

Department:	Biochemistry		
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Document title:	Endocrine Dynamic Function Test Protocols - Adults		

High Dose Dexamethasone Suppression Test (HDDST)

Indications

Patients with definite Cushing's syndrome established by screening but aetiology (Cushing's disease, ectopic ACTH or adrenal adenoma/carcinoma) needs to be further differentiated.

The pre-test probability of ACTH-dependent Cushing's syndrome being secondary to pituitary-dependent Cushing's disease is 85-90%. The HDDST correctly identifies 69% of patients as having Cushing's disease. Since the diagnostic accuracy of this test in identifying Cushing's disease is less than the pre-test probability of making this diagnosis; this test is now rarely used in practice. If ACTH-dependent Cushing's syndrome has been diagnosed following a LDDST, IPSS is used to confirm pituitary localisation and exclude an ectopic source of ACTH.

Contraindications

- Patients on enzyme inducing drugs e.g. anti-convulsants may rapidly metabolise dexamethasone.
- Oestrogens (e.g. pregnancy, HRT or COC) may induce cortisol binding protein and artefactually increase total cortisol levels.
- Take care in patients with severe depression or hypomania.

Requirements

- A total of eight doses of dexamethasone should be written up (0900, 1500, 2100, 0300, 0900, 1500, 2100, 0300) and **must adhere strictly to the 6-hourly dosing frequency**. Adult dose 2mg
- 2 x brown top serum tubes for cortisol
- 2 x orange top lithium heparin tubes for ACTH

PATIENT PREPARATION

- Stop all oral oestrogen therapy 6 weeks prior to test. Implants can cause problems.

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Procedure

Time	Procedure	Samples
0845	Take basal samples for cortisol and ACTH	1 x brown top serum tube (cortisol) 1 x orange top Li Hep plasma (ACTH) – send immediately
0900	Patient takes 2mg dexamethasone	
1500	Patient takes 2mg dexamethasone	
2100	Patient takes 2mg dexamethasone	
0300	Patient takes 2mg dexamethasone	
0900	Patient takes 2mg dexamethasone	
1500	Patient takes 2mg dexamethasone	
2100	Patient takes 2mg dexamethasone	
0300	Patient takes 2mg dexamethasone	
0900	Take samples for cortisol and ACTH	1 x brown top serum tube (cortisol) 1 x orange top Li Hep plasma (ACTH) – send immediately

Interpretation of results

If the 0900h cortisol is less than 50% of the basal value after 48 hours of dexamethasone this is classified as showing suppression.

Suppression with high dose dexamethasone is usually seen in Cushing's disease but not in ectopic ACTH production or adrenal tumours.

The high dose dexamethasone test is useful but not totally reliable in the differential diagnosis of Cushing's syndrome as it is neither very sensitive nor specific. Suppression occurs in 75% of patients with Cushing's disease, 10-25% of patients with ectopic ACTH and 0-6% of patients with adrenal tumours. Patients with ectopic ACTH who show suppression tend to have occult and relatively benign tumours with lower levels of ACTH and cortisol. These patients are very hard to differentiate from Cushing's disease.

The 0900h cortisol after 48 hours is considered to be the best parameter to use to discriminate between Cushing's disease and ectopic ACTH. The criterion of 50% suppression at 48 hours should not be applied too rigidly as many cases of Cushing's disease will suppress by 40 or 45% or suppress after 72 hours. In difficult cases it is advisable to repeat the test as no patients with an adrenal tumour have been shown to have reproducible suppression and cases of Cushing's syndrome may show cyclical variation.

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