Medications Associated with the Care of Patients with Pituitary Tumors

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Relevant Financial Disclosure(s)

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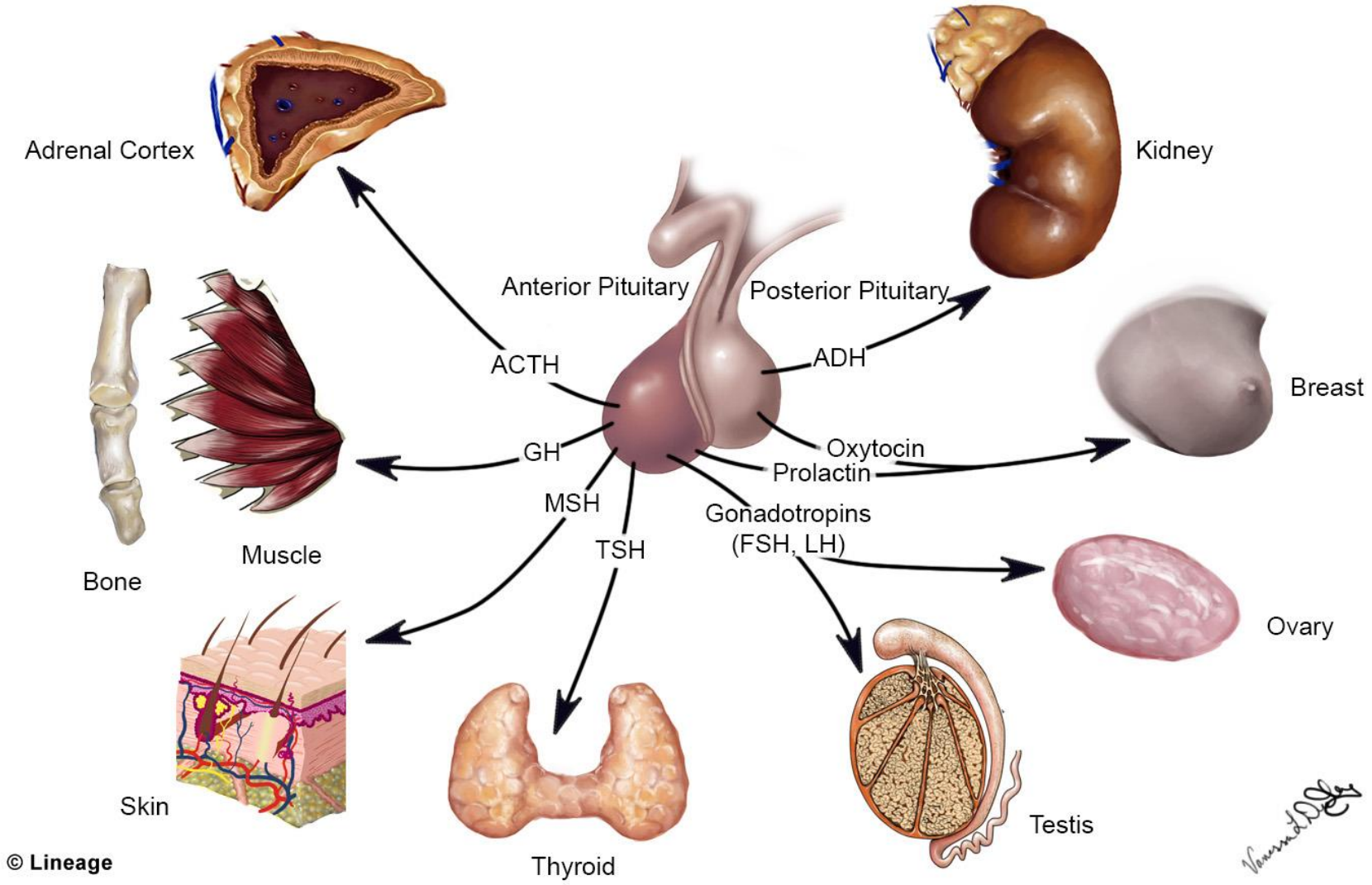
I have nothing to disclose.

Objectives

- Understand the basic pathophysiology of pituitary tumors.
- Understand the medications used in the medical management of pituitary tumors.
- Understand the medications used for replacement of pituitary hormones.

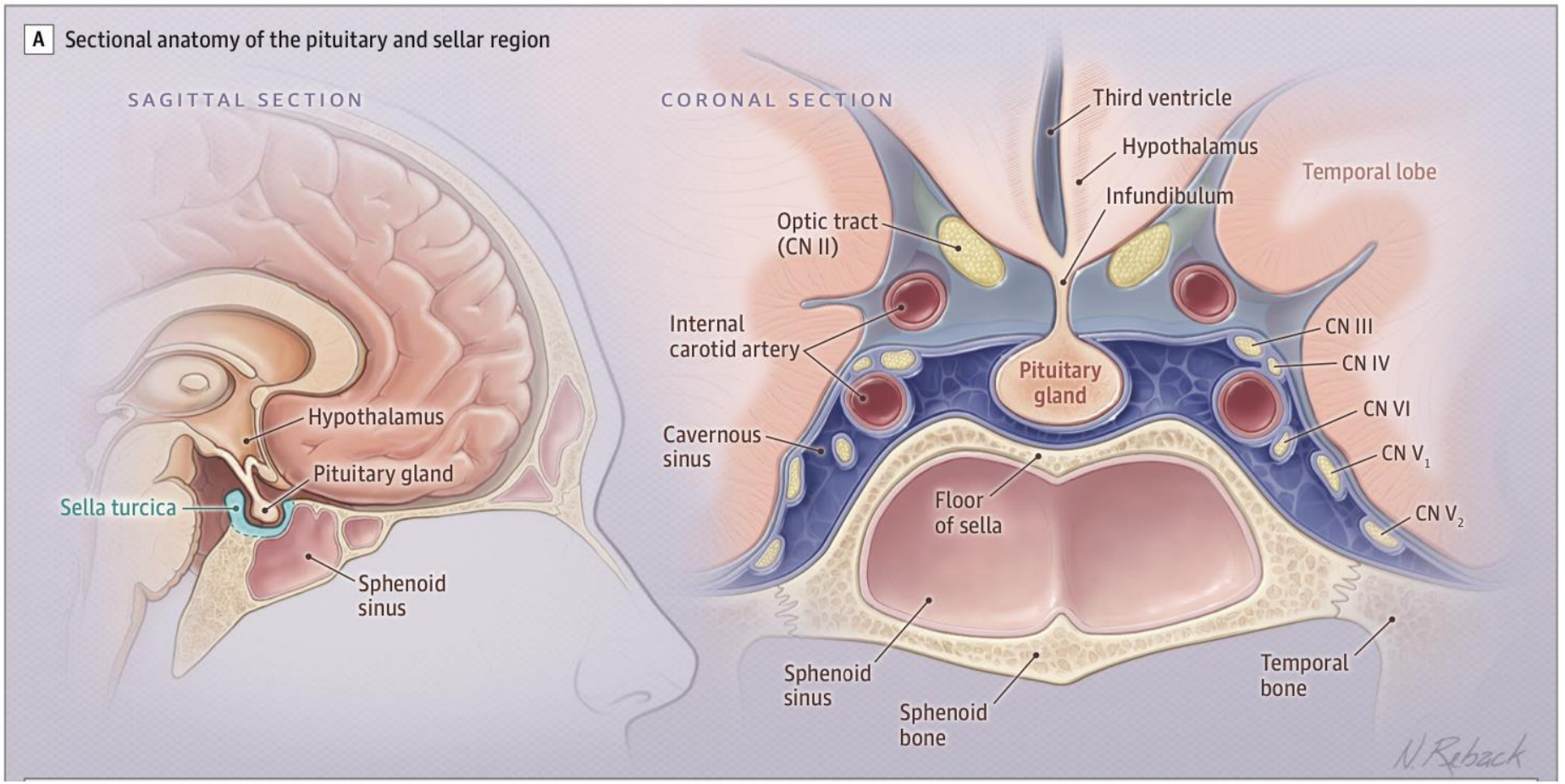
Pituitary anatomy



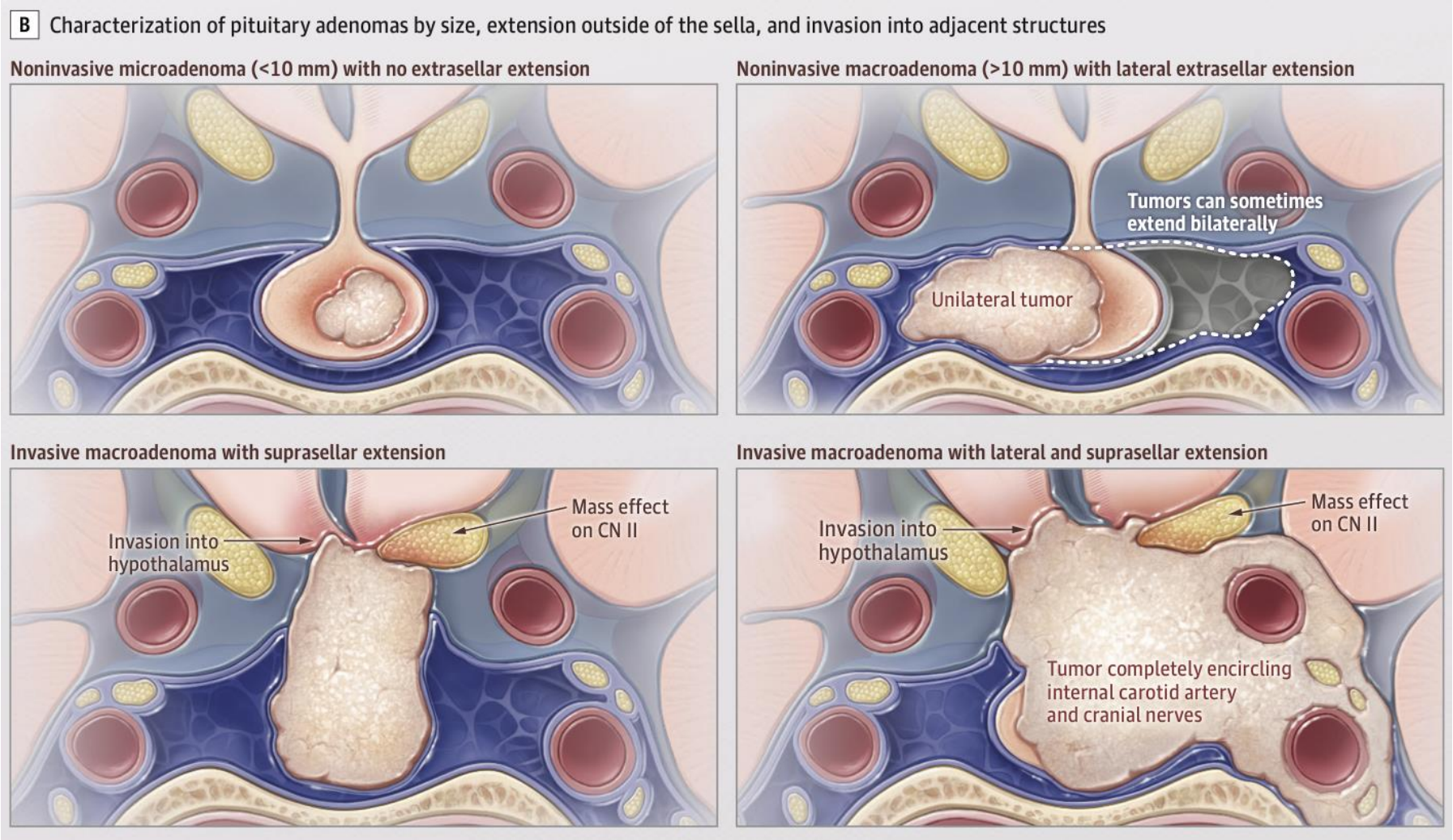
https://step1.medbullets.com/endocrine/109002/pituitary-hypophysis

Anatomy

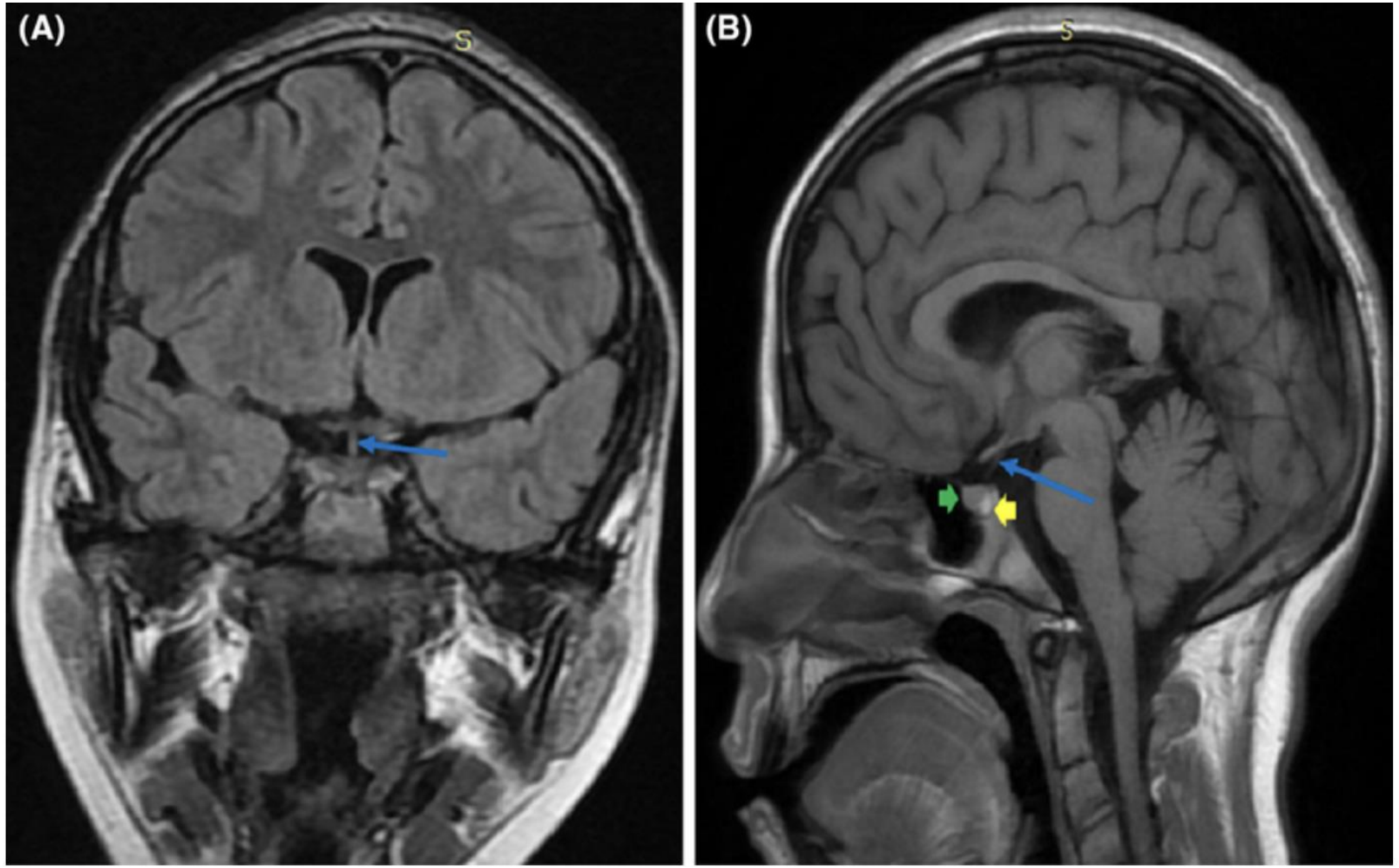
Figure 1. Categorization of Pituitary Adenomas



Anatomy


B Characterization of pituitary adenomas by size, extension outside of the sella, and invasion into adjacent structures
Noninvasive microadenoma (<10 mm) with no extrasellar extension
Noninvasive macroadenoma (>10 mm) with lateral extrasellar extension
Tumors can sometimes extend bilaterally
Unilateral tumor
Invasive macroadenoma with suprasellar extension
Invasion into hypothalamus
Mass effect on CN II
Invasive macroadenoma with lateral and suprasellar extension
Invasion into hypothalamus
Mass effect on CN II
Tumor completely encircling internal carotid artery and cranial nerves

Pituitary gland on MRI

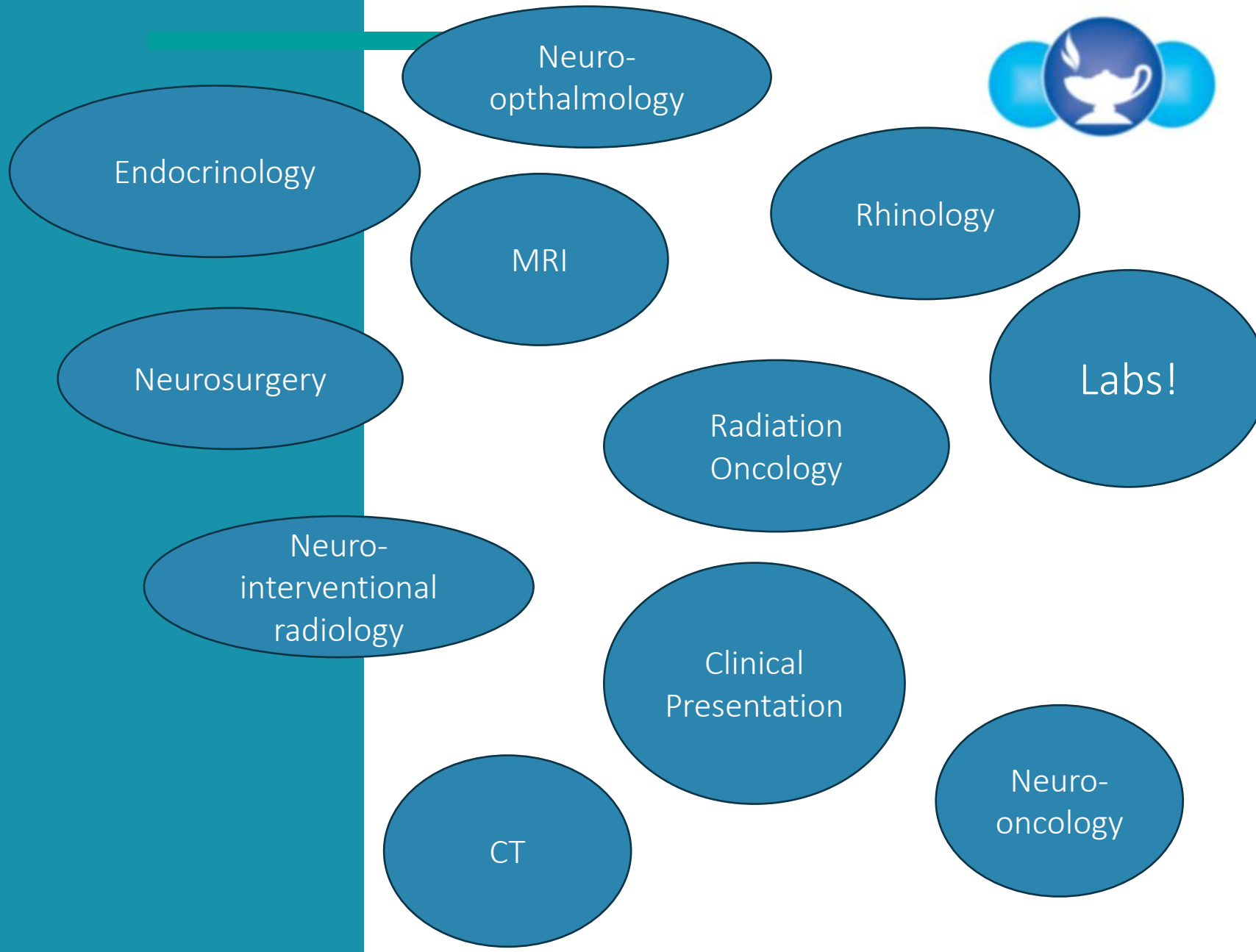


Normal pituitary MRI in coronal (A) and sagittal (B) sections showing the pituitary stalk (blue arrow), the anterior pituitary (green arrowhead), and the posterior pituitary (yellow arrowhead) in anatomical position.

https://www.researchgate.net/figure/Normal-pituitary-MRI-in-coronal-A-and-sagittal-B-sections-showing-the-pituitary-stalk_fig3_373718996

Work up.

Who and What do you need?



Endocrinology, we need your…..

Tumor Types and How We Treat

- Prolactinoma
- Corticotropinomas
- Somatotropinomas
- Thyrotropinomas
- Non-functioning tumors
- Malignancies

https://www.gq-magazine.co.uk/article/one-direction-gq-covers-interview

Prolactinoma

Dopamine agonists: Cabergoline and Bromocriptine

Cabergoline

-Ergot derivative

-Hyperprolactinemia agent

-Dopamine agonist (D2)

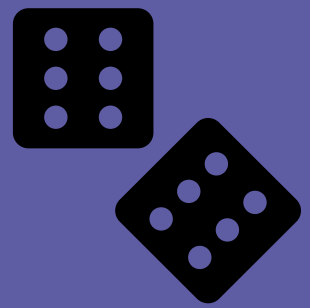
Oral:

Start at 0.25 to 0.5mg/week

Divided into 1 or 2 doses

May increase by 0.25 to 0.5mg every 4 weeks

Titrate to serum prolactin levels



-GI : Nausea

-Nervous System: Dizziness, headache

-Obvious or known sensitivity

-Uncontrolled hypertension

-Valvular heart disease

Bromocriptine

-Ergot derivative

-Hyperprolactinemia agent

-Dopamine agonist (D2)

-Anti-Parkinson agent

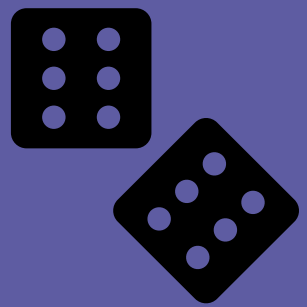
-Antidiabetic agent

Oral:

Start at 1.25 to 2.5 mg daily

May increase by 2.5 mg per day every 2 to 7 days

Titrate to serum prolactin levels



-GI : Nausea, Constipation

-Nervous System: Dizziness, headache,

-Neuromuscular: generalized weakness

-Rhinitis

-Obvious or known sensitivity

Corticotropinomas

It’s complicated.

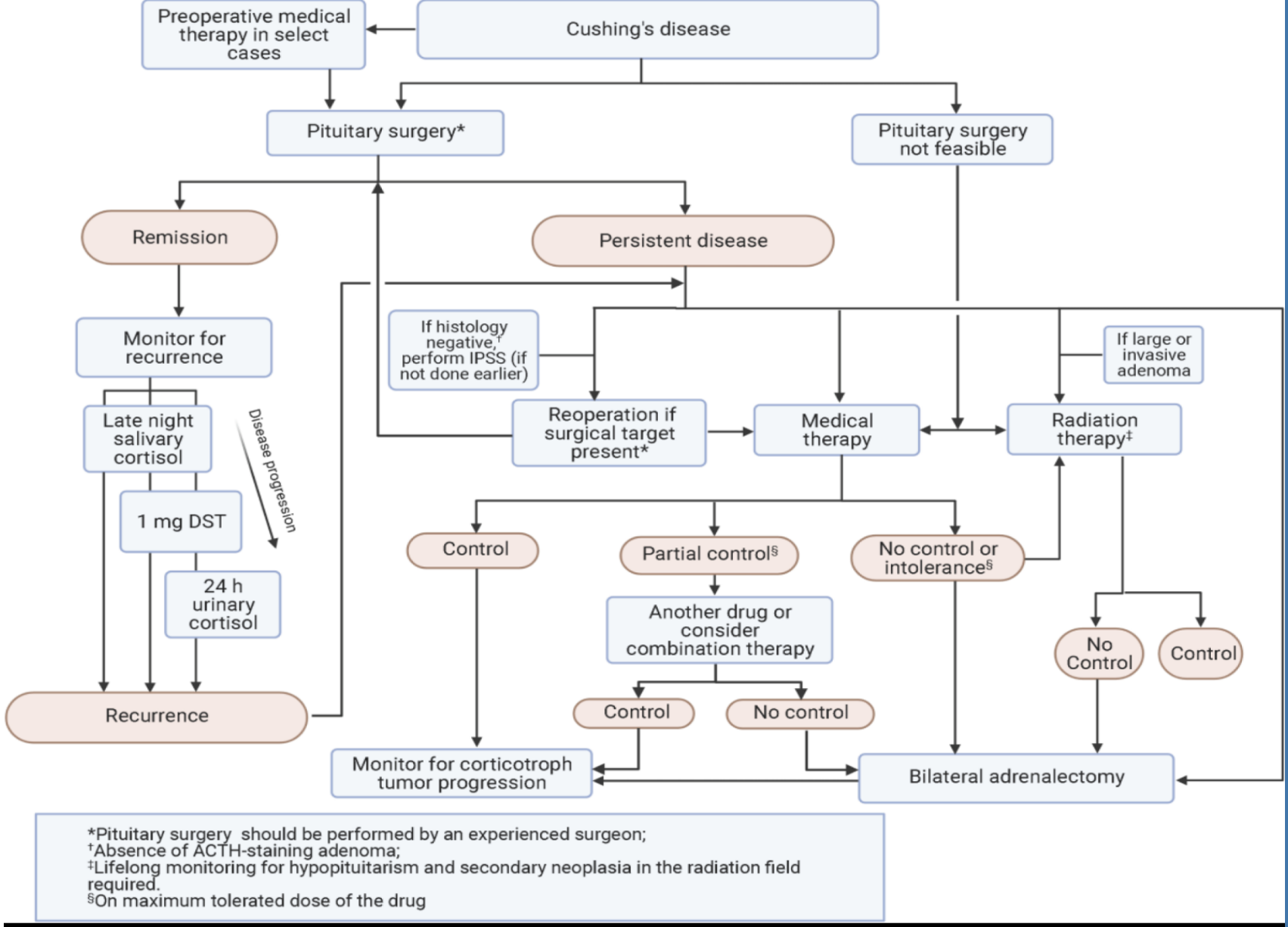


Figure 2.. Algorithm for management of Cushing's disease. Abbreviations: ACTH, adrenocorticotropin; DST, dexamethasone suppression test; IPSS, inferior petrosal sinus sampling.

Ketoconazole

-Steroidogenisis inhibitor

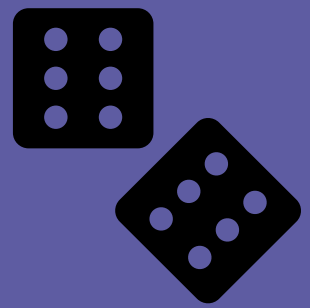
-Fungal Infections

-Advanced prostate cancer (off label)

Start with 400 to 600mg/day divided into 2-3 doses.

Increase dose by 200mg per day every 1-4 weeks

Target dosing most studies 300-400mg BID



-GI

-Fatigue

-Headache

-Drugs that cause QT prolongation

-Acute or chronic liver disease

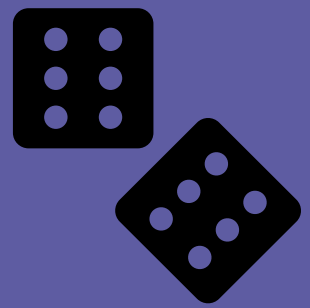
Pasireotide

-somatostatin receptor ligand

-Administered daily, SC or once monthly IM

-IM dosing is 10-30mg

-SC dosing 0.3-0.9 mg/ml BID



-glucose impacts

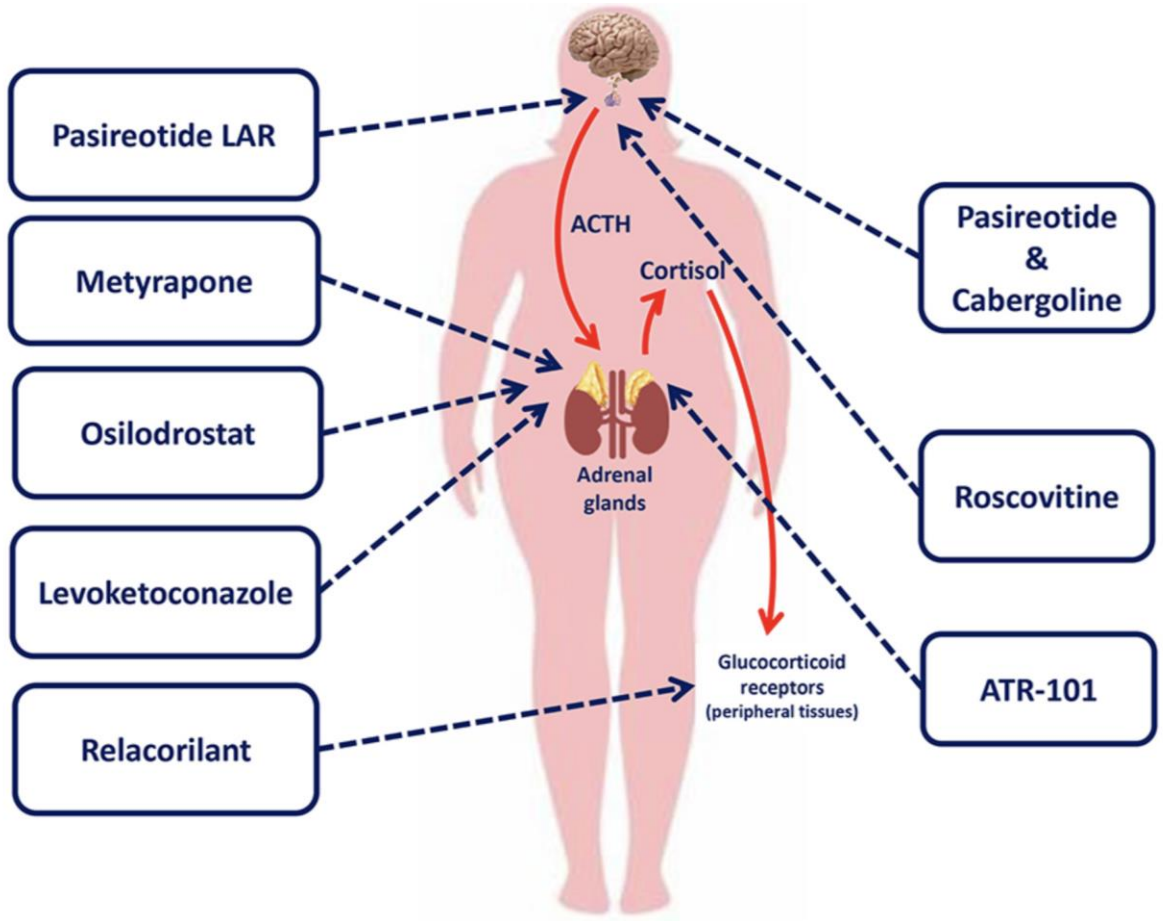
-cholelithiasis

-risk for QTc prolongation

-hypersensitivity

Other Medications Used in Hypercortisolism

- Metyrapone
- Mitotane
- Etomidate – YES! You read that correctly.
- Levoketoconazole
- Osilodrostat
- Cabergoline
- Mifepristone



Somatotropinomas

Somatostatin analogs: octreotide, lanreotide, pasireotide; GH receptor antagonist: pegvisomant; Dopamine agonists: cabergoline

Octreotide

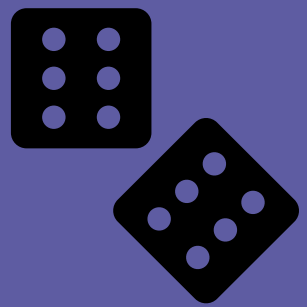
-Somatostatin analog

-Comes in IM, SC or Oral formulations

-IM: Start with 20mg q4 weeks, after that base dose on clinical response

-SC:50mcg TID, titrate to achieve target GH and IGF-1 levels

-Oral: 20mg BID, adjust dose every 2 to 4 weeks



-Numerous side effects. Frequency of cardiac, endo, and GI reactions are typically higher in patients with acromegaly

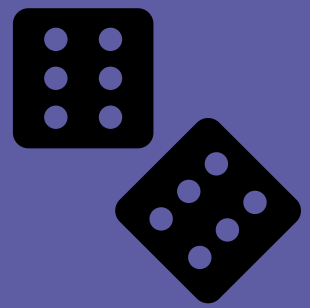
-Hypersensitivity

Lanreotide

-Somatostatin analog

-Administered SC

-Initial Dose is 90mg every 4 weeks for 3 months, dose adjusted to clinical response



-Similar side effect profile to octreotide

-Hypersensitivity

Pegvisomant

-GH receptor antagonist

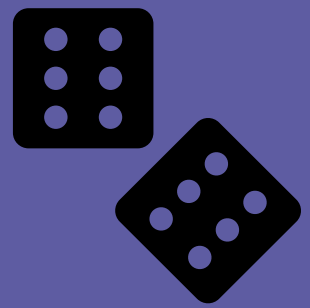
-Generally a second line therapy

-Subq route

-Initial daily dose of 10mg subq (Also may have loading dose)

-Dose adjusted every 4 to 6 weeks

-Titrated to keep IGF-1 (not GH) in normal range



-Watch for liver toxicity (Monitor LFT)

-No contraindications on US labeling

-Canada labeling says to watch for hypersensitivity.

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Thyrotropinomas

Somatostatin analogs: octreotide, lanreotide

Malignancies

Temozolamide

Temozolomide

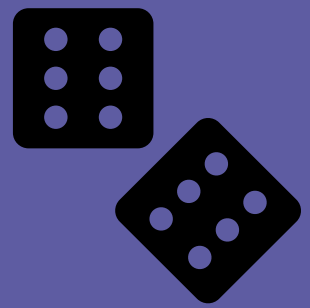
Antineoplastic agent

Alkylating agent

Plt should be >100,000 prior to administration

-Oral: 150-200mg/daily, consecutively repeated cycles (5 days of 28 days)

-May also follow Stupp protocol



-Many possible side-effects but typically tolerated well

-Monitor for: bone marrow suppression, hepatotoxicity, pneumocystis pneumonia

-Hypersensitivity

So you had surgery, now you might need……

https://pitchfork.com/features/podcast/the-replacements-tim-reissue/

The Replacements

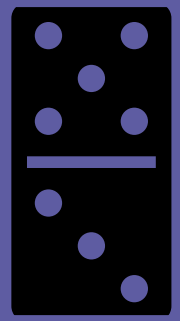
Hydrocortisone

-Glucocorticoid

-Short acting

-Biologic dosing

-15-25mg orally, daily, divided into 2-3 doses, decreasing dosing



-Adrenal suppression

-Immunosuppression

-Titrate off appropriately

-Hypersensitivity

-Systemic fungal infections

Desmopressin

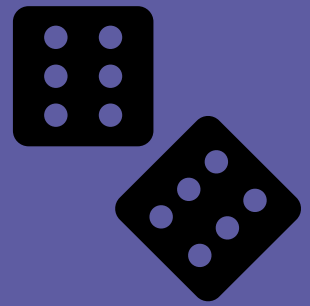
-Posterior pituitary hormone

-May be administered IV, SC, Intranasal, Oral, or Sublingual

-Acute settings: varies, 0.25 to 1mcg every 12 to 24 hours

-Oral: 0.05 to 0.2mg per dose

-Dose may be adjusted for nocturia, daytime dose maybe adjusted for daytime polyuria



-hyponatremia

-xerostomia

-Serious caution with renal impairment

-Hypersensitivity

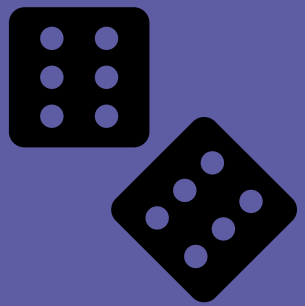
Levothyroxine

-Synthetic T4

-Correlate dosage to lean body mass vs. body weight.

-Average maintenance dose is around 1.6 mcg/kgday

-The entire hypothalamic>pituitary>adrenal axis should be evaluated prior to initiation of therapy.



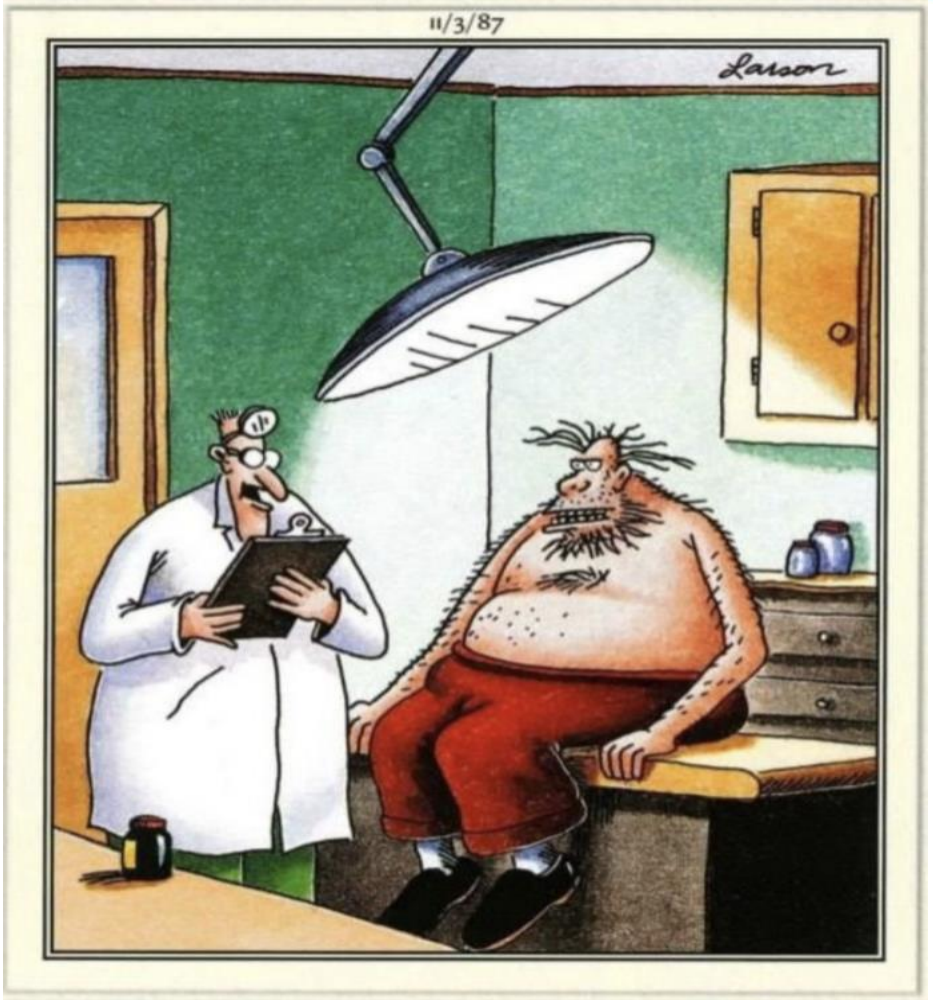
-Cardiovascular effects may result from overtreatment. Monitor for palpitations, tachycardia, dyspnea

-Uncorrected adrenal insufficiency

-

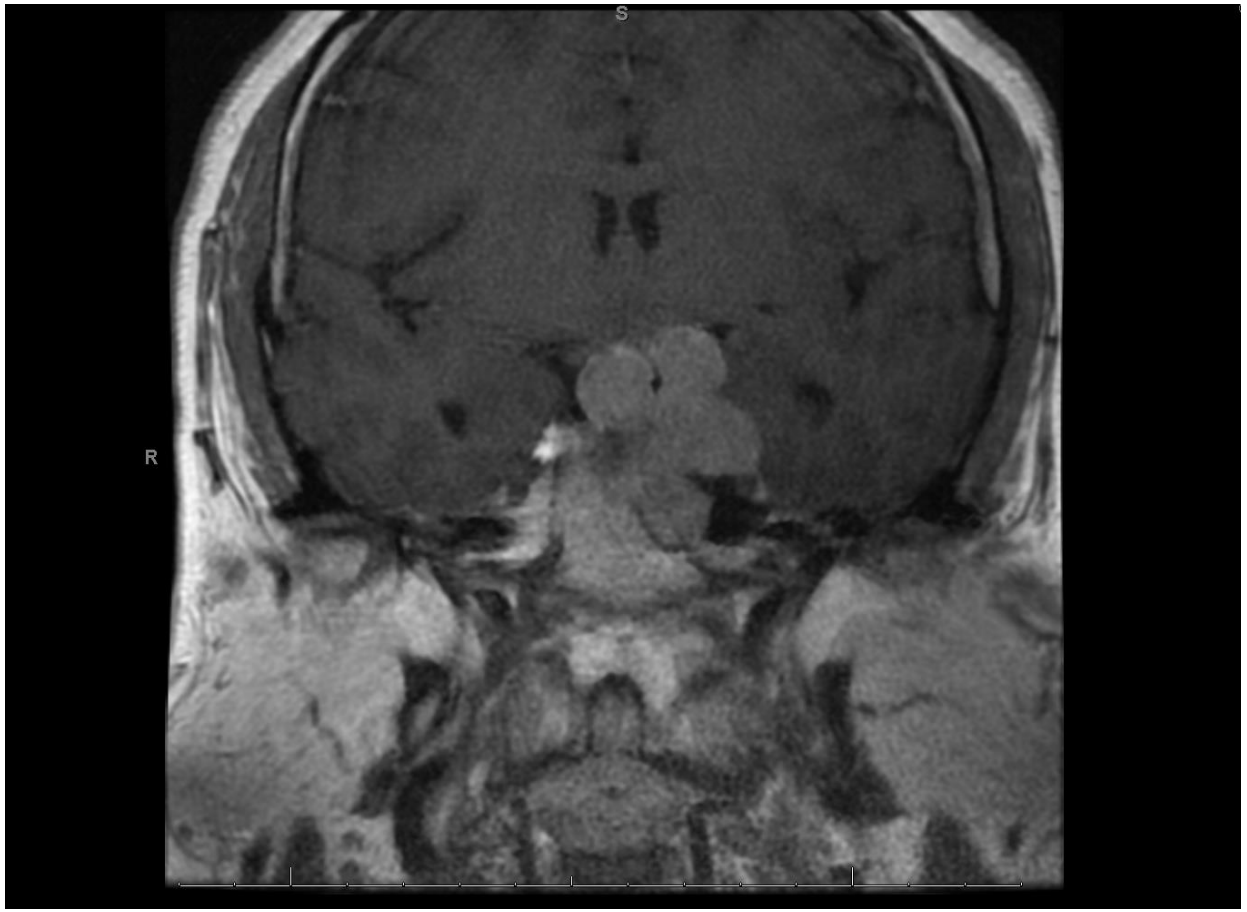
The Rest

- LH/FSH Deficiency
  - -Testosterone
  - -Estradiol
- GH Deficiency
  - -somatropin
- Prolactin deficiency



Case 1

- Patient is a 30-year-old man who initially presented to the emergency department with complaints of nausea, vomiting, and headache that had worsened over the last month. An MRI was completed and….



Case 1

During that ED/obs stay he was found to have the following labs:

Prolactin 4.1-28.4ng/mL……..2860
LH 2.6-8.0 mIU/MI…….. 1.6
TSH 0.350-4.890 UI/mL ……8.640
IGF-1 101-307 ng/mL ……79
Testosterone 341-1874 ng/dL ……101.0

Case 1

- He was started on Cabergoline 0.5mg twice weekly and continued on that dose for 3 months. During that time he was seen on an outpatient basis by both neurosurgery and endocrinology.
- Surgery deferred due to medical therapy.
- Labs were re-evaluated for downtrend.
- Prolactin was found to be 30(vs. 2800!) on recheck after two months of therapy.

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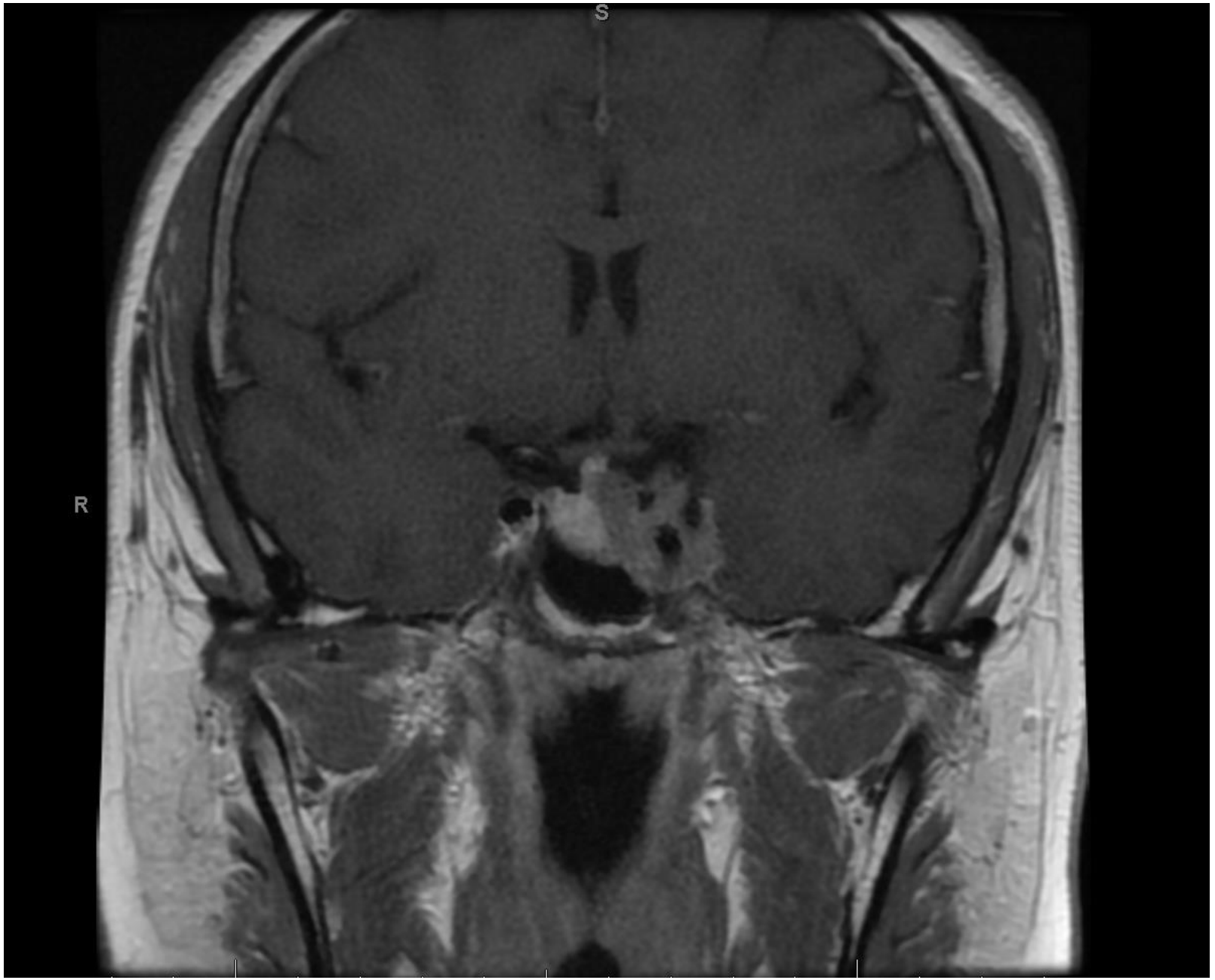
Case 1



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Questions?

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