QUESTION 33 Endocrinology
One week after a 47-year-old male has transphenoidal pituitary surgery for a histologically confirmed non-functioning pituitary tumour, the following endocrine results are obtained:
thyroid-stimulating hormone (TSH) <0.05 mIU/L [0.30-5.00]
free thyroxine (FT$_4$) 16 pmol/L [10-23]
Synacthen Test:
0800 plasma cortisol 90 nmol/L [100-700]
0900 plasma cortisol 680 nmol/L [>550]
luteinising hormone (LH) <1 IU/L [2-8]
follicle-stimulating hormone (FSH) <1 IU/L [2-8]
testosterone 8 nmol/L [10-30]
growth hormone (GH) <0.03 ng/ml [ <10]

What is the next most appropriate management step at this point in time?
A. Observe and repeat testing in six months.
B. Commence thyroxine.
C. Commence hydrocortisone.
D. Commence testosterone.
E. Commence growth hormone.

This patient has overall reduced pituitary function. But the most important hormone that may be life threatening in cases of infection is cortisol.

Short Synacthen test

High dose ACTH
Indications: Used in pts acutely unwell or pt who present with signs and symptoms suggestive of primary adrenal insufficiency

Procedure: an IV line is placed 30 mins before the test for rapid phlebotomy and to eliminate temporary rise in cortisol ass with a needle stick. IV line kept open with NaCl (50ml/hr). Blood is drawn for ACTH and cortisol. Synacthen 250mcg is injected over 2 mins as IV bolus. Blood is taken at 30 and 60 mins post injection.

If pt is receiving hydrocortisone, medication should be withheld for at least 12 hrs before testing. If pt is receiving dexamethasone, there is some cross-reactivity in some assays and cortisol levels may not be accurate.

Interpretation:
A criteria for minimal normal cortisol response of 500-550nmol/L are required
A serum cortisol value of 550nmol/L or more at any time during the test (even bf test) is indicative of normal adrenal function. (even if 1st criteria not fulfilled)
Secondary adrenal insufficiency
Normal adrenal gland will respond to maximally stimulating concentrations of exogenous ACTH.

Primary adrenal insufficiency
The endogenous ACTH secretion will be already elevated and there should be little or no adrenal response to exogenous ACTH

Low dose ACTH
Indications: Pts with subtle signs of adrenal insufficiency or patients who have been treated with glucocorticoids and determination of adrenal reserve is necessary. Pts ho have autoimmune disease and may have early adrenocortical insufficiency may be best assessed with this test.

Procedure: same as above but 1mcg of Synacthen is used

Pituitary surgery

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1 www.endotext.org
Respond normally to high-dose ACTH test
Fail to respond to insulin-induced hypoglycemia (cannot increase ACTH secretion).

**Preop**
1) important to determine if patient has hypothyroidism which increases the risk of respiratory arrest following postoperative administration of opiates of barbiturates. Hypothyroidism should be corrected preoperatively
2) Identify a marker such as FSH or free alpha subunit to monitor response to surgery

**Immediate post op**
1) diabetes insipidus, SIADH or both
   - associated with manipulation of pituitary and its stalk during surgery
   - major cause is inappropriate ADH release from injured posterior pituitary gland
   - UO and serum sodium conc should be measure often
   - Cortisol deficiency may contribute to hyponatremia
   - Pts with polyuria due to DI should be treated with aqueous vasopressin
   - Desmopressin (longer acting) should be avoided at this time because it might cause hyponatremia if DI suddenly remits. Used if DI lasts for more than 4-5 days
   - Maintenance hydrocortisone should be prescribed at discharge.

**Short term post op (4-5 wks)**
1) evaluation for amount of residual adenoma, visual function and hormonal function
   - MRI (edema from surgery could obscure image)
   - Monitoring serum conc of ganadotroph adenoma product ex FSH or alph subunit

2) Hormonal function
   - serum thyroxine
   - early AM cortisol 48 hrs after discontinuation of hydrocortisone. (< 83nmol/L → hypoadrenal, > 497nmol/L → normal adrenal function)
* Up to date says that Synacthen test should not be used as it may give a falsely normal result an recommended metyrapone test
   - serum testosterone (males)
   - serume estradiol (females)
   - 24hr urine volume if pt has significant nocturia
     water deprivation test performed if UO is > 3L/day, if >6L/day (definitely DI

**Long term post op** (Every 6 – 2 months)
1) Detect growth of residual adenoma tissue
   - vision testing
   - MRI
   - Monitor serum marker
     If no regrowth after a year or 2, the interval between scans can be lengthened
     If residual tissue grows progressively, it should be treated by radiation therapy
2) Adequacy of hormonal replacement

**Answer: hydrocortisone C.**
I found this question extremely hard as there was no definite firm answer in all my readings. But Up to date says that hydrocortisone should be prescribed at discharge and has no mention of all the other hormones until 4-5 weeks post op when hormonal function is tested.

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2 Up to date : Treatment of gonadotroph and other clinically non-functioning adenomas