

NB in general typically when there is damage to the adrenals ALL hormones are affected because the common causes affect the entire gland = it's hard to damage one part of the gland without harming the other

Low Aldo

- 1°: refer to table
- 2°: low Renin (CKD dz, RAAS inhibitors, etc) and HypoK

Low Cortisol (refer below)

- 1°: refer to table
- 2°: refer to table

Low DHEAS

- 1°: refer to table
- 2°: refer to table

Low Epi

- 1°: refer to table
- 2°: not quite sure

1° Adrenal Insufficiency (Addison's Dz)		2° Adrenal Insufficiency																																	
Other S/S		Other S/S																																	
<ul style="list-style-type: none">Hyperpigmentation 2/2 general loss of negative feedback inhibition on H/P resulting in increase of melanocyte stimulating hormone (esp palmar creases, mucosa, knuckles, pressure areas, nipples, et al)		<ul style="list-style-type: none">Hypopituitarism/hypothalamism																																	
Imaging		Imaging																																	
<ul style="list-style-type: none">+CT-Abdomen (adrenal hemorrhage, calcification in TB, enlarged/masses in mets, small in autoimmune, etc)		<ul style="list-style-type: none">+MRI-Head																																	
<ul style="list-style-type: none">Cosyntropin (~ACTH) Stimulation Test (CST): measure baseline serum cortisol (mcg/dL) level at 0600, give high dose (250mcg) or low dose (1mcg, some say more sensitive) cosyntropin, measure cortisol @ 30min and @ 60min																																			
<table><tr><th colspan="4">Cosyntropin Stimulation Test</th></tr><tr><th></th><th>Pre-Cortisol Level (mcg/dL) @ 6am</th><th>Post-Cortisol Level (mcg/dL) @ 30/60min whichever is greater</th><th>Probability of Adrenal Insufficiency</th></tr><tr><td rowspan="4">NON-ICU</td><td><3</td><td>NA</td><td>Very High</td></tr><tr><td rowspan="2">3-18</td><td>Increase by <20</td><td>High</td></tr><tr><td>Increase by >20</td><td>Low</td></tr><tr><td>>18</td><td>NA</td><td>Very Low</td></tr><tr><td rowspan="4">ICU</td><td><15</td><td>NA</td><td>Very High</td></tr><tr><td rowspan="2">15-34</td><td>Increase by <9</td><td>High</td></tr><tr><td>Increase by >9</td><td>Low</td></tr><tr><td>>34</td><td>NA</td><td>Very Low</td></tr></table>				Cosyntropin Stimulation Test					Pre-Cortisol Level (mcg/dL) @ 6am	Post-Cortisol Level (mcg/dL) @ 30/60min whichever is greater	Probability of Adrenal Insufficiency	NON-ICU	<3	NA	Very High	3-18	Increase by <20	High	Increase by >20	Low	>18	NA	Very Low	ICU	<15	NA	Very High	15-34	Increase by <9	High	Increase by >9	Low	>34	NA	Very Low
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Screening Tests		Screening Tests																																	
<ul style="list-style-type: none">CST: glands are sick so they will NOT respond to ACTH acutely hence +CST and they won't overtime		<ul style="list-style-type: none">CST: glands are atrophied so they will NOT respond to ACTH acutely hence +CST but will over time																																	
Confirmatory Tests		Confirmatory Tests																																	
<ul style="list-style-type: none">Increased ACTH/ReninDecreased Cortisol/Aldo/Androgens		<ul style="list-style-type: none">Decreased ACTH but normal ReninDecreased Cortisol but normal Aldo and Androgens																																	
Treatment																																			
<ul style="list-style-type: none">NON-ICU or Chronic Pt (Chronic Adrenal Insufficiency)<ul style="list-style-type: none">First: Confirm w/ TestsThen if +: Hydrocortisone 20-30mg PO divided 2/3 at 0800 and 1/3 at 1200 and Fludrocortisone 0.05-0.1mg PO Qam (if you suspect Aldo insufficiency b/c 1° adrenal insufficiency) and Sex Steroids ? (if you also suspect DHEA-S insufficiency b/c 1° adrenal insufficiency) NB hydrocortisone will interfere with cortisol assay therefore some use low dose PO dexamethasone 4-6mg PO divided 2/3 at 0800 and 1/3 at 1200ICU or Acute Pt (Addisonian Crisis)<ul style="list-style-type: none">First: Treat immediately w/ empiric Dexamethasone 2-4mg IV Q4-6hrs and Fludrocortisone 0.50-1.0mg IV Qam and aggressive hydrationThen: Confirm w/ TestsThen if +: Hydrocortisone 50-100mg IV Q6-8hrs and Fludrocortisone 0.25-0.5mg PO Qam (" ") and Sex Steroids ? (" ")NB Med Alert Bracelet and advice pt to increase steroids when under a stressed state and to keep Dexamethasone 4mg IM prefilled syringes for emergency situations																																			
<ul style="list-style-type: none">Autoimmune (1° USA)<ul style="list-style-type: none">IsolatedPolyGlandular Autoimmune syndromes (PGAs)		<ul style="list-style-type: none">Abrupt Cessation of Exogenous Cortisol or Equivalent (prior the presence of exogenous steroids feedback and inhibited ACTH and																																	

	when they are abruptly ceased the pituitary does not have enough time to increase ACTH, highly variable for each person but typically treatment for >2wks w/ dosages >7.5mg/day will suppress the adrenal gland and can last up to 1yr, NB inhaled corticosteroids do not interfere)
<ul style="list-style-type: none"> • Infection (2° Rest of the World) <ul style="list-style-type: none"> ○ Bacterial: TB ○ Fungal: Histo ○ Viral: CMV, HIV 	<ul style="list-style-type: none"> • Pituitary Dz
<ul style="list-style-type: none"> • Iatrogenic <ul style="list-style-type: none"> ○ Bilateral Adrenalectomy ○ Adrenal Enzyme Inhibitors esp Etomidate (used during intubation even after a single dose) 	<ul style="list-style-type: none"> • Hypothalamic Dz
<ul style="list-style-type: none"> • Infiltrative <ul style="list-style-type: none"> ○ Hemochromatosis ○ Amyloidosis ○ Sarcoidosis 	
<ul style="list-style-type: none"> • Vascular <ul style="list-style-type: none"> ○ Hemorrhage <ul style="list-style-type: none"> ▪ Waterhouse Friederickson Syndrome (Neisseria meningitidis infection → meningitis → Meningococcemia (DIC w/ Purpura) → bilateral adrenal hemorrhage) ▪ Post-Partum ▪ Anticoagulation Tx ▪ Trauma ○ Thrombosis 	
<ul style="list-style-type: none"> • Metastatic Cancer (must destroy >90% of gland, metastasis to adrenals is common b/c of the vast blood supply to the gland in comparison to its physical size) <ul style="list-style-type: none"> ○ Lung Mets 	
<ul style="list-style-type: none"> • Enzyme Deficiency <ul style="list-style-type: none"> ○ Adrenoleukodystrophy: X-linked enzyme deficiency in long fatty acid chain metabolism resulting in adrenal insufficiency AND neurologic deterioration 	