

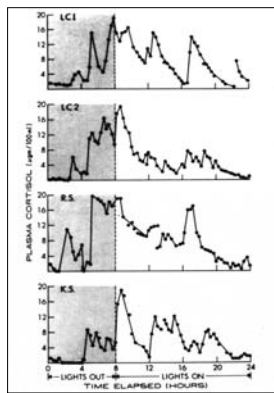
Physiology of the Adrenals

Thomas P. Jacobs MD

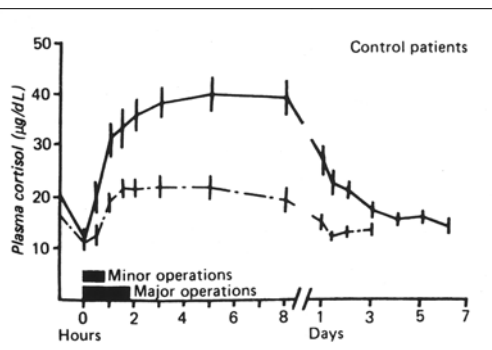
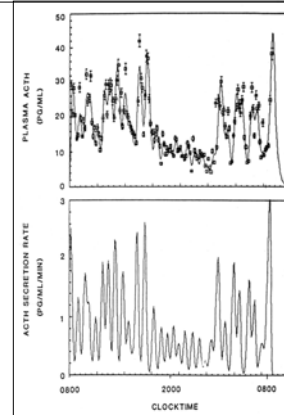
Regulation of ACTH

- 1. DIURNAL PERIODICITY
- 2. NEGATIVE FEEDBACK
- 3. STRESS

Diurnal Cortisol In Four Subjects

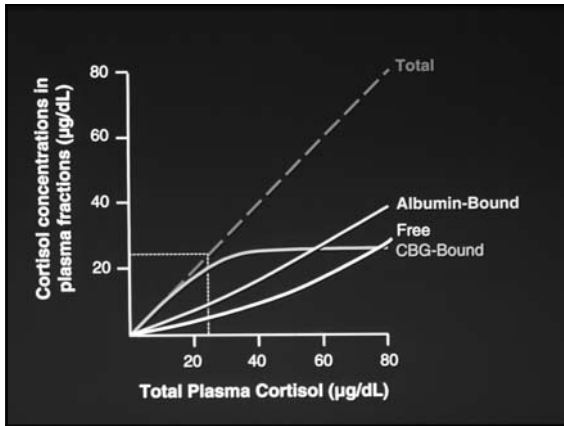


ACTH Pulsatility Over 24 Hours

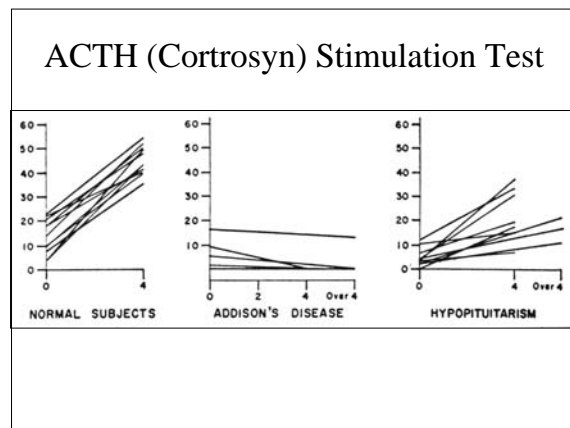
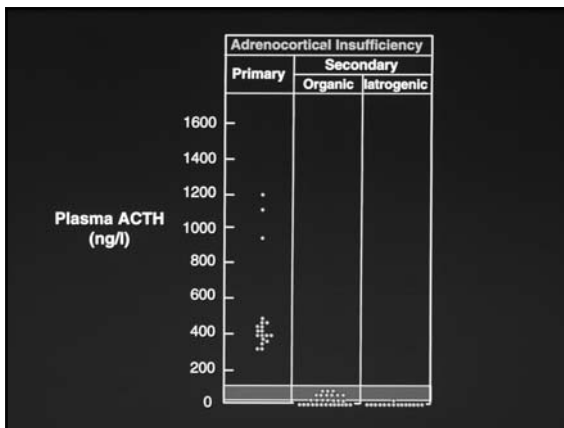


ASSESSING THE HPA AXIS

- CRH
- ACTH
- Androgens: DHEA, DHEA-S, androstenedione
- Cortisol: Serum levels fluctuate
 - Transcortin, albumin binding
 - 24 hour urine free cortisol
 - Salivary cortisol



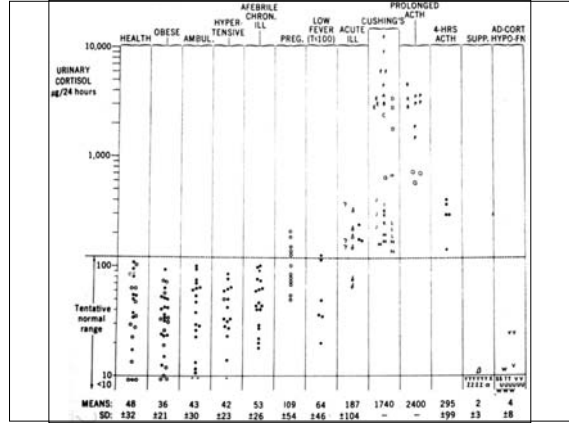
HYPOADRENALISM



Diagnosis of Central Hypoadrenalism

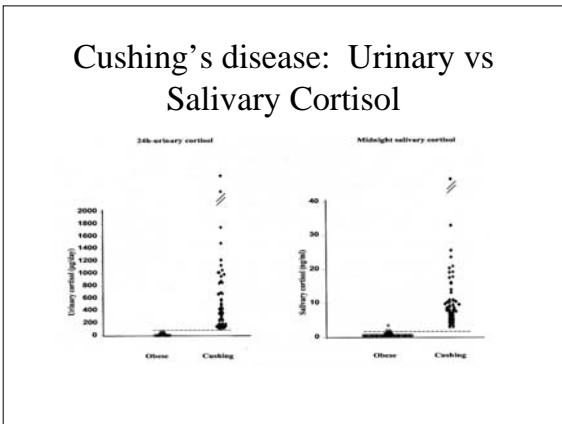
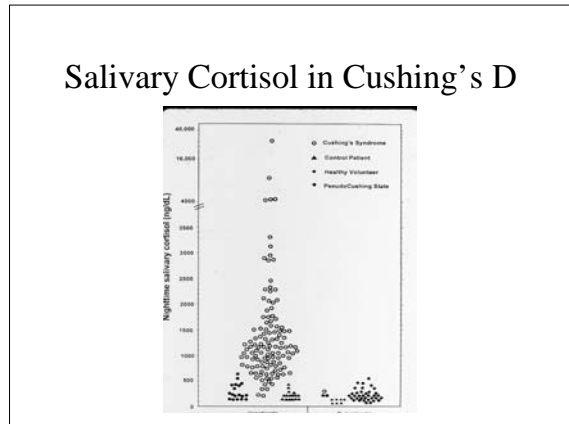
- 8-9 AM cortisol, ACTH
- Cortrosyn (ACTH) stimulation test
- Response to physiologic dose of glucocorticoids
- Insulin tolerance (hypoglycemia) test

CUSHING'S SYNDROME



2mg Dexamethasone Suppression Test

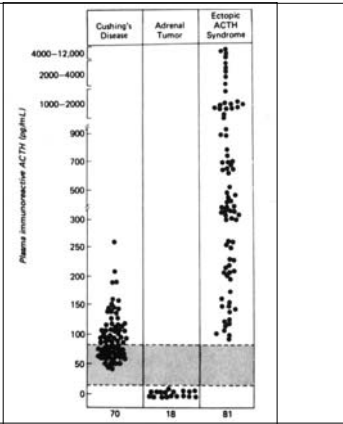
1. Collect 24 hour urine cortisol
2. Start dexamethasone 0.5mg q6h for two days
3. On day 2, collect 24 hour cortisol
4. Normal response <20mcg/24hr



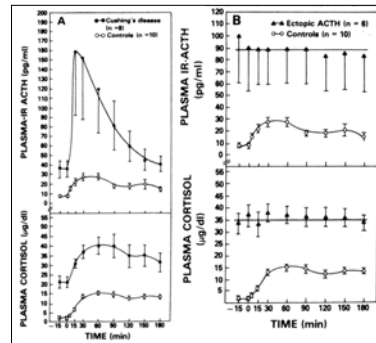
Differential Diagnosis of Cushing's Syndrome

STEP 1: Measure ACTH

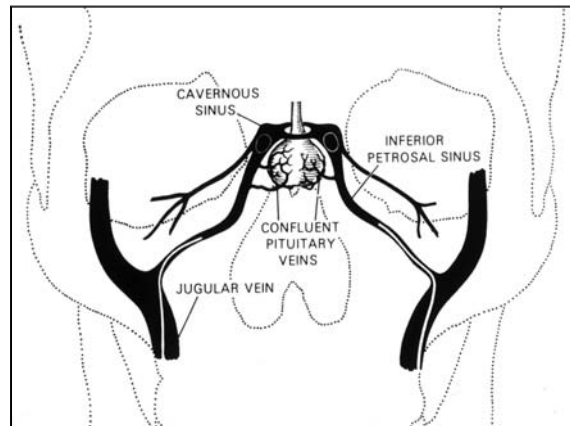
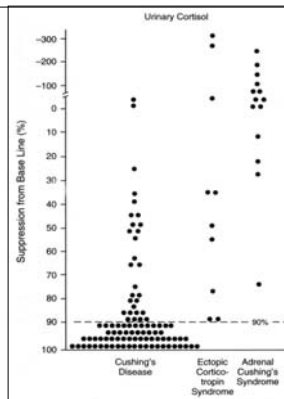
ACTH in Cushing's



CRH Test in Cushing's Syn.



8mg Dex Suppression Test



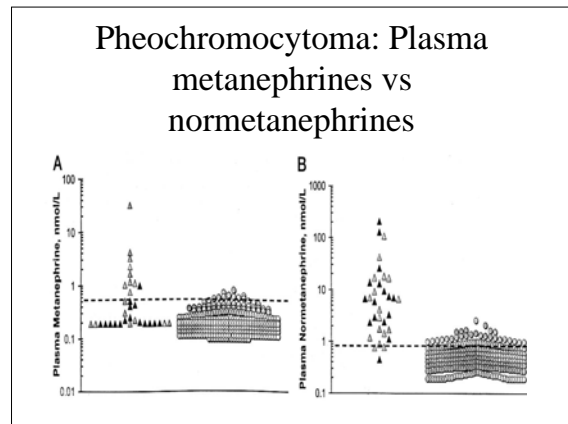
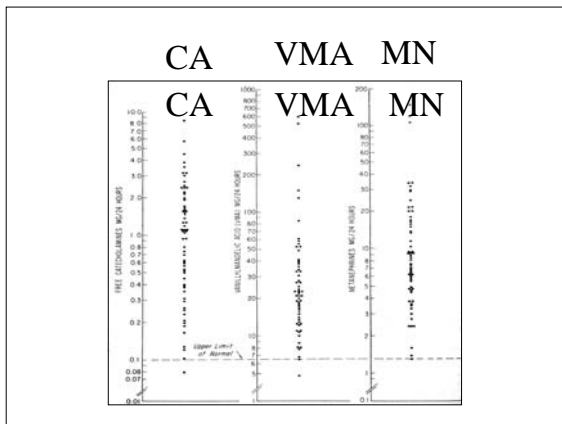
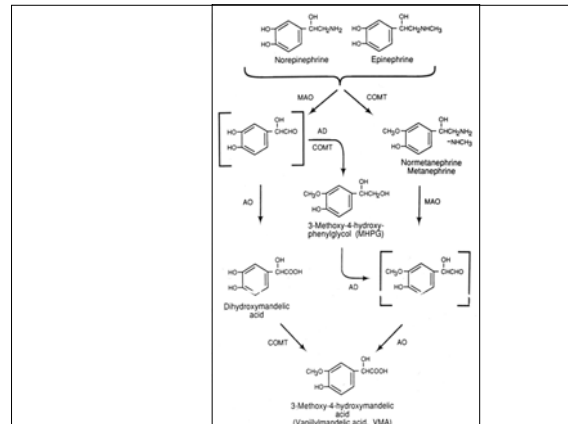
Unusual Causes of Cushing's S.

- Ectopic CRH secretion by tumor
- Alcoholic pseudo-Cushing's
- Adrenal adenomas with ectopic receptors to LH, vasopressin, GIP, etc
- Bilateral adrenal nodular hyperplasia
- Munchausen's syndrome
- Excessive topical exposure (skin, lungs, etc)

DISORDERS OF CHROMAFFIN TISSUE

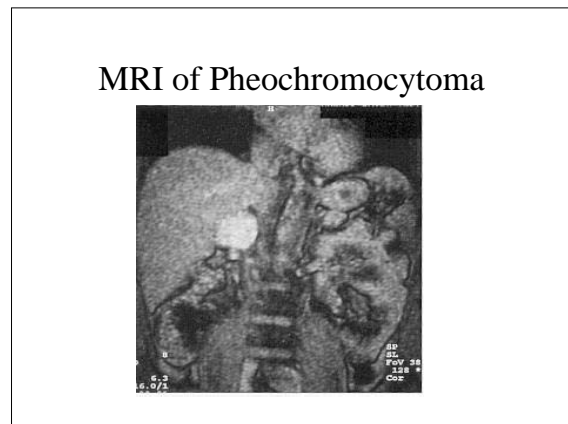
Sympathetic Spells

- Anxiety-panic disorder
- Tachyarrhythmias
- Hyperbeta adrenergic syndrome
- Crack cocaine
- Beta-blocker, clonidine withdrawal
- Temporal Lobe (autonomic) seizure
- MAOI's, amines, sympathomimetics

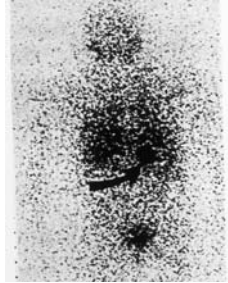


Localization of Pheochromocytomas

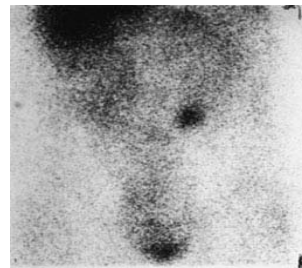
- CT scan
- MRI scanning
- Octreotide Scanning
- MIBG Scanning



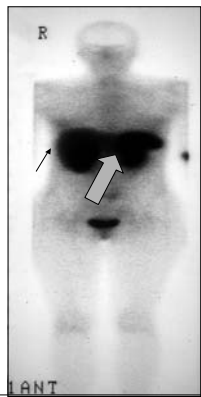
MIBG Scan in
Pheochromocytoma



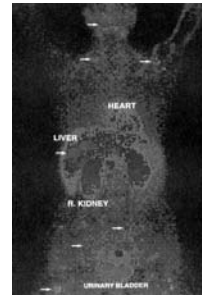
Octreotide Scan in
Pheochromocytoma



Patient AK
Octreotide
Scan



FDG-PET Scan of Metastatic
Pheochromocytoma



That's all about the adrenals!

