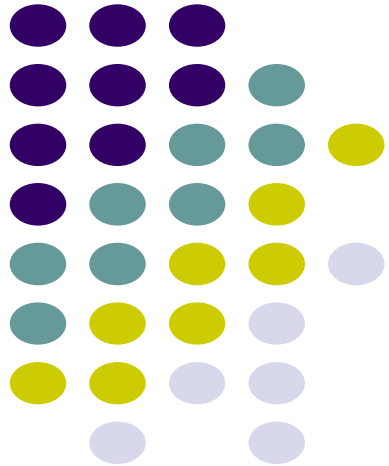
Case 2

Adrenal myelolipoma in CAH patient



Congenital Adrenal hyperplasia

- Autosomal recessive disorders
- Deficient adrenal corticosteroid biosynthesis
- Most common type is 21-hydroxylase deficiency (90-95% of CAH case)
- Incidence 1 in 10,000 to 1 in 15,000 live births

William textbook of Endocrinology, 14th edition

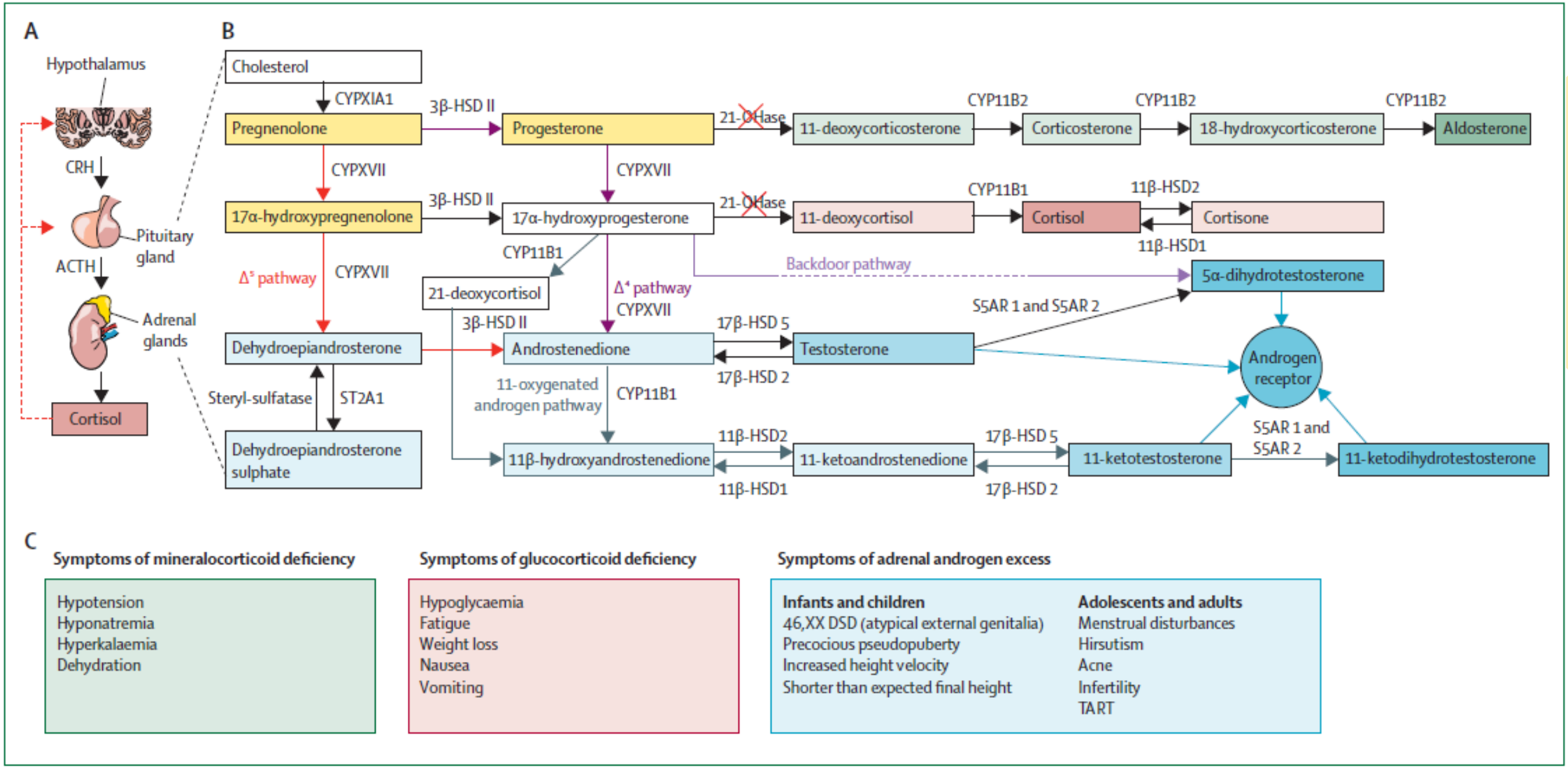


Figure 1: **Steroid synthesis pathways in congenital adrenal hyperplasia due to 21-OHase deficiency**

Lancet 2023; 401: 227–44

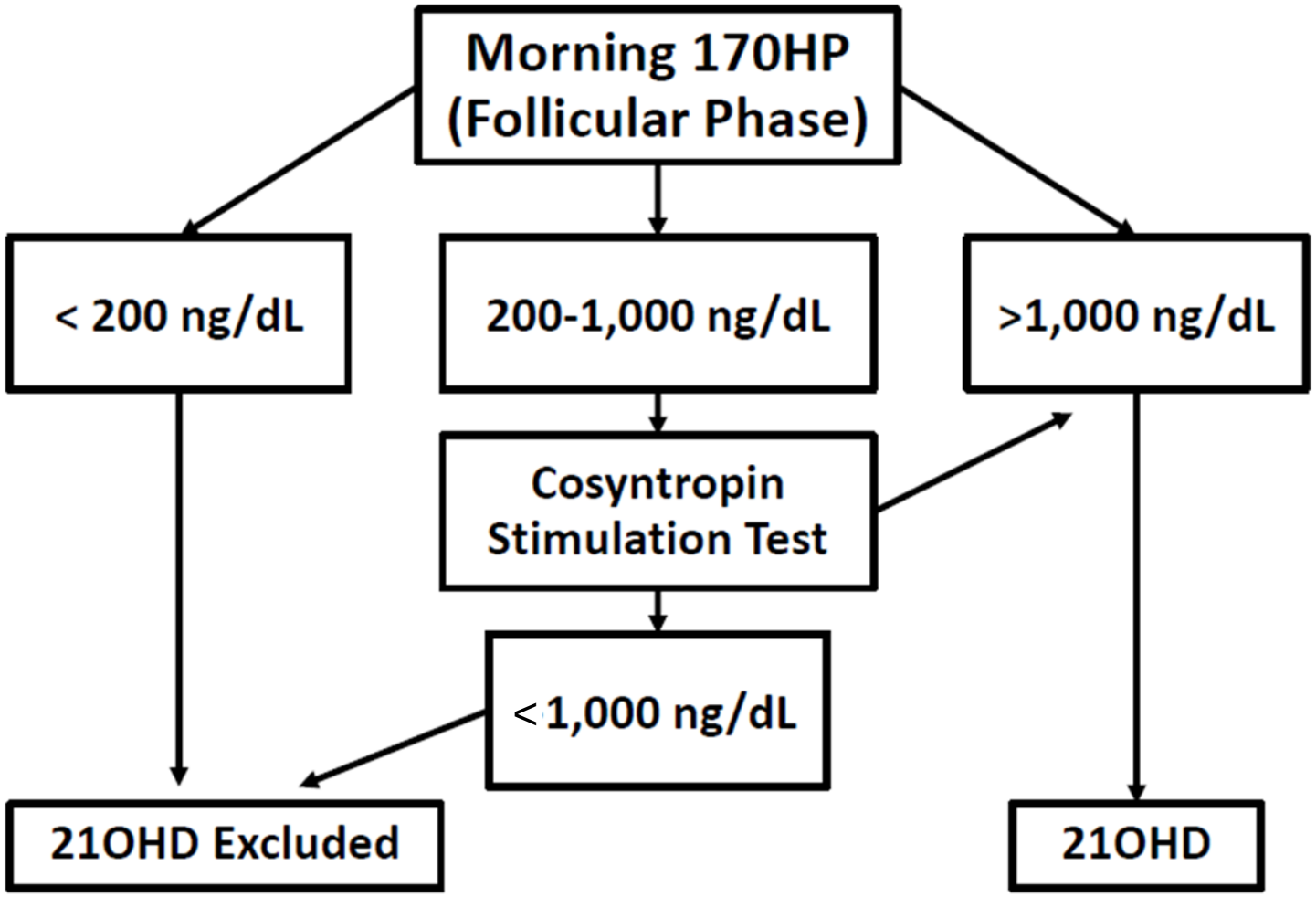
TABLE 15.23 Forms of 21-Hydroxylase Deficiency

Phenotype	Classic Salt Wasting	Simple Virilizing	Nonclassic
Age at diagnosis	Newborn to 6 mo	*Female:* Newborn to 2 yr *Male:* 2–4 yr	Child to adult
Genitalia	*Female:* Ambiguous *Male:* Normal	*Female:* Ambiguous *Male:* Normal	*Female:* Virilized *Male:* Normal
Incidence	1:20,000	1:60,000	1:1000
Hormones			
Aldosterone	Reduced	Normal	Normal
Renin	Increased	Normal or increased	Normal
Cortisol	Reduced	Reduced	Normal
17OHP	>50,000 ng/dL	10,000-50,000 ng/dL	1000-10,000 ng/dL (ACTH stimulation)
Testosterone	Increased	Increased	Variable, increased
Growth	–2 to –3 SD	–1 to –2 SD	Probably normal
21-Hydroxylase activity (% of wild type)	0	1–5	5–20
Typical *CYP21A2* mutations	Deletions, conversions, nt656g G110Δ8nt, R356W I236N, V237E, M239K, Q318X	I172N Intron 2 splice site (nt656g)	V281L P30L

17OHP, 17-Hydroxyprogesterone; *ACTH,* adrenocorticotropic hormone; *SD,* standard deviation.

William textbook of Endocrinology, 14th edition

Diagnosis



J Clin Endocrinol Metab, November 2018, 103(11):1–46

Adrenal myelolipoma in CAH patient

- The prevalence of adrenal tumors: 29.3% of patient with CAH
- Prevalence of myelolipoma: 7.4% of patient with CAH
- Prevalence of adrenal adenoma : 11% of patient with CAH
- The median (range) age : 36 (12-60) years
- In patients with myelolipomas, 93.5% had an undiagnosed or poorly managed CAH.

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Adrenal myelolipoma in CAH patient

- Chronic loss of negative feedback and elevated ACTH levels can lead to adrenal enlargement, nodule formation, and zonal disruption

Adrenal myelolipoma:

-The pathogenesis of these tumors is unknown.

-Benign and non steroid-producing tumor

-Tend to grow to massive size

Adrenal myelolipoma

- Myelolipomas are composed of mature adipocytes and trilinear hematopoietic cells just as the properly functioning bone marrow and the extramedullary hematopoiesis (EMH)

Myelolipoma: normal BM, encapsulated well circumscribed

EMH: occurs in hematological conditions, not circumscribed and fat are not obligated

Campbell Urology, 12th edition

Indication for surgery in patient with myelolipoma

- Functionally active
- Large tumor > 7 cm
- Local symptoms

Campbell Urology, 12th edition

First-line glucocorticoid replacement threrapies

	Prediatric		Adult	
	Daily dose	Dose frequency	Daily dose	Dose frequency
Hydrocortisone	8-12 mg/m^2 (Infants) 10-15 mg/m^2 (children) 10-17 mg/m^2 (adolescent)	3 or 4 times a day	15-30 mg	3 times a day
Fludrocortisone	0.01- 0.1 mg	1 or 2 times a day	0.05- 0.2 mg	1 or 2 times a day
Sodium chloride	1-2 g (17-34 mEq) in the first years of life	Devided into several feedings	-	-
Antiandrogenic oral contraceptive pill	Suitable for female adolescent		Suitable for female adult	

Lancet 2023; 401: 227–44

Alternative glucocorticoid replacement threrapies

	Adult	
	Daily dose	Dose frequency
Hydrocortisone+ prednisolone or dexamethasone	15-30 mg hydrocortisone+ either 1-2.5 mg prednisolone or 0.25 mg dexamethasone	Hydrocortisone 2 or 3 times a day Prednisolone or dexamethasone once a day at bedtime
Prednisolone	4-7.5 mg	2 times a day
Dexamethasone	0.25-0.5 mg	once a day at bedtime or in the early morning
Plenadren (modified –release hydrocortisone and sustained action)	15-25 mg	2 times a day

Lancet 2023; 401: 227–44

Follow up

Markers	Prediatric		Adult	
	Infants Weekly in the first month Then q 4-8 weeks	**Children** q 3 months	**Adolescents** q 4-6 months	**Adults** q 6-12 months
17 OHP (ULN up to< 36 nmol/L)	✓	✓✓	✓✓	✓✓
Testosterone (normal range)	✓	✓✓	✓✓	✓✓
Androstenedione (normal range)	✓	✓✓	✓✓	✓✓
Androstenedione to testosterone ratio (<0.5 in M, <2 in F)	-	-	✓	✓✓

Lancet 2023; 401: 227–44

Follow up

Markers	Prediatric		Adult	
	Infants Weekly in the first month Then q 4-8 weeks	**Children** q 3 months	**Adolescents** q 4-6 months	**Adults** q 6-12 months
SHBG in women (for calculate bioavailable of testosterone)	-	-	✓	✓✓
DHEAS (low to suppressed in patients who received GC)	✓	✓	✓	✓
Gonadotropins	-	✓	✓✓	✓✓
Progesterone (<0.6 ng/ml during follicular phase for woman trying to conceive)	-	-	✓	✓✓
Sodium and Potassium	✓	✓	✓	✓
Renin and PRA (upper normal)	-	✓	✓	✓
FBG, HbA1C, Cholesterol, and TG	-	-	✓	✓

Follow up Imaging

- Adrenal imaging for individuals with classic CAH who have clinical evidence of an adrenal mass, poor disease control, a lapse in treatment of several years, or lack of response to intensified therapy.
- In males with classic CAH, periodic testicular ultrasound to assess for the development of TARTs was recommended.
- In women ovarian adrenal rest tissue is usually not detectable by conventional imaging (ie, ultrasound and MRI).

J Clin Endocrinol Metab, November 2018, 103(11):4043–4088

Lancet 2023; 401: 227–44

THANK YOU