 20 and 60 min following the administration of TRH.

Time Points:

Time post TRH infusion (min)	Blood Sample
0	TSH, fT4
20	TSH
60	TSH

Samples

TSH and fT4 1.2 mL lithium heparin blood (orange top)

Interpretation

- A normal response is a TSH peak of 10 – 30 mU/L at 20 min, which will decrease by 60 min.
- An exaggerated response is often seen if basal TSH is elevated (BUT the test should only be used to investigate secondary hypothyroidism).
- In pituitary disease, TSH response is poor.
- A hypothalamic response is indicated by a peak at 20 min which remains elevated at 60 min.
- In both pituitary and hypothalamic types of TRH response, a low fT4 value may indicate need for replacement.

References

1. Ergür A.T., Evliyaoğlu O., Şıklar Z., Bilir P., Öcal G. & Berberoğlu M. (2011) Evaluation of thyroid functions with respect to iodine status and TRH test in chronic autoimmune thyroiditis. *J Clin Res Ped Endo* **3**(1): 18 – 21