CLINICAL LABORATORY TESTS – REFERENCE VALUES

This table lists reference ranges (expressed in both SI units and traditional units) for the most common laboratory tests and is intended for interpretation of the results as they are provided in the examinations. **Most of the values apply to adults and where they differ for children it will be indicated.** Many important laboratory reference values are not listed here, because of the less frequent use of these tests. Such values are inserted parenthetically following the result recorded in the examination question.

Tests	SI Units	Traditional Units
Albumin (serum)	35-50 g/L	3.5-5.0 g/dL
Amylase (serum)	25-125 IU/L	25-125 U/L
Bicarbonate (HCO_3) (serum)	23-29 mmol/L	23-29 mEq/L
Bilirubin (serum)* Neonates (conjugated)	0-10 µmol/L	0-0.6 mg/dL
(total)	1.7-180 µmol/L	1.0-10.5 mg/dL
Adults (conjugated)	0-5 µmol/L	0-0.3 mg/dL
(total)	3-22 µmol/L	0.2-1.3 mg/dL
Bleeding time (Ivy)	< 5 min	< 5 min
Calcium (serum)**		
Total	2.10-2.50 mmol/L	8.4-10.6 mg/dL
Ionized	1.15-1.35 mmol/L	4.6-5.1 mg/dL
Calcium (urine)	< 6.2 mmol/d	< 250 mg/24h
Carcinoembryonic antigen (CEA) (serum)	< 3.0 µg/L	< 3.0 ng/mL
CO_2 (total)**	22-29 mmol/L	22-29 mEq/L
Chloride (serum)	96-106 mmol/L	96-106 mEq/L
Chloride (urine) Infant	2-10 mmol/d	2-10 mEq/24h
Child	14-50 mmol/d	14-50 mEq/24h
Adults	110-250 mmol/d	110-250 mEq/24h
Cholesterol (serum)**	< 5.2 mmol/L	< 200 mg/dL
Cortisol (plasma) 8 AM	170-635 nmol/L	6-23 µg/dL
4 PM	82-413 nmol/L	3-15 µg/dL
Creatinine (serum)	50-110 µmol/L	0.6-1.2 mg/dL
Creatinine (urine) Males	8.8-17.6 mmol/d	1.0-2.0 g/24h
Females	7.0-15.8 mmol/d	0.8-1.8 g/24h
Creatine kinase (CK, CPK) - Males (race dependent)	20-215 IU/L	20-215 U/L
Females (race dependent)	20-160 IU/L	20-160 U/L
Erythrocytes (RBCs) - Children**	4.5-5.1 x 10^{12}/L	4.5-5.1 million/mm^3
Males	4.6-6.2 x 10^{12}/L	4.6-6.2 million/mm^3
Females	4.2-5.4 x 10^{12}/L	4.2-5.4 million/mm^3
Ferritin (serum)	20-200 µg/L	20-200 ng/mL
Follicle-stimulating hormone (FSH) (plasma)		
Males	1-10 IU/L	1-10 mU/mL
Females, premenopausal	20-50 IU/L	20-50 mU/mL
Females, postmenopausal	40-250 IU/L	40-250 mU/mL
Glucose (fasting) (plasma or serum)	3.9-6.1 mmol/L	70-110 mg/dL
Growth hormone (hGH) (serum, adult) fasting	0-10 µg/L	0-10 ng/mL
Hematocrit - Newborn	0.49-0.54	49-54%
Children**	0.35-0.49	35-49%
Males	0.40-0.54	40-54%
Females	0.37-0.47	37-47%
Hemoglobin (Hb) - Newborn	165-195 g/L	16.5-19.5 g/dL
Children**	112-165 g/L	11.2-16.5 g/dL
Males	140-180 g/L	14.0-18.0 g/dL
Females	120-160 g/L	12.0-16.0 g/dL
High density lipoproteins (HDL) (recommended range)	> 0.91 mmol/L	> 35 mg/dL
INR	0.9-1.1	0.9-1.1
Iron (serum) - Males	13-31 µmol/L	75-175 µg/dL
Females	5-29 µmol/L	28-162 µg/dL
Iron binding capacity (serum) (TIBC)	45-73 µmol/L	250-410 µg/dL
Lactate dehydrogenase (LDH) (serum) - Adult	45-90 IU/L	45-90 U/L
Child	60-170 IU/L	60-170 U/L
> 60 years old	55-100 IU/L	55-100 U/L

*Test values are method dependent
**Test values vary with age
***Test values are diet dependent

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Tests	SI Units	Traditional Units
Leukocytes - Total	3.5-12.0 x 10^9/L	3500-12,000/mm^3
Differential: Neutrophils	3000-5800 x 10^6/L	3000-5800/mm^3
Lymphocytes	1500-3000 x 10^6/L	1500-3000/mm^3
Monocytes	300-500 x 10^6/L	300-500/mm^3
Eosinophils	50-250 x 10^6/L	50-250/mm^3
Basophils	15-50 x 10^6/L	15-50/mm^3
Low density lipoproteins (LDL) (recommended range)	< 3.4 mmol/L	< 130 mg/dL
Luteinizing hormone (LH) (serum) – Males	1-9 IU/L	1-9 IU/L
Females (follicular)	2-10 IU/L	2-10 IU/L
(mid-cycle)	15-65 IU/L	15-65 IU/L
(luteal)	1-12 IU/L	1-12 IU/L
(postmenopausal)	12-65 IU/L	12-65 IU/L
Magnesium (serum)	0.65-1.05 mmol/L	1.3-2.1 mg/dL
Magnesium (urine)	3.0-4.3 mmol/d	6.0-8.5 mEq/24h
Mean corpuscular volume (MCV)	76-100 fL	76-100 μm^3
Osmolality (serum)	285-295 mmol/kg	285-295 mOsm/kg
Osmolality (urine)	38-1400 mmol/kg	38-1400 mOsm/kg
Oxygen (arterial saturation)	94-99%	94-99%
Parathyroid hormone (PTH)	10-65 ng/L	10-65 pg/mL
Partial thromboplastin time (PTT)	22-37 sec	22-37 sec
pCO_2 (arterial)	35-45 mm Hg	35-45 mm Hg
pH (arterial)	7.35-7.45	7.35-7.45
Phosphatase, alkaline (serum)	40-160 IU/L	40-160 U/L
Phosphate - Adults	1.0-1.5 mmol/L	3.0-4.5 mg/dL
Children	1.3-2.3 mmol/L	4.0-7.0 mg/dL
Platelet count	150-400 x 10^9/L	150,000-400,000/mm^3
pO_2 (arterial)	80-100 mm Hg	80-100 mm Hg
Potassium (serum) - Newborn	3.7-5.9 mmol/L	3.7-5.9 mEq/L
Infant	4.1-5.3 mmol/L	4.1-5.3 mEq/L
Child	3.4-4.7 mmol/L	3.4-4.7 mEq/L
Adult	3.5-5.1 mmol/L	3.5-5.1 mEq/L
Potassium (urine)***	25-125 mmol/d	25-125 mEq/24h
Progesterone (serum) (adult) - Males	0.0-1.3 nmol/L	0.0-0.4 ng/mL
Females (follicular)	0.3-4.8 nmol/L	0.1-1.5 ng/mL
(luteal)	8.0-89.0 nmol/L	2.5-28.0 ng/mL
Prolactin (serum) - Males	1-20 µg/L	1-20 ng/mL
Females	1-25 µg/L	1-25 ng/mL
Prostate specific antigen (PSA)	0-4.0 µg/L	0-4.0 ng/mL
Protein (serum) - Total	60-80 g/L	6.0-8.0 g/dL
Albumin	35-55 g/L	3.5-5.5 g/dL
Protein (urine)	10-150 mg/d	10-150 mg/24h
Prothrombin time (PT)	9-12 sec.	9-12 sec.
Reticulocytes	25-75 x 10^9/L	25,000-75,000/mm^3
Sedimentation rate (ESR)	0-15 mm/h	0-15 mm/h
Sodium (serum or plasma)	135-145 mmol/L	135-145 mEq/L
Sodium (urine)***	40-220 mmol/d	40-220 mEq/24h
Specific gravity	1.003-1.030	1.003-1.030
Sperm count	20-150 x 10^6/mL	20,000-150,000/mm^3
Testosterone - Males	9.5-30 nmol/L	275-875 ng/dL
Females	0.8-2.6 nmol/L	23-75 ng/dL
Pregnant females	1.3-6.6 nmol/L	38-190 ng/dL
Thrombin time (plasma)	< 17 sec	< 17 sec
Thyroid-stimulating hormone (TSH) (serum) - Adults	0.4-4.8 mIU/L	0.4-4.8 mIU/L
-Term infants: (0-1 day)	1-39 mIU/L	1-39 mIU/L
(1-4 days)	1-17 mIU/L	1-17 mIU/L
(2-20 weeks)	1.7-9.1 mIU/L	1.7-9.1 mIU/L
(21 weeks to 20 years)	0.7-6.4 mIU/L	0.7-6.4 mIU/L
Thyroxine (T_4) (serum)**	66-155 nmol/L	5-12 µg/dL
Thyroxine, free (FT_4) (serum)**	13-27 pmol/L	1.0-2.1 ng/dL
Transaminase (serum) -- AST (SGOT)	7-40 IU/L	7-40 mU/mL
ALT (SGPT)	5-35 IU/L	5-35 mU/mL
Triiodothyronine (T_3) (serum)	1.1-2.9 mmol/L	70-190 ng/dL
Triglycerides	0.45-1.71 mmol/L	40-150 mg/dL
Urea (plasma or serum)	4.0-8.2 mmol/L	24-49 ng/dL
Urea nitrogen (BUN) (plasma or serum)	8.0-16.4 mmol/L	22-46 mg/dL
Uric acid (serum) (enzymatic)	120-420 µmol/L	2.0-7.0 mg/dL

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