Normal Laboratory Values

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 biological sex, 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 people assigned female at birth (AFAB) and people assigned male at birth (AMAB) are different, they are indicated as F and M.

The table below compares the units used in the U.S. with the Système International d'Unités (SI units), a metric system used in many parts of the world. The last column, To Convert U.S. to SI Units, is the factor to multiply U.S. lab values to convert them to SI units. To convert SI units to U.S. units, divide the SI value by the conversion factor.

DISCUSS OUT OF RANGE RESULTS WITH YOUR HEALTHCARE PROVIDER

Laboratory Test	Normal Range in US Units	Normal Range in SI Units	To Convert U.S. to SI Units
ALT (Alanine aminotransferase)	F 7-30 units/L	F 0.12-0.50 µkat/L	x 0.01667
	M 10-55 units/L	M 0.17-0.92 µkat/L	
Albumin	3.1 - 4.3 g/dL	31 - 43 g/L	x 10
Alkaline Phosphatase	F 30-100 units/L M 45-115 units/L	F 0.5-1.67 µkat/L M 0.75-1.92 µkat/L	x 0.01667
Amylase (Serum)	53-123 units/L	0.88-2.05 nkat/L	x 0.01667
AST (Aspartate aminotransferase)	F 9-25 units/L	F 0.15-0.42 µkat/L	x 0.01667
	M 10-40 units/L	M 0.17-0.67 µkat/L	
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 µmol/L	x 17.1
Bilirubin - Total	0.0-1.0 mg/dL	0-17 µmol/L	
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/L	x 0.33
Calcium, serum	8.5-10.5 mg/dL	2.1-2.6 mmol/L	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	<200 mg/dL	<5.17 mmol/L	x 0.02586
Marginal	200-239 mg/dL	5.17-6.18 mmol/L	
High	>239 mg/dl	>6.18 mmol/L	
Cholesterol, LDL	<100 mg/dL	<2.59 mmol/L	
Marginal	100-159 mg/dL	2.59-4.14 mmol/L	
High	160-189 mg/dL	4.14 - 4.89 mmol/L	
Very High	>190 mg/dL	>4.91 mmol/L	
Cholesterol, HDL	>60 mg/dL	>1.55 mmol/L	
Moderate	40-60 mg/dL	1.03-1.55 mmol/L	
Low (heart risk)	<40 mg/dL	<1.03 mmol/L	
Cortisol: serum free (urine)	0-25 µg/dL (depends on time of day)	0-690 nmol/L	x 27.59
	20-70 µg/dL	55-193 nmol/24hr	x 2.759
Creatine kinase	F 40-150 units/L M 60-400 units/L	F 0.67-2.50 µkat/L M 1.00-6.67 µkat/L	x 0.01667
Creatinine (urine)	F 0.6-1.8 g/day M 0.8-2.4 g/day	F 5.3-15.9 mmol/day M 7.1-21.2 mmol/day	x 88.4
DHEA	F 130-980 ng/dL M 180-1250 ng/dL	F 4.5-34.0 nmol/L M 6.24-43.3 nmol/L	x 0.03467
DHEA Sulfate	F Pre-menopause: 12-535 µg/dL	F Pre-menopause: 120-5350 µg/L	x 10
	F Post-menopause: 30-260 µg/dL	F Post-menopause: 300-2600 µg/L	
	M 10-619 µg/dL	M 100-6190 µg/L	

Eosinophils	0-8% of white blood cells	0.0-0.8 fraction of white blood cells	x 0.01
Erythrocyte sedimentation rate (Sed Rate)	F £ 30 mm/h M £ 20 mm/h	F £ 30 mm/h M £ 20 mm/h	No conversion
Folate	3.1-17.5 ng/mL	7.0-39.7 nmol/L	x 2.266
Glucose, urine	<0.05 g/dl	<0.003 mmol/L	x 0.05551
Glucose, plasma	70-110 mg/dL	3.9-6.1 mmol/L	
Gamma glutamyl transferase (GGT)	F £ 45 U/L M £ 65 U/L	F £ 45 U/L M £ 65 U/L	No conversion

Laboratory Test	**Normal Range in U.S. Units**	**Normal Range in SI Units**	**To Convert US to SI Units**
Hematocrit	F 36.0-46.0% of red blood cells	F 0.36-0.46 fraction of red blood cells	x 0.01
	M 37.0-49.0% of red blood cells	M 0.37-0.49 fraction of red blood cells	
Hemoglobin	F 12.0-16.0 g/dL M 13.0-18.0 g/dL	F 7.4-9.9 mmol/L M 8.1-11.2 mmol/L	x 0.6206
Lactate dehydrogenase (LDH) (total)	£ 270 U/L	£ 4.5 µkat/L	X 0.016667
Lactic acid	0.5-2.2 mmol/L	0.5-2.2 mmol/L	No conversion
Leukocytes (WBC)	4.5-11.0 x 10^3/mm^3	4.5-11.0 x 10^9/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/L	x 10
Mean corpuscular volume (MCV)	F 78-102 $µm^3$ M 78-100 $µm^3$	F 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/L	3.4-5.0 mmol/liter	No conversion
Red Blood Cell Count (RBC)	F 3.9-5.2 x 10^6/µL M 4.4–5.8 x 10^6/µL	F 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)	F 6-86 ng/dL	F 0.21-2.98 nmol/liter	x 0.03467
	M 270-1070 ng/dL	M 9.36-37.10 nmol/liter	
Testosterone, Age 20-40	F 0.6-3.1 pg/mL M 15.0-40.0 pg/mL	F 20.8-107.5 pmol/liter M 520-1387 pmol/liter	
Unbound Age 41-60	F 0.4-2.5 pg/mL M 13.0-35.0 pg/mL	F 13.9-86.7 pmol/liter M 451-1213 pmol/liter	x 34.67
Age 61-80	F 0.2-2.0 pg/mL M 12.0-28.0 pg/mL	F 6.9-69.3 pmol/liter M 416-971 pmol/liter	
Triglycerides Normal (fasting) Borderline High Very High	40-150 mg/dL 150-200 mg/dL 200-500 mg/dL >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	
WBC (White blood cells, Leukocytes)	4.5-11.0 x 10^3/mm^3	4.5-11.0 x 10^9/liter	No conversion

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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 (microkatals), nkat (nanokatals) 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

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