

Laboratory values

Acetylcholinesterase (ACE), RBC

Blood

26.7–49.2 U/g Hb

—

Acid phosphatase

Serum

0.5–5.5 U/L

0–0.9 mckat/L

Activated partial thromboplastin time (aPTT)

Plasma

25–36 sec

—

Adrenocorticotrophic hormone (ACTH)

Serum

9–52 pg/mL (morning draw)

2–11 pmol/L (morning draw)

Albumin

Serum

3.5–5.4 g/dL

35–54 g/L

Aldosterone

Standing Serum

7–20 ng/dL

194–554 pmol/L

Supine Serum

2–5 ng/dL

55-138 pmol/L

Alkaline phosphatase (ALP)

Serum

36-150 U/L

0.5-2.5 mckat/L

Alpha-1 antitrypsin (AAT)

Serum

83-199 mg/dL

15.3-36.6 mcmol/L

Alpha fetoprotein (AFP)

Serum

0-20 ng/dL

0-20 pg/L

δ-Aminolevulinic acid (ALA)

Serum

15-23 mcg/L

1.14-1.75 mcmol/L

Aminotransferase, alanine (ALT)

Serum

0-35 U/L

0-0.58 pkat/L

Aminotransferase, aspartate (AST)

Serum

0-35 U/L

0-0.58 pkat/L

Ammonia

Plasma

40-80 mcg/dL

23-47 mcmol/L

Amylase

Serum

0-130 U/L

0-2.17 mckat/L

Antibodies to extractable nuclear antigen (AENA)

Serum

< 20.0="">

—

Anti-cyclic citrullinated peptide (anti-CCP) antibodies

Serum

≤ 5.0 units

—

Antidiuretic hormone (ADH; arginine vasopressin)

Plasma

< 1.7="">

< 1.57="">

Anti-double-stranded DNA (dsDNA) antibodies, IgG

Serum

< 25="">

—

Antimitochondrial M2 antibodies

Serum

< 0.1="">

—

Antineutrophil cytoplasmic antibodies (cANCA)

Serum

Negative

—

Antinuclear antibodies (ANA)

Serum

≤ 1.0 units

—

Anti-smooth muscle antibodies (ASMA) titer

Serum

≤ 1:80

—

Antistreptolysin O titer

Serum

< 150=“”>

—

Antithyroid microsomal antibody titer

Serum

<>

—

α1-Antitrypsin (AAT)

Serum

83-199 mg/dL

15.3-36.6 mcmol/L

Apolipoproteins:

A-I, females Serum

98-210 mg/dL

0.98-2.1 g/L

A-I, males Serum

88-180 mg/dL

0.88-1.8 g/L

B-100, females Serum

44-148 mg/dL

0.44-1.48 g/L

B-100, males Serum

55-151 mg/dL

0.55-1.51 g/L

Bicarbonate

Serum

23-28 mEq/L

23-28 mmol/L

Bilirubin:

Direct Serum

0-0.3 mg/dL

0-5.1 mcmol/L

Total Serum

0.3-1.2 mg/dL

5.1-20.5 mcmol/L

Blood volumes (radioisotope labeling):

Plasma, females* Blood

28-43 mL/kg body wt

0.028-0.043 L/kg body wt

Plasma, males* Blood

25-44 mL/kg body wt

0.025-0.044 L/kg body wt

RBCs, females* Blood

20-30 mL/kg body wt

0.02-0.03 L/kg body wt

RBCs, males* Blood

25–35 mL/kg body wt

0.025–0.035 L/kg body wt

Brain (B-type) natriuretic peptide (BNP)

Plasma

< 100="">

—

Calcitonin, age ≥ 16 yr:

Females Serum

< 8="">

—

Males Serum

< 16="">

—

Calcium

Serum

9–10.5 mg/dL

2.2–2.6 mmol/L

Cancer antigen (CA):

CA 125 Serum

< 35="">

—

CA 15-3 Serum

< 30="">

—

Carbon dioxide (CO₂) content

Serum

23–28 mEq/L

23–28 mmol/L

Carbon dioxide partial pressure (PCO₂)

Blood

35–45 mm Hg

—

Carboxyhemoglobin

Plasma

0.5–5%

—

Carcinoembryonic antigen (CEA)

Serum

< 2="">

< 2="">

Carotene

Serum

75–300 mcg/L

1.4–5.6 mcmol/L

CD4:CD8 ratio

Blood

1–4

—

CD4+ T-cell count

Blood

640–1175/mcL

0.64–1.18 x 10⁹/L

CD8+ T-cell count

Blood

335–875/mcL

0.34–0.88 x 10⁹/L

Ceruloplasmin

Serum

25–43 mg/dL

250–430 mg/L

Chloride

Serum

98–106 mEq/L

98–106 mmol/L

Cholesterol, desirable level:

High-density lipoprotein (HDL-C) Plasma

≥ 40 mg/dL

≥ 1.04 mmol/L

Low-density lipoprotein (LDL-C) Plasma

≤ 130 mg/dL

≤ 3.36 mmol/L

Total (TC)

Plasma

150–199 mg/dL

3.88–5.15 mmol/L

Coagulation factors:

Factor I Plasma

150–300 mg/dL

1.5–3.5 g/L

Factor II Plasma

60–150% of normal

—

Factor IX Plasma

60–150% of normal

—
Factor V Plasma

60–150% of normal

—
Factor VII Plasma

60–150% of normal

—
Factor VIII Plasma

60–150% of normal

—
Factor X Plasma

60–150% of normal

—
Factor XI Plasma

60–150% of normal

—
Factor XII Plasma

60–150% of normal

—
Complement:

C3 Serum

55–120 mg/dL

0.55–1.20 g/L

C4 Serum

20–59 mg/dL

0.20–0.59 g/L

Total

Serum

37-55 U/mL

37-55 kU/L

Copper

Serum

70-155 mcg/L

11-24.3 mcmol/L

Cortisol:

1 h after cosyntropin Serum

18 mcg/dL and usually ≥ 8 mcg/dL above baseline

498 nmol/L and usually ≥ 221 nmol/L above baseline

At 5 pm Serum

3-13 mcg/dL

83-359 nmol/L

At 8 am Serum

8-20 mcg/dL

251-552 nmol/L

After overnight suppression test Serum

$< 5 = \text{""}$

$< 138 = \text{""}$

C-peptide

Serum

0.9-4.3 ng/mL

297-1419 pmol/L

C-reactive protein (CRP)

Serum

$< 0.5 = \text{""}$

$< 0.005 = \text{""}$

C-reactive protein, highly sensitive (hsCRP)

Serum

< 1.1="">

< 0.0011="">

Creatine kinase (CK)

Serum

30-170 U/L

0.5-2.83 mckat/L

Creatinine

Serum

0.7-1.3 mg/dL

61.9-115 mcmol/L

d-Dimer

Plasma

≤ 300 ng/mL

≤ 300 mcg/L

Dehydroepiandrosterone sulfate (DHEA-S):

Females Plasma

0.6-3.3 mg/mL

1.6-8.9 mcmol/L

Males Plasma

1.3-5.5 mg/mL

3.5-14.9 mcmol/L

Delta-aminolevulinic acid (ALA)

Serum

15-23 mcg/L

1.14-1.75 mcmol/L

11-Deoxycortisol (DOC):

After metyrapone Plasma

7 mcg/dL

203 nmol/L

Basal Plasma

< 5="">

< 145="">

d-Xylose level 2 h after ingestion of 25 g of d-xylose

Serum

20 mg/dL

1.3 nmol/L

Epinephrine, supine

Plasma

< 75="">

< 410="">

Erythrocyte sedimentation rate (ESR):

Females Blood

0-20 mm/h

0-20 mm/h

Males Blood

0-15 mm/h

0-20 mm/h

Erythropoietin

Serum

4.0-18.5 mIU/mL

4.0-18.5 IU/L

Estradiol, females:

Day 1-10 of menstrual cycle Serum

14-27 pg/mL

50-100 pmol/L

Day 11-20 of menstrual cycle Serum

14-54 pg/mL

50-200 pmol/L

Day 21-30 of menstrual cycle Serum

19-40 pg/mL

70-150 pmol/L

Estradiol, males

Serum

10-30 pg/mL

37-110 pmol/L

Ferritin:

Females Serum

30-200 ng/mL

30-200 mcg/L

Males Serum

30-300 ng/mL

30-300 mcg/L

α -Fetoprotein (AFP)

Serum

0-20 ng/dL

0-20 pg/L

Fibrinogen

Plasma

150-350 mg/dL

1.5-3.5 g/L

Folate (folic acid):

RBC Blood

160-855 ng/mL

362-1937 nmol/L

Serum Serum

2.5-20 ng/mL

5.7-45.3 nmol/L

Follicle-stimulating hormone (FSH), females:

Follicular or luteal phase Serum

5-20 mU/mL

5-20 U/L

Midcycle peak Serum

30-50 mU/mL

30-50 U/L

Postmenopausal Serum

- 35 mU/mL
- 35 U/L

Follicle-stimulating hormone (FSH), adult males

Serum

5-15 mU/mL

5-15 U/L

Fructosamine

Plasma

200-285 mol/L

—

Gamma-glutamyl transpeptidase (GGT)

Serum

8-78 U/L

—

Gastrin

Serum

0-180 pg/mL

0-180 ng/L

Globulins:

Serum

2.5-3.5 g/dL

25-35 g/L

Alpha-1 globulins Serum

0.2-0.4 g/dL

2-4 g/L

Alpha-2 globulins Serum

0.5-0.9 g/dL

5-9 g/L

Beta globulins Serum

0.6-1.1 g/dL

6-11 g/L

Beta-2 microglobulin Serum

0.7-1.8 mcg/mL

—

Gamma globulins Serum

0.7-1.7 g/dL

7-17 g/L

Glucose:

2-h postprandial Plasma

< 140="">

< 7.8="">

Fasting Plasma

70-105 mg/dL

3.9-5.8 mmol/L

Glucose-6-phosphate dehydrogenase (G6PD)

Blood

5-15 U/g Hb

0.32-0.97 mU/ mol Hb

γ-Glutamyl transpeptidase (GGT)

Serum

8-78 U/L

—

Growth hormone:

After oral glucose Plasma

< 2=“”>

< 2=“”>

In response to provocative stimuli Plasma

- 7 ng/mL
- 7 mcg/L

Haptoglobin

Serum

30-200 mg/dL

300-2000 mg/L

Hematocrit:

Females Blood

36-47%

—

Males Blood

41-51%

—

Hemoglobin:

Females Blood

12–16 g/dL

120–160 g/L

Males Blood

14–17 g/dL

140–170 g/L

Hemoglobin A1c

Blood

4.7–8.5%

—

Hemoglobin electrophoresis, adults:

Hb A1 Blood

95–98%

—

Hb A2 Blood

2–3%

—

Hb C Blood

0%

—

Hb F Blood

0.8–2.0%

—

Hb S Blood

0%

—

Hemoglobin electrophoresis, Hb F in children:

Neonate Blood

50–80%

—

1-6 mo Blood

8%

—

6 mo

Blood

1-2%

—

Homocysteine:

Females Plasma

0.40-1.89 mg/L

3-14 mcmol/L

Males Plasma

0.54-2.16 mg/L

4-16 mcmol/L

Human chorionic gonadotropin (hCG), quantitative

Serum

< 5="">

—

Immunoglobulins:

IgA Serum

70-300 mg/dL

0.7-3.0 g/L

IgD Serum

< 8="">

< 80="">

IgE Serum

0.01-0.04 mg/dL

0.1-0.4 mg/L

IgG Serum

640-1430 mg/dL

6.4-14.3 g/L

IgG1 Serum

280-1020 mg/dL

2.8-10.2 g/L

IgG2 Serum

60-790 mg/dL

0.6-7.9 g/L

IgG3 Serum

14-240 mg/dL

0.14-2.4 g/L

IgG4 Serum

11-330 mg/dL

0.11-3.3 g/L

IgM Serum

20-140 mg/dL

0.2-1.4 g/L

Insulin, fasting

Serum

1.4-14 mIU/mL

10-104 pmol/L

International normalized ratio (INR):

Therapeutic range (standard intensity therapy) Plasma

2.0-3.0

—

Therapeutic range in patients at higher risk (eg, patients with prosthetic heart valves) Plasma

2.5–3.5

—

Therapeutic range in patients with lupus anticoagulant Plasma

3.0–3.5

—

Iron

Serum

60–160 mcg/dL

11–29 mcmol/L

Iron-binding capacity, total (TIBC)

Serum

250–460 mcg/dL

45–82 mcmol/L

Lactate dehydrogenase (LDH)

Serum

60–160 U/L

1–1.67 mckat/L

Lactic acid, venous

Blood

6–16 mg/dL

0.67–1.8 mmol/L

Lactose tolerance test

Plasma

15 mg/dL increase in plasma glucose level

0.83 mmol/L increase in plasma glucose level

Lead

Blood

< 40=" ">

< 1.9=" ">

Leukocyte alkaline phosphatase (LAP) score

Peripheral blood smear

13-130/100/ polymorphonuclear (PMN) leukocyte neutrophils and bands

—

Lipase

Serum

< 95=" ">

< 1.58=" ">

Lipoprotein (a) [Lp(a)]

Serum

≤ 30 mg/dL

< 1.1=" ">

Luteinizing hormone (LH), females:

Follicular or luteal phase Serum

5-22 mU/mL

5-22 U/L

Midcycle peak Serum

30-250 mU/mL

30-250 U/L

Postmenopausal Serum

30 mU/mL

30 U/L

Luteinizing hormone, males

Serum

3-15 mU/mL

3-15 U/L

Magnesium

Serum

1.5–2.4 mg/dL

0.62–0.99 mmol/L

Manganese

Serum

0.3–0.9 ng/mL

5.5–16.4 nmol/L

Mean corpuscular hemoglobin (MCH)

Blood

28–32 pg

—

Mean corpuscular hemoglobin concentration (MCHC)

Blood

32–36 g/dL

320–360 g/L

Mean corpuscular volume (MCV)

Blood

80–100 fL

—

Metanephrines, fractionated:

Metanephrines, free Plasma

< 0.50=“”>

—

Normetanephrines, free Plasma

< 0.90=“”>

—

Methemoglobin

Blood

<>

—

Methylmalonic acid (MMA)

Serum

150–370 nmol/L

—

Myeloperoxidase (MPO) antibodies

Serum

< 6.0=“”>

—

Myoglobin:

Females Serum

25–58 mcg/L

1.4–3.5 nmol/L

Males Serum

28–72 mcg/L

1.6–4.1 nmol/L

Norepinephrine, supine

Plasma

50–440 pg/mL

0.3–2.6 nmol/L

N-Terminal propeptide of BNP (NT-proBNP)

Plasma

< 125=“”>

—

5'-Nucleotidase (5'NT)

Serum

4–11.5 U/L

—

Osmolality

Plasma

275–295 mOsm/kg H₂O

275–295 mmol/ kg H₂O

Osmotic fragility test

Blood

Increased fragility if hemolysis occurs in > 0.5% sodium chloride

Decreased fragility if hemolysis is incomplete in 0.3% sodium chloride

—

Oxygen partial pressure (PO₂)

Blood

80–100 mm Hg

—

Parathyroid hormone (PTH)

Serum

10–65 pg/mL

10–65 ng/L

Parathyroid hormone–related peptide (PTHrP)

Plasma

< 2.0=“”>

—

Partial thromboplastin time, activated (aPTT)

Plasma

25–35 sec

—

pH

Blood

7.38–7.44

—

Phosphorus, inorganic

Serum

3.0–4.5 mg/dL

0.97–1.45 mmol/L

Platelet count

Blood

150–350 x 10³/mCL

150–350 x 10⁹/L

Platelet life span, using chromium-51 (⁵¹Cr)

—

8–12 days

—

Porphyrins

Plasma

≤ 1.0 mcg/dL

—

Potassium

Serum

3.5–5 mEq/L

3.5–5 mmol/L

Prealbumin (transthyretin)

Serum

18–45 mg/dL

—

Progesterone:

Follicular phase Serum

< 1="">

< 0.03="">

Luteal phase Serum

3-30 ng/mL

0.1-0.95 nmol/L

Prolactin:

Females (nonpregnant) Serum

< 20="">

< 870="">

Males Serum

< 15="">

< 652="">

Prostate-specific antigen, total (PSA-T)

Serum

0-4 ng/mL

—

Prostate-specific antigen, ratio of free to total (PSA-F:PSA-T)

Serum

0.25

—

Protein C activity

Plasma

67-131%

—

Protein C resistance, activated ratio (APC-R)

Plasma

2.2-2.6

—

Protein S activity

Plasma

82-144%

—

Protein, total

Serum

6-7.8 g/dL

60-78 g/L

Prothrombin time (PT)

Plasma

11-13 sec

—

Pyruvic acid

Blood

0.08-0.16 mmol/L

—

RBC count

Blood

4.2-5.9 x 10⁶ cells/mcL4.2-5.9 x 10¹² cells/LRBC survival rate, using ⁵¹Cr

Blood

T_{1/2} = 28 days

—

Renin activity, plasma (PRA), upright, in males and females aged 18-39 yr:

Sodium-depleted Plasma

2.9-24 ng/mL/h

—

Sodium-repleted Plasma

0.6 (or lower)–4.3 ng/mL/h

—

Reticulocyte count:

Percentage Blood

0.5–1.5%

—

Absolute Blood

23–90 x 10³/mCL

23–90 x 10⁹/L

Rheumatoid factor (RF), by nephelometry

Serum

< 40="">

< 40="">

Sodium

Serum

136–145 mEq/L

136–145 mmol/L

Testosterone (total), adults:

Females Serum

20–75 ng/dL

0.7–2.6 nmol/L

Males Serum

300–1200 ng/dL

10–42 nmol/L

Thrombin time

Plasma

18.5–24 sec

—

Thyroid iodine-123 (123I) uptake

—

5-30% of administered dose at 24 h

—

Thyroid-stimulating hormone (TSH)

Serum

0.5-5.0 mIU/mL

0.5-5.0 mIU/L

Thyroxine (T4):

Free Serum

0.9-2.4 ng/dL

12-31 pmol/L

Free index —

4-11

—

Total Serum

5-12 mcg/dL

64-155 nmol/L

Transferrin

Serum

212-360 mg/dL

2.1-3.6 g/L

Transferrin saturation

Serum

20-50%

—

Triglycerides (fasting)

Serum

< 250=" ">

< 2.82=" ">

Triiodothyronine (T3):

Uptake Serum

25-35%

—

Total Serum

70-195 ng/dL

1.1-3.0 nmol/L

Troponin I

Plasma

< 0.1=" ">

< 0.1=" ">

Troponin T

Serum

 ≤ 0.03 ng/mL ≤ 0.03 mcg/L

Urea nitrogen (BUN)

Serum

8-20 mg/dL

2.9-7.1 mmol/L

Uric acid

Serum

2.5-8 mg/dL

0.15-0.47 mmol/L

Vitamin B12

Serum

200–800 pg/mL

148–590 pmol/L

Vitamin C (ascorbic acid):

Leukocyte Blood

< 20="">

< 1136="">

Total Blood

0.4–1.5 mg/dL

23–85 mcmol/L

Vitamin D:

1,25-Dihydroxycholecalciferol (calcitriol) Serum

25–65 pg/mL

65–169 pmol/L

25-Hydroxycholecalciferol Serum

15–80 ng/mL

37–200 nmol/L

WBC count

Blood

4.5–11 x 10³ cells/mcL

4.5–11 x 10⁹ cells/L

Segmented neutrophils

2.6–8.5 x 10³ cells/mcL

2.6–8.5 x 10⁹ cells/L

Band neutrophils

0–1.2 x 10³ cells/mcL

0–1.2 x 10⁹ cells/L

Lymphocytes

0.77–4.5 x 10³ cells/mcL

0.77-4.5 x 10⁹ cells/L

Monocytes

0.14-1.3 x 10³ cells/mcL

0.14-1.3 x 10⁹ cells/L

Eosinophils

0-0.55 x 10³ cells/mcL

0-0.55 x 10⁹ cells/L

Basophils

0-0.22 x 10³ cells/mcL

0-0.22 x 10⁹ cells/L

Zinc

Serum

66-110 mcg/dL

10.1-16.8 mcmol/L

*American Board of Internal Medicine: ABIM Laboratory Test Reference Ranges- January 2018.
Accessed 8/25/18.

mckat = microkatal; pkat = picokatal.

Test

Specimen

Conventional Units

SI Units

From:

<https://neurosurgerywiki.com/wiki/> - **Neurosurgery Wiki**

Permanent link:

https://neurosurgerywiki.com/wiki/doku.php?id=laboratory_values

Last update: **2024/06/07 02:49**

