



NORMAL LABORATORY VALUES, Page 1 of 2

IMPORTANT NOTES: Each commercial laboratory has its own set of "normal" values, called "Normal Range" or "Reference Range" on your lab report. These values depend on the equipment or method used. Compare your results to the range shown on your lab report. Results that are "out of range" may not represent a problem. Your test results can be affected by several factors, including your age or gender, if you are pregnant, the time of day when the sample was taken, active infections, stage of HIV disease, and food (some test samples need to be taken after you have fasted - not eaten anything - for several hours). Where normal values for men and women are different, they are indicated as W for women and M for men. **Discuss "out of range" results with your health care provider.** The table below compares the units used in the United States with the "Système International d'Unités (SI units), a metric system used in many parts of the world. The last column, "To Convert US to SI Units," is the factor to multiply US lab values to convert them to SI units. To convert SI units to US units, divide the SI value by the conversion factor. See page 2 for a terminology list.

Laboratory Test	Normal Range in US Units	Normal Range in SI Units	To Convert US to SI Units		
ALT (Alanine aminotransferase)	W 7-30 units/liter M 10-55 units/liter	W 0.12-0.50 μ kat/liter M 0.17-0.92 μ kat/liter	x 0.01667		
Albumin	3.1 - 4.3 g/dl	31 - 43 g/liter	x 10		
Alkaline Phosphatase	W 30-100 units/liter, M 45-115 units/liter	W 0.5-1.67 μ kat/liter, M 0.75-1.92 μ kat/liter	x 0.01667		
Amylase (Serum)	53-123 units/liter	0.88-2.05 nkat/liter	x 0.01667		
AST (Aspartate aminotransferase)	W 9-25 units/liter M 10-40 units/liter	W 0.15-0.42 μ kat/liter M 0.17-0.67 μ kat/liter	x 0.01667		
Basophils	0-3% of lymphocytes	0.0-0.03 fraction of white blood cells	x 0.01		
Bilirubin - Direct	0.0-0.4 mg/dl	0-7 μ mol/liter	x 17.1		
Bilirubin - Total	0.0-1.0 mg/dl	0-17 μ mol/liter			
Blood pressure	Normal: 120/70 to 120/80 millimeters of mercury (mmHg). Top number is systolic pressure, when heart is pumping. Bottom number is diastolic pressure when heart is at rest. Blood pressure can be too low (hypotension) or too high (hypertension).		No conversion		
C peptide	0.5-2.0 ng/ml	0.17-0.66 nmol/liter	x 0.33		
Calcium, serum	8.5-10.5 mg/dl	2.1-2.6 mmol/liter	x 0.25		
Calcium, urine	0-300 mg/24hr	0.0-7.5 mmol/24hr	x 0.025		
CO ₂ (Bicarbonate)	20 - 32 mmol/L	20 - 32 mmol/L	No conversion		
Chloride	95 - 108 mmol/L	95 - 108 mmol/L	No conversion		
Cholesterol, Total & LDL	Total Cholesterol	LDL cholesterol	Total Cholesterol	LDL cholesterol	x0.02586
Desirable	<200 mg/dL	<100 mg/dL	<5.17 mmol/liter	<2.59 mmol/liter	
Marginal	200-239 mg/dL	100 - 159 mg/dL	5.17-6.18 mmol/liter	2.59 - 4.14	
High	>239 mg/dl	160 - 189 mg/dL	>6.18 mmol/liter	4.14 - 4.89	
Very High	--	>190 mg/dL	--	>4.91 mmol/liter	
HDL: Desirable	>60 mg/dL		>1.55 mmol/liter		
Moderate	40 - 60 mg/dL		1.03 - 1.55 mmol/liter		
Low (heart risk)	<40 mg/dL		<1.03 mmol/liter		
Cortisol: serum	0-25 μ g/dl (depends on time of day)	0-690 nmol/liter	x 27.59		
free (urine)	20-70 μ g/dl	55-193 nmol/24hr	x 2.759		
Creatine kinase	W 40-150 units/liter, M 60-400 units/liter	W 0.67-2.50 μ kat/liter, M 1.00-6.67 μ kat/liter	x 0.01667		
Creatinine (urine)	W 0.6 - 1.8 g/day M 0.8 - 2.4 g/day	W 5.3-15.9 mmol/day M 7.1-21.2 mmol/day	x 88.4		
DHEA	W 130-980 ng/dl M 180-1250 ng/dl	W 4.5-34.0 nmol/liter M 6.24-43.3 nmol/liter	x 0.03467		
DHEA Sulfate	W Pre-menopause: 12-535 μ g/dl W Post-menopause: 30-260 μ g/dl M 10-619 μ g/dl	W Pre-menopause: 120-5350 μ g/liter W Post-menopause: 300-2600 μ g/liter M 100-6190 μ g/liter	x 10		
Eosinophils	0-8% of white blood cells	0.0-0.8 fraction of white blood cells	x 0.01		
Erythrocyte sedimentation rate (Sed Rate)	W \leq 30 mm/h M \leq 20 mm/h	W \leq 30 mm/h M \leq 20 mm/h	No conversion		
Folate	3.1-17.5 ng/ml	7.0-39.7 nmol/liter	x 2.266		
Glucose, urine	<0.05 g/dl	<0.003 mmol/liter	x 0.05551		
Glucose, plasma	70-110 mg/dl	3.9-6.1 mmol/liter			
Gamma glutamyl transferase (GGT)	W \leq 45 U/L M \leq 65 U/L	W \leq 45 U/L M \leq 65 U/L	No conversion		

**NORMAL LABORATORY VALUES, Page 2**

Laboratory Test	Normal Range in US Units	Normal Range in SI Units	To Convert US to SI Units
Hematocrit	W 36.0% - 46.0% of red blood cells M 37.0% - 49.0% of red blood cells	W 0.36-0.46 fraction of red blood cells M 0.37-0.49 fraction of red blood cells	x 0.01
Hemoglobin	W 12.0-16.0 g/dl, M 13.0-18.0 g/dl	W 7.4-9.9 mmol/liter, M 8.1-11.2 mmol/liter	x 0.6206
Lactate dehydrogenase (LDH) (total)	≤ 270 U/L	≤ 4.5 μkat/liter	X 0.016667
Lactic acid	0.5-2.2 mmol/liter	0.5-2.2 mmol/liter	No conversion
Leukocytes (WBC)	4.5-11.0x10 ³ /mm ³	4.5-11.0x10 ⁹ /liter	No conversion
Lymphocytes	16-46% of white blood cells	0.16-0.46 fraction of white blood cells	x 0.01
Mean corpuscular hemoglobin (MCH)	25.0-35.0 pg/cell	25.0-35.0 pg/cell	No conversion
Mean corpuscular hemoglobin concentration (MCHC)	31.0-37.0 g/dl	310-370 g/liter	x 10
Mean corpuscular volume (MCV)	W 78-102 μm ³ M 78-100 μm ³	W 78-102 fl M 78-100 fl	No conversion
Monocytes	4-11% of white blood cells	0.04-0.11 fraction of white blood cells	x 0.01
Neutrophils	45-75% of white blood cells	0.45-0.75 fraction of white blood cells	x 0.01
Phosphorus	2.5 – 4.5 mg/dL	0.81 – 1.45 mmol/L	X 0.323
Platelets (Thrombocytes)	130 – 400 x 10 ³ /μL	130 – 400 x 10 ⁹ /L	No conversion
Potassium	3.4-5.0 mmol/liter	3.4-5.0 mmol/liter	No conversion
Red Blood Cell Count (RBC)	W 3.9–5.2x10 ⁶ /μL M 4.4–5.8x10 ⁶ /μL	W 3.9–5.2 x 10 ¹² /L M W 4.4 – 5.8 x 10 ¹² /L	No conversion
Sodium	135-145 mmol/liter	135-145 mmol/liter	No conversion
Testosterone, total (morning sample)	W 6-86 ng/dl M 270-1070 ng/dl	W 0.21-2.98 nmol/liter M 9.36-37.10 nmol/liter	x 0.03467
Testosterone, Unbound	Age 20-40 W 0.6-3.1, M 15.0-40.0 pg/ml Age 41-60 W 0.4-2.5, M 13.0-35.0 pg/ml Age 61-80 W 0.2-2.0, M 12.0-28.0 pg/ml	W 20.8-107.5, M 520-1387 pmol/liter W 13.9-86.7, M 451-1213 pmol/liter W 6.9-69.3, M 416-971 pmol/liter	x 34.67
Triglycerides (fasting)	Normal 40-150 mg/dl Borderline 150-200 mg/dl High 200-500 mg/dl Very High >500 mg/dl	0.45-1.69 mmol/liter 1.69 - 2.26 mmol/liter 2.26 - 5.65 mmol/liter >5.65 mmol/liter	x 0.01129
Urea, plasma (BUN)	8-25 mg/dl	2.9-8.9 mmol/liter	x 0.357
Urinalysis: pH	5.0-9.0	5.0-9.0	No conversion
Specific gravity	1.001-1.035	1.001-1.035	No conversion
WBC (White blood cells, Leukocytes)	4.5-11.0x10 ³ /mm ³	4.5-11.0x10 ⁹ /liter	No conversion

TERMINOLOGY: UNITS:

gram: common measurement of weight. Used in this table: pg (picograms), g (grams), mg (milligrams), etc. per liter

katal (kat): a unit of catalytic activity, used especially in the chemistry of enzymes. Used in this table: μkat (microkatal), nkat (nanokatal) per liter

micrometer (μm): a unit of length. Mean Corpuscular Volume is expressed in cubic micrometers

mole: also "gram molecular weight," a quantity based on the atomic weight of the substance. Many test results in the Système Internationale are expressed as the number of moles per liter. In US units, these measurements are usually in grams per liter. Used in this table: mmol (millimoles), μmol, (micromoles), nmol (nanomoles), pmol (picomoles) per liter

Some units of measurement include the following fractions and multipliers:

mega (M): 10 ⁶ or x1,000,000	milli (m): 10 ⁻³ or ÷1,000
kilo (k): 10 ³ or x1,000	micro (μ): 10 ⁻⁶ or ÷1,000,000
deca or deka: 10 ¹ or x10	nano (n): 10 ⁻⁹ or ÷1,000,000,000
deci (d): 10 ⁻¹ or ÷10	pico (p): 10 ⁻¹² or ÷1,000,000,000,000

Reviewed March 24, 2010