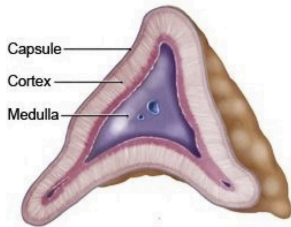
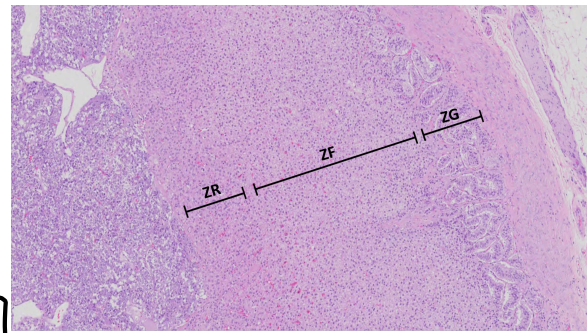


Adrenal Gland Histology, Physiology and Disease

Transverse Section



Microscopic Section



Factors acting on the gland

Hormones Secreted

Zona Glomerulosa

Angiotensin and ACTH stimulates the secretion of

mineralocorticoids (aldosterone)

Zona fasciculata

ACTH stimulates the secretion of

Glucocorticoids (cortisol and corticosterone)

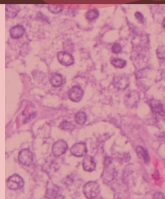
Androgens (Dihydroepiandrosterone; androstenedione)

Zona Reticularis

ACTH stimulates the secretion of

Glucocorticoids

Androgens



Adrenal Medulla

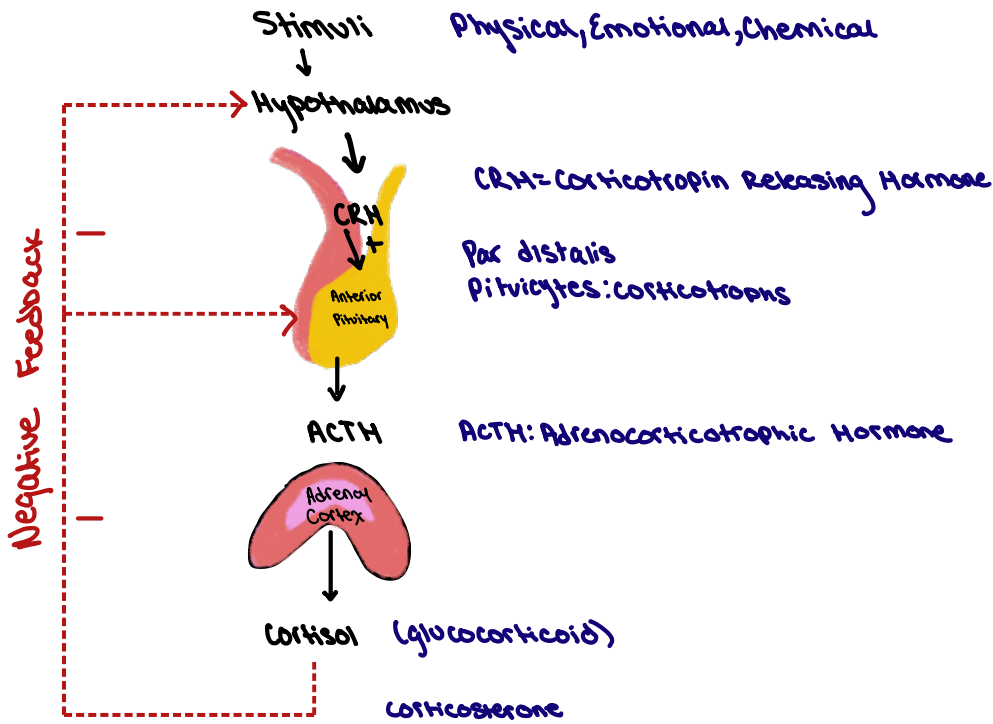
Preganglionic Fibers stimulate the liberation of

Epinephrine

Memory Tip: Layers of the Cortex "GFR, Salt, Sugar, Sex"

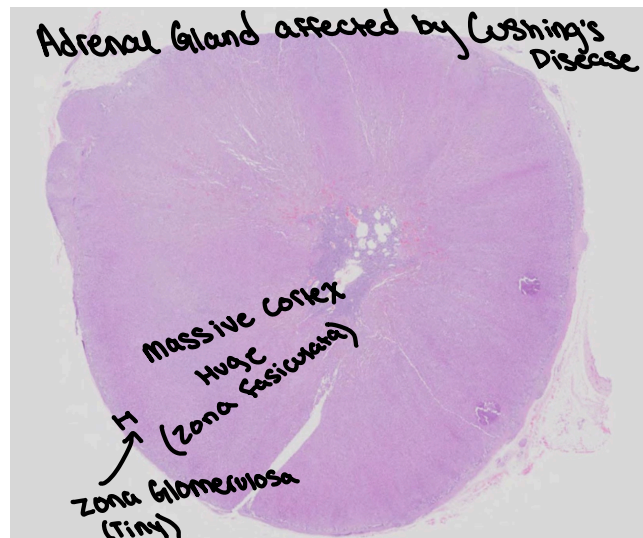
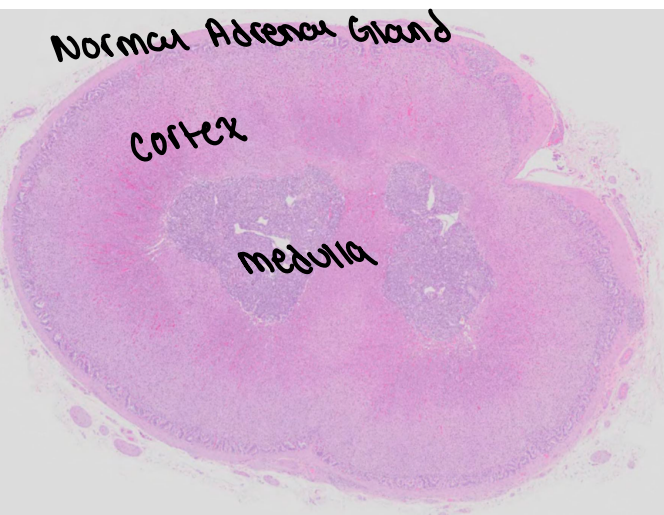
mineralocorticoids Glucocorticoids Androgens

Hypothalamic-Pituitary-Adrenal (HPA) axis

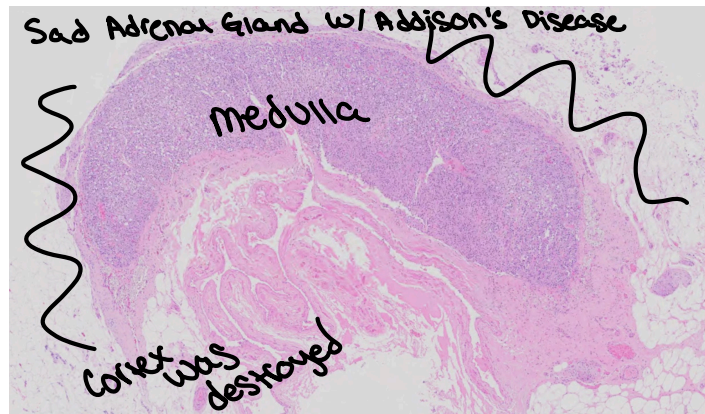


Diseases of the Adrenal Gland

Cushing's Disease: Hyperadrenocorticism. In this case, it is due to an ACTH-secreting tumor in the pituitary gland causing hypertrophy of the adrenal cortex, particularly the zona fasciculata.



Idiopathic (Primary) Addison's Disease: Hypoadrenocorticism. In this case, the entire cortex is destroyed and atrophied by unknown mechanisms (idiopathic). This wipes out the production of all cortex derived hormones.

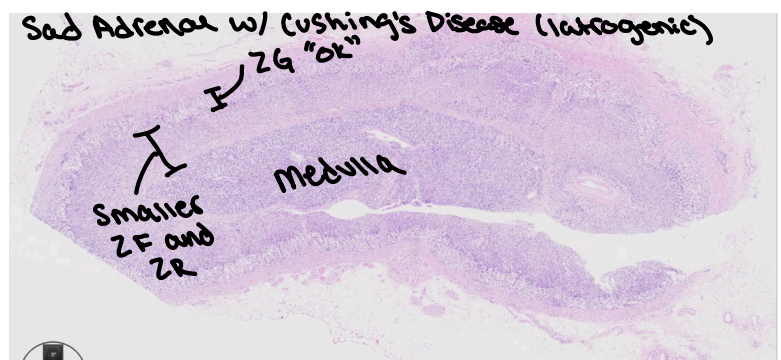
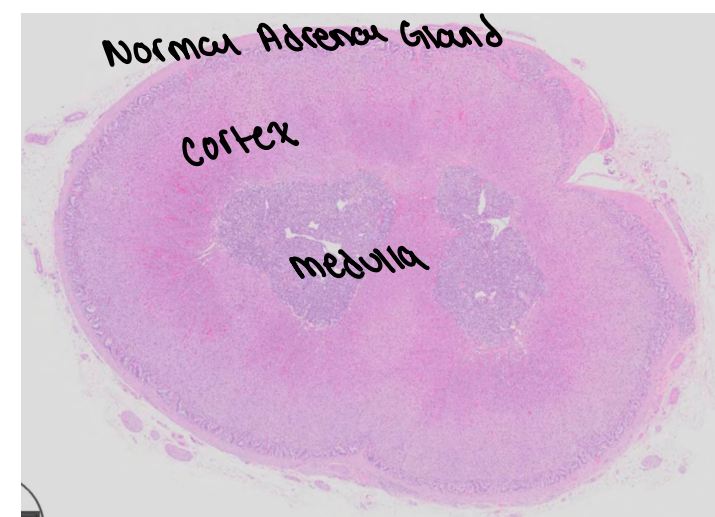


This adrenal gland shows signs of 4th atrophy

Patient would need to be given 2 medications

1. Desoxycorticosterone pivalate (DOP) "Zycortal" to replace mineralocorticoids ^{↙ Zona Glomerulosa}
2. Prednisone: replace the cortisol deficiency ^{↙ Zona Fasciculata}

Iatrogenic Cushing's Disease: In this case, administration of a potent glucocorticoid (prednisone or dexamethasone) results in atrophy of the zona fasciculata and reticularis, but relative sparing of the zona glomerulosa. The drug "does the job" of the zona fasciculata (sugar) ^{↙ glucocorticoids} and to a lesser extent the zona reticularis, resulting in downregulation and physical atrophy of these layers.



You can determine if Cushing's is iatrogenic by looking

at the patient history. Both forms will look the same clinically. This is why you have to **taper off** Steroids! There is a lot of neg. feedback to the pituitary gland so there is low secretion of ACTH. If pred. was immediately stopped there would be little to no ACTH being made.

