REFERENCE VALUES FOR COMMON LABORATORY TESTS[1]

Serum Chemistries		Reference Range
Albumin	Premature 1 day	1.8–3 g/dL
	Full-term < 6 days	2.5–3.9 g/dL
	8 days–1 year	1.9–4.9 g/dL
	1–3 years	3.4–5.2 g/dL
	4–19 years	3.5–5.6 g/dL
Ammonia	Newborn – Child Adult	29-150 mcg/dL 15–60 mcg/dL
Amylase	1–19 years	30–100 units/L
Alanine aminotransferase (ALT)	≤ 7 days	6–40 units/L
	8–30 days:	
	Male	*10 to 40 units/L*
	Female	*8–32 units/L*
	1–12 months	12–45 units/L
	1–19 years	5–55 units/L
Alkaline phosphatase (ALP)	1-12 months	150-420 units/L
	1–9 years	100–420 units/L
	10–11 years	140–560 units/L
	12–13 years:	
	Male	*100–495 units/L*
	Female	*100–420 units/L*
	14–15 years:	
	Male	*100–525 units/L*
	Female	*70–320 units/L*
	16–19 years:	
	Male	*65–260 units/L*
	Female	*50–320 units/L*
Aspartate aminotransferase (AST)	Newborn ≤ 7 days:	
	Male	*30–150 units/L*
	Female	*24–150 units/L*
	8 days – < 12 months	9–80 units/L
	1–3 years	20–60 units/L
	3–9 years	15–50 units/L
	10–15 years	10–40 units/L
	16–19 years:	
	Male	*15–45 units/L*
	Female	*5 to 30 units/L*
Bilirubin, direct	Newborn	< 0.6 mg/dL
	≥ 1 month	< 0.2 mg/dL
Bilirubin, total	Cord blood	< 2 mg/dL
	Premature < 6 days	< 16 mg/dL
	Full-term < 6 days	< 12 mg/dL
	1 month– < 12 months	< 2 mg/dL
	1–19 years	< 1.5 mg/dL
Blood urea nitrogen (BUN)	All ages	2–20 mg/dL
Calcium, ionized	Cord blood	5–6 mg/dL
	Newborn 3–24 hours	4.3–5.1 mg/dL
	Newborn 24–38 hours	4–4.7 mg/dL
	≥ 2 days	4.8–4.92 mg/dL
Calcium, total serum	Cord blood	9.5–11.5 mg/dL
	Newborn 3–24 hours	9–10.6 mg/dL
	Newborn 24–48 hours	7–12 mg/dL
	4–7 days	6.7–10.9 mg/dL
	Child	8.8–10.8 mg/dL
	Adolescent–Adult	8.4–10.2 mg/dL
Carbon dioxide (venous) (CO_2)	All ages	20–30 mEq/L
Chloride (Cl)	All ages	95–108 mEq/L
C-reactive protein (CRP)	All ages	< 0.8 mg/dL
Creatine kinase (CK)	Cord blood	70–380 units/L
	Newborn 5–8 hours	214–1175 units/L
	Newborn 24–33 hours	130–1200 units/L
	Newborn 72–100 hours	87–1578 units/L
	Adult	5–200 units/L
Creatinine, serum (SCr)	Cord blood	0.6–1.2 mg/dL
	Newborn	0.3–1 mg/dL
	Child	0.3–0.7 mg/dL
	Adolescent	0.5–1 mg/dL
	Adult male	0.9–1.2 mg/dL
	Adult female	0.6-1.1 mg/dL
Creatinine (clearance) (CrCl)	All ages	90–140 mL/minute/1.73 m^2
γ-Glutamyl transpeptidase (GGT)	Newborn– < 2 months	12–147 units/L
	2– < 4 months	8–90 units/L
	4 months – 19 years	5–32 units/L
	Adult	7-49 units/L
Glucose, serum	Cord blood	45–96 mg/dL
	Premature	20–60 mg/dL
	Newborn 1 day	40–60 mg/dL
	Newborn > 1 day	50–90 mg/dL
	Child	60–100 mg/dL
	Adult	70–105 mg/dL
Hemoglobin A1C (A1C)	All ages	4%–6%
Lactate dehydrogenase (LDH)	Newborn	180–2000 units/L
	1 month – < 1 year	170–580 units/L
	1–9 years	110–500 units/L
	10–19 years	100–330 units/L
Lipase	1–18 years	3–216 units/L
Magnesium	All ages	1.5–2.5 mEq/L
Osmolality, serum	All ages	266–295 mOsm/kg
Phosphorus (inorganic) (PO_4)	Newborn 0–5 days	4.5–9 mg/dL
	1–3 years	3.8–6.5 mg/dL
	4–11 years	3.2–5.8 mg/dL
	12–15 years	2.9–5.4 mg/dL
	16–19 years	2.4–4.7 mg/dL
Potassium (K)	Newborn	3.7–7.2 mEq/L
	1– < 3 months	4.0–6.2 mEq/L
	3 months–1 year	3.4–5.6 mEq/L
	1–16 years	3.5–5.1 mEq/L
Prealbumin	> 1 month	8–42 mg/dL
Sodium (Na)	All ages	130–147 mEq/L
Transferrin saturation	All ages	10–50%
Uric acid, serum	Newborn–14 years	1–7 mg/dL

Age	Hemoglobin (g/dL)	Hematocrit (%)	RBC ($\times 10^6$ cells/mm^3)	MCV (fL)	MCH (pg/cell)	MCHC (g/dL)	Plt (mm^3)	WBC ($\times 10^3$ cells/mm^3)
≤ 30 days	15–24	44–70	4–5.5	99–115	33–39	30–36	84–478[a]	9.1–34
1–23 mo	10.5–14	32–42		72–88	24–30		150–450	6–17
2–9 yr	11.5–14.5	33–43		76–90	25–31			4–15.5
10–17 yr (male)	12.5–16.1	36–47		78–95	26–32			4–13.5
10–17 yr (female)	12–15	35–45		78–95	26–32			
≥ 18 yr (male)	13.5–18	42–52		78–100	27–31			
≥ 18 yr (female)	12.5–16	37–47		78–100	27–31			

[a]Value for ages 0–7 days; for age > 7 days, similar to range for all patient ages.

Blood Gases

	Arterial	Capillary	Venous
pH	7.35–7.45	7.35–7.45	7.32–7.42
Partial pressure of carbon dioxide (PCO_2)	32–48 mm Hg	35–45 mm Hg	38–52 mm Hg
Partial pressure of oxygen (PO_2)	70–108 mm Hg	60–80 mm Hg	24–48 mm Hg
Oxygen saturation (SaO_2)	90–95%	90–95%	40–70%
Serum bicarbonate (HCO_3)	19–28 mEq/L	19–25 mEq/L	19–25 mEq/L

[a]Values given in this table are commonly accepted reference ranges compiled from many sources. Patient-specific goals may differ depending on age, sex, clinical condition, and the laboratory methodology used to perform the assay.

Information from: Pediatric and Neonatal Dosage Handbook, 21st ed. Hudson, Ohio: Lexicomp, 2014; AMA Manual of Style, 10th ed. New York: Oxford University Press, 2007; Ayers P, Warrington L. Diagnosis and treatment of simple acid-base disorders. Nutr Clin Pract 2008;23:122-7; DiPiro JT, Talbert RL, Yee GC, et al., eds. Pharmacotherapy: A Pathophysiologic Approach, 8th ed. New York: McGraw-Hill Medical, 2011; Lee M. Basic Skills in Interpreting Laboratory Data, 4th ed. Bethesda, MD: American Society of Health-System Pharmacists, 2009; and MUSC Health, Laboratory Services. Test Directory and Specimen Collection Handbook. Charleston, SC: MUSC Pathology and Laboratory Services, 2008–2009; The Harriet Lane Handbook, 21st ed. Philadelphia, Pennsylvania: Elsevier, 2018.