

## **Southern Derbyshire Shared Care Pathology Guidelines**

### **Short Synacthen Test for Primary Care**

The short Synacthen test is a simple procedure for investigating reduced adrenocortical function and adrenocortical reserve. It is a screening test and abnormal responses need to be followed up with further tests and an endocrinology opinion should be sought.

Synacthen (Tetracosactrin) is a synthetic analogue, comprising amino acids 1-24 of the 39 amino acid peptide Adenocorticotrophic Hormone (ACTH). This sequence retains the full biological activity of intact ACTH. Synacthen stimulates the normal adrenal cortex to secrete cortisol, which can then be measured in serum.

It should be noted that Prednisolone and hydrocortisone cross react with cortisol assays, but the short synacthen test is suitable for patients that have recently started steroid replacement or are on low dose steroids. For these patients, the steroid dose should be omitted the evening before the test (if possible) and on the morning of the test.

#### **CONTRAINDICATIONS**

Pregnancy, history of hypersensitivity to ACTH, Synacthen or Synacthen depot.

The synacthen test gives unreliable results in the six weeks following pituitary surgery.

Patients on the contraceptive pill or on hormone replacement therapy should stop this 6 weeks prior to the test.

For the assessment of adrenal status in patients receiving long term steroid treatment who are having difficulty coming off steroids, referral to the Endocrine team is suggested.

#### **SIDE EFFECTS**

Local or systemic hypersensitivity reactions have been reported very rarely following Synacthen injection, particularly in children with a history of allergic disorders.

#### **PRECAUTIONS**

Patient should be kept under observation throughout the period of this test.

## PREPARATION

### Planning

The test can be carried out at any time, but **should ideally be performed as near to 9am as possible**. Cortisol levels decline throughout the day and cortisol responses between the morning and late afternoon may differ by as much as 100 nmol/L at 30 minutes post Synacthen, making interpretation of afternoon tests difficult if the response in cortisol is abnormal. An adequate response to synacthen is a valid result at any time of day.

### Patient

No special preparation of the patient is required and fasting is unnecessary. All medication should be noted on the request form.

### Equipment

Obtain the Synacthen from a Pharmacy or Chemist (1 mL ampule, containing 250 micrograms). You will also require 2 SST (yellow top) vacutainer tubes.

## PROCEDURE

Samples must be clearly labelled with patient name, date and time, eg 09:30

Time (mins)	Test	Tube type
Basal sample	Cortisol	SST (yellow top)
0 min	Inject 250 micrograms of Synacthen i.m. or i.v. (Infant dose 36 micrograms per kg)	
30 min	Cortisol	SST (yellow top)

Send both cortisol samples together with a completed Chemical Pathology request form to the Chemical Pathology Department as soon as the test is finished.

## INTERPRETATION

A normal response is defined as a 30 minute serum cortisol concentration greater than 420 nmol/L. (NOTE: Roche generation II cortisol assay in use from 11/01/16 giving approximately 25% decreased results compared to the previous assay. The 420 nmol/L cut-off is therefore equivalent to the previously used cut-off of 540 nmol/L).

Analysis of increment in cortisol can add to interpretation in some circumstances but a high baseline cortisol due to concurrent stress may often preclude a further significant rise in cortisol without indicating adrenal insufficiency.

A normal result excludes primary adrenocortical insufficiency, but **does not necessarily exclude ACTH deficiency**. Partial ACTH deficiency may result in a normal or reduced response to Synacthen.

A decreased response may indicate:

1. Primary adrenal failure (such as Addison's disease). Results typically show a low baseline cortisol with little or no response to Synacthen
2. Adrenal atrophy secondary to prolonged ACTH deficiency
3. Adrenal atrophy secondary to long term steroid therapy (including topical, nasal or inhaled steroids)

Abnormal responses need to be followed up with further tests and an endocrinology opinion should be sought.

Females show a small but significantly greater incremental and stimulated cortisol value than males. There are no age-related changes in adults.

Values for baseline and post-Synacthen cortisol levels do not apply to women taking oral contraceptives.

The response to Synacthen is not affected by obesity.

Certain drugs, particularly steroids (Hydrocortisone and Prednisolone) may interfere with cortisol estimation. Please note all drug therapy, including topical, nasal or inhaled steroids on the request form so this possibility can be checked.

Authors: Biochemistry Standard Clinical Guideline Group, October 1995		
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