

## SHORT SYNACTHEN TEST

### INTRODUCTION

Tetracosactrin (Synacthen, Cortrosyn) is a synthetic preparation comprising the first 24 amino acids of ACTH. It stimulates the adrenal cortex to produce cortisol; failure to respond to it indicates impaired adrenocortical function. Therefore this test is of value in patients with suspected adrenocortical insufficiency eg. Addison's disease. With basal ACTH measurement it is useful in differentiating primary from secondary insufficiency and also during the later stages of withdrawal and following total cessation of previous long-term high dose glucocorticoid drug therapy, including topical preparations.

### CONTRAINDICATIONS AND SIDE EFFECTS

Allergic reactions to tetracosactrin are a possibility, but rarely occur.

### PATIENT PREPARATION

This test should be used as an out-patient screening procedure, although it can be done for in-patients presenting acutely with suspected adrenal failure.

This test should be carried out between 9am and 10am, where practical, as responses will decline later in the day. The patient should rest for 30 minutes prior to the test. Smoking is not permitted.

Oestrogens (e.g. pregnancy, HRT or COC) may induce cortisol binding protein and artefactually increase total cortisol levels. Stop all oral oestrogen therapy 6 weeks prior to test.

### Patients on therapeutic steroids

The cortisol assay is interfered with by therapeutic glucocorticoids (prednisolone / methyl-prednisolone / hydrocortisone). Therapy with such steroids should be discontinued and substituted with an alternative steroid (e.g. dexamethasone, betamethasone) at an equivalent dose (see BNF section 6.3.2) at least 3 days before the test. Alternatively, glucocorticoids should be stopped for 18 hours prior to the test. **Caution: withdrawal of glucocorticoids may be dangerous.**

### PROTOCOL

1. Take basal venous blood sample (5ml SST tube – yellow top)  
An additional sample for ACTH may also be collected for storage, pending results of the Synacthen test (5ml EDTA tube - purple top) but **must** be sent to Biochemistry immediately.
2. 250ug of Tetracosactrin dissolved in about 1ml of sterile water or isotonic saline is administered intramuscularly (adults only, for children refer to paediatric protocol).  
(Tetracosactrin is marketed as Synacthen (Ciba) for Cortrosyn (Organon)).
3. After 30 minutes a further blood sample is taken (6ml SST tube – yellow top).
4. A sample taken at 60 minutes post Synacthen is not recommended, unless the test is being performed in the afternoon or evening.

Label the samples with patient details and actual time taken. When the test is complete, send request form and samples to the Clinical Biochemistry Department as soon as possible.

### **INTERPRETATION**

For 30 minute sample levels:

**>450 nmol/L at 30 minutes:** Suggests intact HPA axis and unlikely to be associated with adrenocortical insufficiency. (Note that previous criteria suggesting an increment in serum cortisol are invalid, normal individuals who have a high basal serum cortisol, may be nearly maximally stimulated and unable to increase cortisol secretion further).

Note that cortisol results and thresholds need to be interpreted in light of the laboratory method used due to assay variability.

### **References**

Nieman LK. Evaluation of the response to ACTH in adrenal insufficiency, In UpToDate, Post TW(Ed). Waltham, MA: UpToDate Inc. <http://www.uptodate.com> (Accessed on 3<sup>rd</sup> January, 2018).  
[http://www.imperialendo.co.uk/Bible2017.htm#\\_Toc475264220](http://www.imperialendo.co.uk/Bible2017.htm#_Toc475264220) (accessed on 16/01/2018)