



ABIM Laboratory Test Reference Ranges – January 2021

| Laboratory Tests | Reference Ranges |
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| 1,25-Dihydroxyvitamin D (1,25-dihydroxycholecalciferol), serum | See Vitamin D metabolites |
| 17-Hydroxyprogesterone, serum | |
| Female, follicular | <80 ng/dL |
| Female, luteal | <285 ng/dL |
| Female, postmenopausal | <51 ng/dL |
| Male (adult) | <220 ng/dL |
| 25-Hydroxyvitamin D (25-Hydroxycholecalciferol), serum | See Vitamin D metabolites |
| 5-Hydroxyindoleacetic acid, urine | 2–9 mg/24 hr |
| 6-Thioguanine, whole blood | 230–400 pmol/8x10 ⁸ RBCs |
| Absolute neutrophil count (ANC) | 2000–8250/μL |
| Acid phosphatase, serum | |
| Total | 0.5–2.0 (Bodansky) units/mL |
| Prostatic fraction | 0.1–0.4 unit/mL |
| ACTH, plasma | 10–60 pg/mL |
| Activated partial thromboplastin time | 25–35 seconds |
| ADAMTS13 activity | >60% |
| Adrenocorticotrophic hormone (ACTH), plasma | 10–60 pg/mL |
| Albumin, serum | 3.5–5.5 g/dL |
| Albumin, urine | <25 mg/24 hr |
| Albumin-to-creatinine ratio, urine | <30 mg/g |
| Aldolase, serum | 0.8–3.0 IU/mL |
| Aldosterone, plasma | |
| Supine or seated | ≤10 ng/dL |
| Standing | <21 ng/dL |
| Low-sodium diet (supine) | ≤30 ng/dL |
| Aldosterone, urine | 5–19 μg/24 hr |
| Alkaline phosphatase, serum | 30–120 U/L |
| Alkaline phosphatase, bone specific | 5.6–18.0 μg/L for premenopausal women |
| Alpha ₁ -antitrypsin (AAT), serum | 150–350 mg/dL |
| Alpha ₂ -antiplasmin activity, plasma | 75%–115% |
| Alpha-amino nitrogen, urine | 100–290 mg/24 hr |
| Alpha-fetoprotein, serum | <10 ng/mL |
| Amino acids, urine | 200–400 mg/24 hr |
| Aminotransferase, serum alanine (ALT, SGPT) | 10–40 U/L |
| Aminotransferase, serum aspartate (AST, SGOT) | 10–40 U/L |
| Ammonia, blood | 40–70 μg/dL |
| Amylase, serum | 25–125 U/L (80–180 [Somogyi] units/dL) |
| Amylase, urine | 1–17 U/hr |
| Androstenedione, serum | Female: 30–200 ng/dL; male: 40–150 ng/dL |
| Angiotensin-converting enzyme, serum | 8–53 U/L |
| Anion gap, serum | 7–13 mEq/L |
| Antibodies to double-stranded DNA | 0–7 IU/mL |

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| Anticardiolipin antibodies | |
| IgG | <20 GPL |
| IgM | <20 MPL |
| Anti-cyclic citrullinated peptide, antibodies to | <20 units |
| Antideoxyribonuclease B | <280 units |
| Anti-F-actin antibodies, serum | ≤1:80 |
| Antihistone antibodies | <1:16 |
| Anti-liver-kidney microsomal antibodies (anti-LKM) | <1:20 |
| Antimitochondrial antibodies | ≤1:5 |
| Anti–myelin associated glycoprotein antibody | <1:1600 |
| Antimyeloperoxidase antibodies | <1.0 U |
| Antinuclear antibodies | ≤1:40 |
| Anti–smooth muscle antibodies | ≤1:80 |
| Antistreptolysin O titer | <200 Todd units |
| Antithrombin activity | 80%–120% |
| Antithyroglobulin antibodies | <20 U/mL |
| Antithyroid peroxidase antibodies | <2.0 U/mL |
| Anti-tissue transglutaminase antibodies | See Tissue transglutaminase antibody |
| Arterial blood gas studies (patient breathing room air): | |
| pH | 7.38–7.44 |
| PaCO ₂ | 38–42 mm Hg |
| PaO ₂ | 75–100 mm Hg |
| Bicarbonate | 23–26 mEq/L |
| Oxygen saturation | ≥95% |
| Methemoglobin | 0.5%–3.0% |
| Ascorbic acid (vitamin C), blood | 0.4–1.5 mg/dL |
| Ascorbic acid, leukocyte | 16.5 ± 5.1 mg/dL of leukocytes |
| (1,3)-Beta-D-glucan, serum | <60 pg/mL |
| Beta-human chorionic gonadotropin (beta-hCG), serum | Female, premenopausal nonpregnant: <1.0 U/L ; female, postmenopausal: <7.0 U/L; male: <1.4 U/L |
| Beta-human chorionic gonadotropin (beta-hCG), urine | <2 mIU/24 hr |
| Beta ₂ -glycoprotein I antibodies: | |
| IgG | <21 SGU |
| IgM | <21 SMU |
| Beta-hydroxybutyrate, serum | <0.4 mmol/L |
| Beta ₂ -microglobulin, serum | 0.54–2.75 mg/L |
| Bicarbonate, serum | 23–28 mEq/L |
| Bilirubin, serum | |
| Total | 0.3–1.0 mg/dL |
| Direct | 0.1–0.3 mg/dL |
| Indirect | 0.2–0.7 mg/dL |
| Bleeding time (template) | <8 minutes |
| Blood urea nitrogen (BUN), serum or plasma | 8–20 mg/dL |
| B-type natriuretic peptide, plasma | <100 pg/mL |
| C peptide, serum | 0.8–3.1 ng/mL |
| Calcitonin, serum | Female: ≤5 pg/mL; male: ≤10 pg/mL |
| Calcium, ionized, serum | 1.12–1.23 mmol/L |
| Calcium, serum | 8.6–10.2 mg/dL |

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| Calcium, urine | Female: <250 mg/24 hr; male: <300 mg/24 hr |
| Carbohydrate antigens, serum | |
| CA 19-9 | 0–37 U/mL |
| CA 27-29 | <38.0 U/mL |
| CA 125 | <35 U/mL |
| Carbon dioxide content, serum | 23–30 mEq/L |
| Carboxyhemoglobin, blood | <5% |
| Carcinoembryonic antigen, plasma | <2.5 ng/mL |
| Carotene, serum | 75–300 µg/dL |
| Catecholamines, plasma | |
| Dopamine | <30 pg/mL |
| Epinephrine | |
| Supine | <50 pg/mL |
| Standing | <95 pg/mL |
| Norepinephrine | |
| Supine | 112–658 pg/mL |
| Standing | 217–1109 pg/mL |
| Catecholamines, urine | |
| Dopamine | 65–400 µg/24 hr |
| Epinephrine | 2–24 µg/24 hr |
| Norepinephrine | 15–100 µg/24 hr |
| Total | 26–121 µg/24 hr |
| CD4 T-lymphocyte count | 530–1570/µL |
| Cell count, CSF: | |
| Leukocytes (WBCs) | 0–5 cells/µL |
| Erythrocytes (RBCs) | 0/µL |
| Ceruloplasmin, serum (plasma) | 25–43 mg/dL |
| Chloride, CSF | 120–130 mEq/L |
| Chloride, serum | 98–106 mEq/L |
| Chloride, urine | |
| Spot | mEq/L; varies |
| 24-hour measurement | mEq/24 hr; varies with intake |
| Cholesterol, serum | |
| Total | |
| Desirable | <200 mg/dL |
| Borderline-high | 200–239 mg/dL |
| High | >239 mg/dL |
| High-density lipoprotein | |
| Low | Female: <50 mg/dL; male: <40 mg/dL |
| Low-density lipoprotein | |
| Optimal | <100 mg/dL |
| Near-optimal | 100–129 mg/dL |
| Borderline-high | 130–159 mg/dL |
| High | 160–189 mg/dL |
| Very high | >189 mg/dL |
| Cholinesterase, serum (pseudocholinesterase) | ≥0.5 pH units/hr |
| Packed cells | ≥0.7 pH units/hr |
| Chorionic gonadotropin, beta-human (beta-hCG), serum | See Beta-human chorionic gonadotropin (beta-hCG), serum |

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| Chorionic gonadotropin, beta-human (beta-hCG), urine | See Beta-human chorionic gonadotropin (beta-hCG), urine |
| Chromogranin A, serum | <93 ng/mL |
| Citrate, urine | 250–1000 mg/24 hr |
| Clotting time (Lee-White) | 5–15 minutes |
| Coagulation factors, plasma | |
| Factor I (fibrinogen) | 200–400 mg/dL |
| Factor II (prothrombin) | 60%–130% |
| Factor V (accelerator globulin) | 60%–130% |
| Factor VII (proconvertin) | 60%–130% |
| Factor VIII (antihemophilic globulin) | 50%–150% |
| Factor IX (plasma thromboplastin component) | 60%–130% |
| Factor X (Stuart factor) | 60%–130% |
| Factor XI (plasma thromboplastin antecedent) | 60%–130% |
| Factor XII (Hageman factor) | 60%–130% |
| Factor XIII | 57%–192% |
| Cold agglutinin titer | >1:64 positive |
| Complement components, serum | |
| C3 | 100–233 mg/dL |
| C4 | 14–48 mg/dL |
| CH50 | 110–190 units/mL |
| Copper, serum | 100–200 µg/dL |
| Copper, urine | 0–100 µg/24 hr |
| Coproporphyrin, urine | 50–250 µg/24 hr |
| Cortisol, free, urine | 4–50 µg/24 hr |
| Cortisol, plasma | |
| 8 AM | 5–25 µg/dL |
| 4 PM | <10 µg/dL |
| 1 hour after cosyntropin | ≥18 µg/dL |
| Overnight suppression test (1-mg) | <1.8 µg/dL |
| Overnight suppression test (8-mg) | >50% reduction in cortisol |
| Cortisol, saliva, 11 PM – midnight | <0.09 µg/dL |
| C-reactive protein, serum | ≤0.8 mg/dL |
| C-reactive protein (high sensitivity), serum | Low risk = <1.0 mg/L; Average risk = 1.0–3.0 mg/L; High risk = >3.0 mg/L |
| Creatine kinase, serum | |
| Total | Female: 30–135 U/L; male: 55–170 U/L |
| MB isoenzymes | <5% of total |
| Creatine, urine | Female: 0–100 mg/24 hr; male: 0–40 mg/24 hr |
| Creatinine clearance, urine | 90–140 mL/min/1.73 m ² |
| Creatinine, serum | Female: 0.50–1.10 mg/dL; male: 0.70–1.30 mg/dL |
| Creatinine, urine | |
| Spot | mg/dL; varies |
| 24-hour measurement | 15–25 mg/kg body weight/24 hr |
| Cyclosporine, whole blood (trough) | |
| Therapeutic | 100–200 ng/mL |
| 0–3 months post transplantation | 150–250 ng/mL |
| More than 3 months post transplantation | 75–125 ng/mL |
| D-dimer, plasma | <0.5 µg/mL |
| Dehydroepiandrosterone sulfate (DHEA-S), serum | Female: 44–332 µg/dL; male: 89–457 µg/dL |

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| Delta-aminolevulinic acid, serum | <20 µg/dL |
| Digoxin, serum | Therapeutic: 1.0–2.0 ng/mL (<1.2 ng/mL for patients with heart failure) |
| Dihydrotestosterone, serum | Adult male: 25–80 ng/dL |
| Dopamine, plasma | <30 pg/mL |
| Dopamine, urine | 65–400 µg/24 hr |
| D-Xylose absorption (after ingestion of 25 g of D-xylose) | |
| Serum | 25–40 mg/dL |
| Urinary excretion | 4.5–7.5 g during a 5-hr period |
| Electrolytes, serum | |
| Sodium | 136–145 mEq/L |
| Potassium | 3.5–5.0 mEq/L |
| Chloride | 98–106 mEq/L |
| Bicarbonate | 23–28 mEq/L |
| Epinephrine, plasma | |
| Supine | <110 pg/mL |
| Standing | <140 pg/mL |
| Epinephrine, urine | <20 µg/24 hr |
| Erythrocyte count | 4.2–5.9 million/µL |
| Erythrocyte sedimentation rate (Westergren) | Female: 0–20 mm/hr; male: 0–15 mm/hr |
| Erythrocyte survival rate (⁵¹ Cr) | T½ = 28 days |
| Erythropoietin, serum | 4–26 mU/mL |
| Estradiol, serum | |
| Female, follicular | 10–180 pg/mL |
| Mid-cycle peak | 100–300 pg/mL |
| Luteal | 40–200 pg/mL |
| Postmenopausal | <10 pg/mL |
| Male | 20–50 pg/mL |
| Estriol, urine | >12 mg/24 hr |
| Estrogen receptor protein | Negative: <10 fmol/mg protein |
| Estrone, serum | 10–60 pg/mL |
| Ethanol, blood | <0.005% (<5 mg/dL) |
| Coma level | >0.5% (>500 mg/dL) |
| Intoxication | ≥0.08%–0.1% (≥80–100 mg/dL) |
| Euglobulin clot lysis time | 2–4 hours at 37.0 C |
| Everolimus, whole blood (trough) | Therapeutic: 3.0–8.0 ng/mL |
| Factor XIII, B subunit, plasma | 60–130 U/dL |
| Fecal fat | <7 g/24 hr |
| Fecal nitrogen | <2 g/24 hr |
| Fecal pH | 7.0–7.5 |
| Fecal potassium | <10 mEq/L |
| Fecal sodium | <10 mEq/L |
| Fecal urobilinogen | 40–280 mg/24 hr |
| Fecal weight | <250 g/24 hr |
| Ferritin, serum | Female: 24–307 ng/mL; male: 24–336 ng/mL |
| Fibrin(ogen) degradation products | <10 µg/mL |
| Fibrinogen, plasma | 200–400 mg/dL |
| Fibroblast growth factor-23, serum | 30–80 RU/mL |
| Flecainide, serum | Therapeutic: 0.2–1.0 µg/mL |

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| Folate, red cell | 150–450 ng/mL of packed cells |
| Folate, serum | 1.8–9.0 ng/mL |
| Follicle-stimulating hormone, serum | |
| Female, follicular/luteal | 2–9 mIU/mL (2–9 U/L) |
| Female, mid-cycle peak | 4–22 mIU/mL (4–22 U/L) |
| Female, postmenopausal | >30 mIU/mL (>30 U/L) |
| Male (adult) | 1–7 mIU/mL (1–7 U/L) |
| Children, Tanner stages 1, 2 | 0.5–8.0 mIU/mL (0.5–8.0 U/L) |
| Children, Tanner stages 3, 4, 5 | 1–12 mIU/mL (1–12 U/L) |
| Free kappa light chain, serum | 3.3–19.4 mg/L |
| Free kappa-to-free lambda light chain ratio, serum | 0.26–1.65 |
| Free lambda light chain, serum | 5.7–26.3 mg/L |
| Gamma globulin, CSF | 6.1–8.3 mg/dL |
| Gamma-glutamyltransferase | |
| (gamma-glutamyl transpeptidase), serum | Female: 8–40 U/L; male: 9–50 U/L |
| Gastric secretion | |
| Basal acid analysis | 10–30 units of free acid |
| Basal acid output | Female: 2.0 ± 1.8 mEq of HCl/hr; male: 3.0 ± 2.0 mEq of HCl/hr |
| Maximal output after pentagastrin stimulation | 23 ± 5 mEq of HCl/hr |
| Gastrin, serum | <100 pg/mL |
| Gentamicin, serum | Therapeutic: peak 5.0–10.0 µg/mL; trough: <2.0 µg/mL |
| Glucose, CSF | 50–75 mg/dL |
| Glucose, plasma (fasting) | 70–99 mg/dL |
| Glucose-6-phosphate dehydrogenase, blood | 5–15 units/g of hemoglobin |
| Glycoprotein α-subunit, serum | <1 ng/mL |
| Growth hormone, serum | |
| At rest | <5 ng/mL |
| Response to provocative stimuli | >7 ng/mL |
| Haptoglobin, serum | 83–267 mg/dL |
| Hematocrit, blood | Female: 37%–47%; male: 42%–50% |
| Hemoglobin A _{1c} | 4.0%–5.6% |
| Hemoglobin, blood | Female: 12–16 g/dL; male: 14–18 g/dL |
| Hemoglobin fractionation | |
| Hb A | 96%–98% |
| Hb A ₂ | 1.5%–3.5% |
| Hb F | <1% |
| Hemoglobin, plasma | <5.0 mg/dL |
| Heparin–anti-factor Xa assay, plasma | 0.3–0.7 IU/mL [therapeutic range for standard (unfractionated) heparin therapy] |
| Heparin–platelet factor 4 antibody, serum | Positive: >0.4 optical density units |
| Hepatic copper | 25–40 µg/g dry weight |
| Hepatic iron index | <1.0 |
| Histamine excretion, urine | 20–50 µg/24 hr |
| Homocysteine, plasma | 5–15 µmol/L |
| β-Human chorionic gonadotropin (β-hCG), serum | Female, premenopausal nonpregnant: <1.0 U/L; female, postmenopausal: <7.0 U/L; male: <1.4 U/L |
| β-Human chorionic gonadotropin (β-hCG), urine | <2 mIU/24 hr |
| Hydroxyproline, urine | 10–30 mg/sq meter of body surface/24 hr |
| Immature platelet fraction | 1%–5% of platelet count |

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| Immune complexes, serum | 0–50 µg/dL |
| Immunoglobulins, serum | |
| IgA | 90–325 mg/dL |
| IgE | <380 IU/mL |
| IgG | 800–1500 mg/dL |
| IgM | 45–150 mg/dL |
| Immunoglobulin free light chains, serum | |
| Kappa | 3.3–19.4 mg/L |
| Lambda | 5.7–26.3 mg/L |
| Kappa-to-lambda ratio | 0.26–1.65 |
| Insulin, serum (fasting) | <20 µU/mL |
| Insulin-like growth factor 1 (IGF-1) (somatomedin-C), serum | |
| Ages 16–24 | 182–780 ng/mL |
| Ages 25–39 | 114–492 ng/mL |
| Ages 40–54 | 90–360 ng/mL |
| Ages 55 and older | 71–290 ng/mL |
| Iodine, urine | |
| Spot | µg/L; varies |
| Iron, serum | 50–150 µg/dL |
| Iron-binding capacity, serum (total) | 250–310 µg/dL |
| Lactate dehydrogenase, serum | 80–225 U/L |
| Lactate, arterial blood | <1.3 mmol/L (<1.3 mEq/L) |
| Lactate, serum or plasma | 0.7–2.1 mmol/L |
| Lactate, venous blood | 0.7–1.8 mEq/L; 6–16 mg/dL |
| Lactic acid, serum | 6–19 mg/dL (0.7–2.1 mmol/L) |
| Lactose tolerance test, GI | Increase in plasma glucose: >15 mg/dL |
| Lead, blood | <5.0 µg/dL |
| Leukocyte count | 4000–11,000/µL |
| Segmented neutrophils | 50%–70% |
| Band forms | 0%–5% |
| Lymphocytes | 30%–45% |
| Monocytes | 0%–6% |
| Basophils | 0%–1% |
| Eosinophils | 0%–3% |
| Lipase, serum | 10–140 U/L |
| Lipoprotein(a), serum | Desirable: <30 mg/dL |
| Lithium, plasma | |
| Therapeutic | 0.6–1.2 mEq/L |
| Toxic level | >2 mEq/L |
| Luteinizing hormone (LH), serum | |
| Female, follicular/luteal | 1–12 mIU/mL (1–12 U/L) |
| Female, mid-cycle peak | 9–80 mIU/mL (9–80 U/L) |
| Female, postmenopausal | >30 mIU/mL (>30 U/L) |
| Male (adult) | 2–9 mIU/mL (2–9 U/L) |
| Children, Tanner stages 1, 2, 3 | <9.0 mIU/mL (<9.0 U/L) |
| Children, Tanner stages 4, 5 | 1–15 mIU/mL (1–15 U/L) |

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| Lymphocyte subsets | |
| CD3 | 900–3245/ μ L |
| CD4 | 530–1570/ μ L |
| CD8 | 430–1060/ μ L |
| CD19 | 208–590/ μ L |
| CD56 | 40–500/ μ L |
| Magnesium, serum | 1.6–2.6 mEq/L |
| Magnesium, urine | 14–290 mg/24 hr |
| Mean corpuscular hemoglobin | 28–32 pg |
| Mean corpuscular hemoglobin concentration | 33–36 g/dL |
| Mean corpuscular volume | 80–98 fL |
| Mean platelet volume | 7–9 fL |
| Metanephrines, fractionated, plasma | |
| Metanephrine | <0.5 nmol/L |
| Normetanephrine | <0.9 nmol/L |
| Metanephrines, fractionated, 24-hour urine | |
| Metanephrine | <400 μ g/24 hr |
| Normetanephrine | <900 μ g/24 hr |
| Myoglobin, serum | <100 μ g/L |
| Norepinephrine, plasma | |
| Supine | 70–750 pg/mL |
| Standing | 200–1700 pg/mL |
| Norepinephrine, urine | 0–100 μ g/24 hr |
| Normetanephrine, fractionated, plasma | <0.9 nmol/L |
| Normetanephrine, fractionated, 24-hour urine | <900 μ g/24 hr |
| N-telopeptide, urine | Female: 11–48 nmol BCE/mmol creatinine; male: 7–68 nmol BCE/mmol creatinine |
| N-terminal-pro-B-type natriuretic peptide (NT-pro-BNP), serum or plasma | If eGFR >60 mL/min/1.73 m ² 18–49 years of age Heart failure unlikely: \leq 300 pg/mL High probability of heart failure: \geq 450 pg/mL 50–75 years of age Heart failure unlikely: \leq 300 pg/mL High probability of heart failure: \geq 900 pg/mL Older than 75 years of age Heart failure unlikely: \leq 300 pg/mL High probability of heart failure: \geq 1800 pg/mL If eGFR <60 mL/min/1.73 m ² 18 years of age or older High probability of heart failure: \geq 1200 pg/mL |
| Osmolality, serum | 275–295 mOsm/kg H ₂ O |
| Osmolality, urine | 38–1400 mOsm/kg H ₂ O |
| Osmotic fragility of erythrocytes | Increased if hemolysis occurs in over 0.5% NaCl; decreased if hemolysis is incomplete in 0.3% NaCl |
| Osteocalcin, serum | Female: 7.2–27.9 ng/mL; male: 11.3–35.4 ng/mL |
| Oxalate, urine | <40 mg/24 hr |
| Oxygen consumption | 225–275 mL/min |
| Oxygen saturation, arterial blood | \geq 95% |
| Parathyroid hormone, serum | |
| C-terminal | 150–350 pg/mL |
| Intact | 10–65 pg/mL |
| Intact (dialysis patients only) | Target: 130–585 pg/mL |

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| Parathyroid hormone-related protein, serum | <1.5 pmol/L |
| Partial thromboplastin time (activated) | 25–35 seconds |
| pH, urine | 4.5–8.0 |
| Phenolsulfonphthalein, urine | At least 25% excreted by 15 minutes; 40% by 30 minutes; 60% by 120 minutes |
| Phenytoin, serum | Therapeutic: 10–20 µg/mL |
| Phosphatase (acid), serum | |
| Total | 0.5–2.0 (Bodansky) units/mL |
| Prostatic fraction | 0.1–0.4 unit/mL |
| Phosphatase (alkaline), serum | 30–120 U/L |
| Phospholipids, serum (total) | 200–300 mg/dL |
| Phosphorus, serum | 3.0–4.5 mg/dL |
| Phosphorus, urine | 500–1200 mg/24 hr |
| Platelet count | 150,000–450,000/µL |
| Platelet function analysis (PFA-100): | |
| Collagen–epinephrine closure time | 60–143 seconds |
| Collagen–ADP closure time | 58–123 seconds |
| Platelet survival rate (⁵¹ Cr) | 10 days |
| Potassium, serum | 3.5–5.0 mEq/L |
| Potassium, urine | |
| Spot | mEq/L; varies |
| 24-hour measurement | mEq/24 hr; varies with intake |
| Prealbumin, serum | 16–30 mg/dL |
| Pregnanetriol, urine | 0.2–3.5 mg/24 hr |
| Pressure (opening) [initial], CSF | 70–180 mm CSF (70–180 mm H ₂ O) |
| Procalcitonin, serum | ≤0.10 ng/mL |
| Progesterone, serum | |
| Female, follicular | 0.02–0.9 ng/mL |
| Female, luteal | 2–30 ng/mL |
| Male (adult) | 0.12–0.3 ng/mL |
| Proinsulin, serum | 3–20 pmol/L |
| Prolactin, serum | <20 ng/mL |
| Prostate-specific antigen, serum | ng/mL; no specific normal or abnormal level |
| Protein C activity, plasma | 65%–150% |
| Protein C antigen, plasma | 70%–140% |
| Protein catabolic rate, urine | goal: 1.0–1.2 g/kg/24 hr |
| Protein S activity, plasma | 57%–131% |
| Protein S antigen, plasma | |
| Total | 60%–140% |
| Free | 60%–130% |
| Protein, urine | |
| Spot | mg/dL; varies |
| 24-hour measurement | <100 mg/24 hr |
| Proteins, CSF total | 15–45 mg/dL |
| Proteins, serum | |
| Total | 5.5–9.0 g/dL |
| Albumin | 3.5–5.5 g/dL |

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| Proteins, serum (continued) | |
| Globulin | 2.0–3.5 g/dL |
| Alpha1 | 0.2–0.4 g/dL |
| Alpha2 | 0.5–0.9 g/dL |
| Beta | 0.6–1.1 g/dL |
| Gamma | 0.7–1.7 g/dL |
| Protein-to-creatinine ratio, urine | <0.2 mg/mg |
| Prothrombin time, plasma | 11–13 seconds |
| Pyruvic acid, blood | 0.08–0.16 mmol/L |
| Quinidine, serum | Therapeutic: 2–5 µg/mL |
| Red cell distribution width (RDW) | 9.0–14.5 |
| Red cell mass | Female: 22.7–27.9 mL/kg; male: 24.9–32.5 mL/kg |
| Renin activity (angiotensin-I radioimmunoassay) | |
| Peripheral plasma | |
| Normal diet | |
| Supine | 0.3–2.5 ng/mL/hr |
| Upright | 0.2–3.6 ng/mL/hr |
| Low sodium diet | |
| Supine | 0.9–4.5 ng/mL/hr |
| Upright | 4.1–9.1 ng/mL/hr |
| Diuretics + low sodium diet | 6.3–13.7 ng/mL/hr |
| Renal vein concentration | Normal ratio (high:low): <1.5 |
| Reptilase time | 10–12 seconds |
| Reticulocyte count | 0.5%–1.5% of red cells |
| Reticulocyte count, absolute | 25,000–100,000/µL |
| Rheumatoid factor (nephelometry) | <24 IU/mL |
| Rheumatoid factor, latex test for | ≤1:80 |
| Ristocetin cofactor activity of plasma | 50%–150% |
| Russell viper venom time, dilute | 33–44 seconds |
| Salicylate, plasma | Therapeutic: 20–30 mg/dL |
| Sex hormone-binding globulin | Female, nonpregnant: 18–144 nmol/L; male: 10–57 nmol/L |
| Sodium, serum | 136–145 mEq/L |
| Sodium, urine | |
| Spot | mEq/L; varies |
| 24-hour measurement | mEq/24 hr; varies with intake |
| Specific gravity, urine | 1.002–1.030 |
| Sperm density | 10–150 million/mL |
| Sweat test for sodium and chloride | <60 mEq/L |
| T3 resin uptake | 25%–35% |
| T-lymphocyte count, CD4 | 530–1570/µL |
| Tacrolimus, whole blood (trough) | Therapeutic: 5–15 ng/mL {For transplant patients: 10.0–15.0 ng/mL (0–3 months post transplantation); 5.0–10.0 ng/mL (more than 3 months post transplantation)} |
| Testosterone, serum | Female: 18–54 ng/dL; male: 291–1100 ng/dL |
| Testosterone, bioavailable, serum | Female, age 18–69 yrs: 0.5–8.5 ng/dL |
| Testosterone, free, serum | Male: 70–300 pg/mL |
| Theophylline, serum | Therapeutic: 8–20 µg/mL |
| Thrombin time | 17–23 seconds |

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| Thyroid function studies | |
| T3 resin uptake | 25%–35% |
| Thyroglobulin, serum | <20 ng/mL |
| Thyroidal iodine (¹²³ I) uptake | 5%–30% of administered dose at 24 hours |
| Thyroid-stimulating hormone (TSH), serum | 0.5–4.0 μU/mL (0.5–4.0 mU/L) |
| Thyroid-stimulating immunoglobulin (TSI) | <130% |
| Thyroxine-binding globulin, serum | 12–27 μg/mL |
| Thyroxine index, free (estimate) | 5–12 |
| Thyroxine (T ₄), serum | |
| Total | 5–12 μg/dL |
| Free | 0.8–1.8 ng/dL |
| Triiodothyronine (T ₃), serum | |
| Total | 80–180 ng/dL |
| Reverse | 20–40 ng/dL |
| Free | 2.3–4.2 pg/mL |
| Tissue transglutaminase antibody, IgA [by chemiluminescence method] | <20 AU |
| Tissue transglutaminase antibody, IgG [by chemiluminescence method] | <20 AU |
| Tissue transglutaminase antibody, IgA [by ELISA] | <4.0 U/mL |
| Tissue transglutaminase antibody, IgG [by ELISA] | <6.0 U/mL |
| Total proteins, CSF | 15–45 mg/dL |
| Transaminase, serum glutamic oxaloacetic (SGOT) | See Aminotransferase, serum aspartate (AST) |
| Transaminase, serum glutamic pyruvic (SGPT) | See Aminotransferase, serum alanine (ALT) |
| Transferrin saturation | 20%–50% |
| Transferrin, serum | 200–400 mg/dL |
| Triglycerides, serum (fasting) | |
| Optimal | <100 mg/dL |
| Normal | <150 mg/dL |
| Borderline-high | 150–199 mg/dL |
| High | 200–499 mg/dL |
| Very high | >499 mg/dL |
| Troponin I, cardiac, serum | ≤0.04 ng/mL |
| Troponin T, cardiac, serum | ≤0.01 ng/mL |
| Tryptase, serum | <11.5 ng/mL |
| Urea clearance, urine | |
| Standard | 40–60 mL/min |
| Maximal | 60–100 mL/min |
| Urea nitrogen, blood | 8–20 mg/dL |
| Urea nitrogen, urine | 12–20 g/24 hr |
| Uric acid, serum | 3.0–7.0 mg/dL |
| Uric acid, urine | 250–750 mg/24 hr |
| Uroporphyrin, urine | 10–30 μg/24 hr |
| Vanillylmandelic acid, urine | <9 mg/24 hr |
| Venous oxygen content, mixed | 14–16 mL/dL |

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| Venous studies, mixed, blood | |
| pH | 7.32–7.41 |
| PCO ₂ | 42–53 mm Hg |
| PO ₂ | 35–42 mm Hg |
| Bicarbonate | 24–28 mEq/L |
| Oxygen saturation (SvO ₂) | 65%–75% |
| Viscosity, serum | 1.4–1.8 cp |
| Vitamin A, serum: | |
| Adult | 32.5–78.0 µg/dL |
| Pediatric, age 1–2 yr (retinol) | 20–43 µg/dL |
| Vitamin B ₁₂ , serum | 200–800 pg/mL |
| Vitamin D metabolites, serum | |
| 1,25-Dihydroxyvitamin D (1,25-dihydroxycholecalciferol) | 15–60 pg/mL |
| 25-Hydroxyvitamin D (25-hydroxycholecalciferol) | 30–60 ng/mL |
| Vitamin E, serum: | |
| Adult | 5.5–17.0 mg/L |
| Pediatric, age 1–2 yr (alpha-tocopherol) | 2.9–16.6 mg/L |
| Volume, blood | |
| Plasma | Female: 43 mL/kg body weight; male: 44 mL/kg body weight |
| Red cell | Female: 20–30 mL/kg body weight; male: 25–35 mL/kg body weight |
| von Willebrand factor antigen, plasma | 50%–150% |
| Zinc, serum | 75–140 µg/dL |

Revised - January 2021