

**Table 72. Clinical and Biochemical Features of Congenital Adrenal Hyperplasia (CAH)**

Enzyme defect	Sexual Ambiguity		Additional Clinical Manifestations	Predominant Steroids
	Female	Male		
Desmolase	—	+	Salt wasting	...
3 $\beta$ -Hydroxysteroid dehydrogenase	+	+	Salt wasting	17-OH-pregnenolone, DHEA
21-Hydroxylase	+	—	Salt wasting	17-OH-progesterone, androstenedione
11-Hydroxylase	+	—	Hypertension	11-Deoxycortisol
17-Hydroxylase	—	+	Hypertension	DOC, corticosterone

DHEA, dehydroepiandrosterone; DOE, deoxycorticosterone.

**Table 73. Normal Serum Adrenal Steroid Levels in Newborn Infants**

Steroid	Preterm Sick		Preterm Well	Full Term
	24–28 Weeks	31–35 Weeks	31–35 Weeks	
Cortisol (mcg/dL)	7.5 $\pm$ 4	6 $\pm$ 2.7	6.9 $\pm$ 3.8	6.2 $\pm$ 3.9
17-OH-Preg (ng/dL)	1794 $\pm$ 1818	1395 $\pm$ 694	942 $\pm$ 739	245 $\pm$ 291
17-OH-Pro (ng/dL)	651 $\pm$ 661	373 $\pm$ 317	169 $\pm$ 95	36 $\pm$ 13 <sup>a</sup>
11-deoxycortisol (ng/dL)	662 $\pm$ 548	294 $\pm$ 239	111 $\pm$ 62	87 $\pm$ 42
DHEA (ng/dL)	1872 $\pm$ 4038	675 $\pm$ 502	920 $\pm$ 1227	286 $\pm$ 238
DHEAS (mcg/dL)	467 $\pm$ 312	459 $\pm$ 209	341 $\pm$ 93	162 $\pm$ 88
Androstenedione (ng/dL)	479 $\pm$ 1032	206 $\pm$ 86	215 $\pm$ 134	149 $\pm$ 67

Data based on information in Lee MM, Rajabopalan L, Berg G, et al. Serum adrenal steroid concentrations in premature infants. *J Clin Endocrinol Metab.* 1989;69:1133–1136, and in Wiener D, Smith J, Dahlem S, et al. Serum adrenal steroid levels in healthy term 3-day-old infants. *J Pediatr.* 1987;110(1):122–124.

17-OH-Preg, 17-OH-pregnenolone; 17-OH-Pro, 17-OH-progesterone; DHEA, dehydroepiandrosterone; DHEAS, dehydroepiandrosterone sulfate.  
<sup>a</sup> 17-OH-Pro values in full-term sick newborns may be double or triple the baseline values. No data are available for other steroid hormones in sick full-term infants.

**Table 74. Pharmacokinetics of Common Insulin Preparations**

Insulin Preparation	Onset (Hours)	Peak (Hours)	Duration of Action (Hours)
Ultra-rapid-acting (Lispro)	0.25–0.50	1–2	2–3
Short-acting (Regular, Semilente)	0.5–1.0	2–4	4–6
Long-acting (NPH, Lente)	2–4	6–12	18–24
Very long-acting (Ultralente)	6–10	18–24	24–36

NPH, neutral protein Hagedorn insulin.

**Table 75. Normal Thyroid Hormone Levels**

T <sub>4</sub>	Total	7.0–15.0 mcg/dL
	Free	0.8–2.3 ng/dL
T <sub>3</sub>		100–250 ng/dL
TSH		0.5–5.0 mcg/dL

**Table 76. Normal Ranges for Gonadotropin and Sex Steroid Levels: Females**

	LH (mIU/mL)	FSH (mIU/mL)	Estradiol (ng/dL)	Testosterone (ng/dL)
0–1 year	0.02–7.0	0.24–14.2	0.5–5.0	<10
Prepubertal	0.02–0.3	1.0–4.2	<1.5	<3–10
Tanner 2	0.02–4.7	1.0–10.8	1.0–2.4	7.0–28
Tanner 3	0.10–12.0	1.5–12.8	0.7–6.0	15–35
Tanner 4	0.4–11.7	1.5–11.7	2.1–8.5	13–32
Tanner 5	0.4–11.7	1.0–9.2	3.4–17.0	20–38
Adult	...	...	...	10–55
Follicular phase	2.0–9.0	1.8–11.2	3.0–10.0	...
Midcycle	18.0–49	6.0–35.0	...	...
Luteal phase	2.0–11.0	1.8–11.2	7.0–30.0	...

FSH, follicle-stimulating hormone; LH, luteinizing hormone.

**Table 77. Normal Ranges for Gonadotropin and Sex Steroid Levels: Males**

	LH (mIU/mL)	FSH (mIU/mL)	Estradiol (ng/dL)	Testosterone (ng/dL)
0–1 year	0.02–7.0	0.16–4.1	1.0–3.2	<10
Prepubertal	0.02–0.3	0.26–3.0	<1.5	<3–10
Tanner 2	0.2–4.9	1.8–3.2	0.5–1.6	18–150
Tanner 3	0.2–5.0	1.2–5.8	0.5–2.5	100–320
Tanner 4	0.4–7.0	2.0–9.2	1.0–3.6	200–620
Tanner 5	0.4–7.0	2.6–11.0	1.0–3.6	350–970
Adult	1.5–9.0	2.0–9.2	0.8–3.5	350–1,030

FSH, follicle-stimulating hormone; LH, luteinizing hormone.

**Table 78. Classification of Total and LDL Cholesterol Levels in Children and Adolescents from Families with Hypercholesterolemia or Premature Cardiovascular Disease**

Category	Total Cholesterol, mg/dL	LDL Cholesterol, mg/dL
Acceptable	<170	<110
Borderline	170–199	110–129
High	≥200	≥130

**Table 79. Causes and Management of Rickets**

Cause	Management
<b>Calcium Deficiency</b>	
Low intake	<6 months of age 400 mg/d 6–12 months of age 600 mg/d 1–10 years of age 800 mg/d
Extreme prematurity (birth weight <1,500 g)	Adjust intake to 200 mg/kg/d
Steatorrhea	25-OH-D <sub>3</sub> (5–7 mcg/kg/d) if serum levels are low and supplement dietary calcium between 25 and 100 mg/kg/d
Anticonvulsant (Phenobarbital or phenytoin)	<b>Calcium</b> <6 months of age 400 mg/d 6–12 months of age 600 mg/d 1–10 years of age 800 mg/d
Renal tubular acidosis	<b>Vitamin D</b> 200 IU/d of ergocalciferol Base supplement: 3–10 mM/kg/d as NaHCO <sub>3</sub> or citrate
<b>Vitamin D Deficiency</b>	
Insufficient UV light exposure	200 IU/d of vitamin D of ergocalciferol
Breastfeed infants who are not supplemented with vitamin D	200 IU/d of vitamin D of ergocalciferol
Liver disease	4,000–8,000 IU/d ergocalciferol
Renal disorders	4,000–40,000 IU/d of Calcitriol
Nutritional rickets and osteomalacia	1,000–5,000 IU/day of ergocalciferol
Vitamin D–dependent rickets	3,000–5,000 IU/d of Calcitriol
Vitamin D–resistant rickets	40,000–80,000 IU/d of ergocalciferol with phosphate supplements, daily dosage is increased at 3–4 month intervals in 10,000–20,000 IU increments
<b>Phosphorus Deficiency</b>	
Diet (limited to premature infants)	Adjust formula or parenteral source to give 10 mg/kg/d
Antacid excess	Alternative gastric acid control
Excessive phosphaturia from tubular dysfunction	Supplemental P and calcitriol if low

**Table 80. Classification of Rickets and Vitamin D Metabolite Levels**

	Calcium	Phosphorus	Alkaline Phosphate	25 (OH)D
Deficient synthesis and supply	N or ↓	↓	↑	↓
No sunlight				
Poor diet				
Immaturity				
Malabsorption	N or ↓	↓	↑	↓
Liver disease	N or ↓	↓	↑	↓
Chronic renal failure	N or ↓	↑	↑	N
Vitamin D–dependent rickets (recessively inherited)	↓	↓	↑	N
Vitamin D–resistant rickets (sex-linked dominant)	N	↓	↑	N
Renal tubular disorders (defect of phosphate reabsorption)	N	↓	↑	N

N, normal; ↓, decreased; ↑, increased.