

# HEMATOLOGICAL REFERENCE VALUES (Part 1 of 2)

Analyte	Reference value	
	Conventional units	SI units
<b>COAGULATION PROFILE</b>		
D-Dimer	≤ 300 ng/mL	≤ 300 µg/L
Fibrinogen	150–350 mg/dL	1.5–3.5 g/L
Partial thromboplastin time, activated (aPTT)	25–35 sec	—
Prothrombin time (PT)	11–13 sec	—
Thrombin time	18.5–24 sec	—
<b>COMPLETE BLOOD COUNT (CBC)</b>		
Erythrocyte sedimentation rate (ESR)		
Females	0–20 mm/h	0–20 mm/h
Males	0–15 mm/h	0–20 mm/h
Folic acid		
RBC	160–855 ng/mL	362–1937 nmol/L
Serum	2.5–20 ng/mL	5.7–45.3 nmol/L
Hemoglobin (Hgb)		
Females	12–16 g/dL	120–160 g/L
Males	14–17 g/dL	140–170 g/L
Hematocrit (Hct)		
Females	36–47%	—
Males	41–51%	—
Mean Corpuscular Hemoglobin (MCH)	28–32 pg	—
Mean Corpuscular Hemoglobin Concentration (MCHC)	32–36 g/dL	320–360 g/L
Mean Corpuscular Volume (MCV)	80–100 fL	—
Platelet (Plt)	150–350 x 10 <sup>3</sup> /µL	150–350 x 10 <sup>9</sup> /L
Red Blood Cell (RBC)	4.2–5.9 x 10 <sup>6</sup> cells/µL	4.2–5.9 x 10 <sup>12</sup> cells/L
Reticulocyte		
Percentage	0.5–1.5%	—
Absolute	23–90 x 10 <sup>3</sup> /µL	23–90 x 10 <sup>9</sup> /L
Vitamin B <sub>12</sub>	200–800 pg/mL	148–590 pmol/L
White Blood Cell (WBC)	4.5–11 x 10 <sup>3</sup> cells/µL	4.5–11 x 10 <sup>9</sup> cells/L
Neutrophils (segs)	2.6–8.5 x 10 <sup>3</sup> cells/µL	2.6–8.5 x 10 <sup>9</sup> cells/L
Neutrophils (bands)	0–1.2 x 10 <sup>3</sup> cells/µL	0–1.2 x 10 <sup>9</sup> cells/L
Lymphocytes	0.77–4.5 x 10 <sup>3</sup> cells/µL	0.77–4.5 x 10 <sup>9</sup> cells/L
Monocytes	0.14–1.3 x 10 <sup>3</sup> cells/µL	0.14–1.3 x 10 <sup>9</sup> cells/L
Eosinophils	0–0.55 x 10 <sup>3</sup> cells/µL	0–0.55 x 10 <sup>9</sup> cells/L
Basophils	0–0.22 x 10 <sup>3</sup> cells/µL	0–0.22 x 10 <sup>9</sup> cells/L
<b>ELECTROLYTES</b>		
Calcium	9–10.5 mg/dL	2.2–2.6 mmol/L
Chloride	98–106 mEq/L	98–106 mmol/L
Magnesium	1.5–2.4 mg/dL	0.62–0.99 mmol/L
Phosphorus, inorganic	3.0–4.5 mg/dL	0.97–1.45 mmol/L
Potassium	3.5–5 mEq/L	3.5–5 mmol/L
Sodium	136–145 mEq/L	136–145 mmol/L

*(continued)*

# HEMATOLOGIC REFERENCE VALUES (Part 2 of 2)

Analyte	Reference value	
	Conventional units	SI units
<b>HEPATIC FUNCTION</b>		
Alanine aminotransferase (ALT)	0–35 U/L	0–0.58 pkat/L
Albumin	3.5–5.4 g/dL	35–54 g/L
Alkaline phosphatase (ALP)	36–150 U/L	0.5–2.5 $\mu$ kat/L
Aspartate aminotransferase (AST)	0–35 U/L	0–0.58 pkat/L
Bilirubin		
Direct	0–0.3 mg/dL	0–5.1 $\mu$ mol/L
Total	0.3–1.2 mg/dL	5.1–20.5 $\mu$ mol/L
Protein, total	6–7.8 g/dL	60–78 g/L
<b>IRON STUDIES</b>		
Ferritin	Females: 30–200 ng/mL Males: 30–300 ng/mL	Females: 30–200 $\mu$ g/L Males: 30–300 $\mu$ g/L
Iron	60–160 $\mu$ g/dL	11–29 $\mu$ mol/L
Iron-binding capacity, total (TIBC)	250–460 $\mu$ g/dL	45–82 $\mu$ mol/L
Transferrin	212–360 mg/dL	2.1–3.6 g/L
Transferrin saturation	20–50%	—
<b>LIPID PANEL (DESIRABLE LEVEL)</b>		
High-density lipoprotein (HDL-C)	$\geq$ 40 mg/dL	$\geq$ 1.04 mmol/L
Low-density lipoprotein (LDL-C)	$\leq$ 130 mg/dL	$\leq$ 3.36 mmol/L
Total cholesterol (TC)	150–199 mg/dL	3.88–5.15 mmol/L
Triglycerides	< 250 mg/dL	< 2.82 mmol/L
<b>METABOLIC PANEL</b>		
Bicarbonate	23–28 mEq/L	23–28 mmol/L
Glucose		
Fasting	70–105 mg/dL	3.9–5.8 mmol/L
2hr postprandial	< 140 mg/dL	< 7.8 mmol/L
Hemoglobin A1c	4.7–8.5%	—
Lactic acid, venous	6–16 mg/dL	0.67–1.8 mmol/L
pH, blood	7.38–7.44	—
<b>RENAL FUNCTION</b>		
Creatinine, serum	0.7–1.3 mg/dL	61.9–115 $\mu$ mol/L
Urea nitrogen (BUN)	8–20 mg/dL	2.9–7.1 mmol/L
<b>THYROID PANEL</b>		
Thyroid-stimulating hormone (TSH)	0.5–5.0 $\mu$ IU/mL	0.5–5.0 mIU/L
Thyroxine (T4)		
Free	0.9–2.4 ng/dL	12–31 pmol/L
Total	5–12 $\mu$ g/dL	64–155 nmol/L
Triiodothyronine (T3)		
Uptake	25–35%	—
Total	70–195 ng/dL	1.1–3.0 nmol/L

**NOTES**  
**Key:**  $\mu$ kat = microkatal; pkat = picokatal; ALT: formerly serum glutamic pyruvic transaminase (SGPT)  
 AST: formerly serum glutamic oxaloacetic transaminase (SGOT)

## REFERENCES

Normal Laboratory Values. Merck Manual Professional Version. <https://www.merckmanuals.com/professional/resources/normal-laboratory-values/normal-laboratory-values>. Accessed April 2, 2020.