Chemistry Reference Intervals

Effective August 2026

HNL Lab Medicine

General Chemistry		
Assay	**Age**	**Reference Interval**
Albumin (ALB), g/dL	0–<15 days	3.1–4.3
	15 days–<1 yr	2.8–4.8
	1–<8 yrs	3.8–4.7
	8–<15 yrs	3.9–4.9
	15–<19 yrs	3.8–5.2
	≥19 yrs	3.5–5.7
Alkaline Phosphatase (ALPH), U/L	0–<15 days	76–233
	15 days–<1 yr	113–443
	1–<10 yrs	132–315
	10–<13 yrs	119–393
	13–<15 yrs (F)	52–239
	13–<15 yrs (M)	107–442
	15–<17 yrs (F)	45–108
	15–<17 yrs (M)	75–312
	17–<19 yrs (F)	40–80
	17–<19 yrs (M)	49–139
	≥19 yrs	35–120
Alanine Aminotransferase (ALT), U/L	All Ages	<56
Ammonia (NH4), µmol/L	All Ages	18–72
Amylase (AMYL), U/L	0–<15 days	<10
	15 days–<13 weeks	<17
	13 weeks–<1 yr	<38
	1–<19 yrs	18–76
	≥19 yrs	<101
Aspartate Aminotransferase (AST/SGOT), U/L	0–<15 days	30–146
	15 days–<1 yr	19–61
	1–<7 yrs	20–40
	7–<12 yrs	17–33
	12–<19 yrs (F)	12–24
	12–<19 yrs (M)	13–32
	≥19 yrs	<41
β-Hydroxybutyrate (BHBA), mmol/L	0–17 yrs	0.02–0.29
	≥18 yrs	0.00–0.42
Blood Urea Nitrogen (BUN), mg/dL	0–<15 days	3–22
	15 days–<1 yr	4–17
	1–<10 yrs	9–22
	10–<19 yrs	7–20
	≥19 yrs (F)	7–25
	≥19 yrs (M)	7–28
C-Reactive Protein (CRP), mg/L	All Ages	< 10.0
Calcium (CA), mg/dL	0–<12 yrs	8.6–10.3
	≥12 yrs	8.5–10.5
Carbon Dioxide/Bicarbonate (CO2), mmol/L	All Ages	21–31

Chloride (CL), mmol/L	All Ages	100–109
Cholesterol (CHOL), mg/dL	All Ages	<200
Complement 3 (C3), mg/dL	All Ages	87–200
Complement 4 (C4), mg/dL	All Ages	19.0–52.0
Creatinine (CREAT), mg/dL	0–<15 days	0.30–0.90
	15 days–<2 yrs	0.10–0.40
	2–<5 yrs	0.20–0.40
	5–<12 yrs	0.30–0.60
	12–<15 yrs	0.50–0.80
	15–<19 yrs (F)	0.50–0.80
	15–<19 yrs (M)	0.60–1.10
	≥19 yrs (F)	0.40–1.10
	≥19 yrs (M)	0.53–1.30
Creatine Kinase (CK), U/L	All Ages	30–223
Cystatin C (CYSGF), mg/L	All Ages	0.53–1.20
Direct Bilirubin (DBIL), mg/dL	0–<15 days	0.2–0.4
	15 days–<1 yr	0.0–0.2
	1–<9 yrs	0.0–0.1
	9–<19 yrs	0.0–0.2
	≥19 yrs	0.0–0.2
Ethanol (ETOH), mg/dL	All Ages	<10
Gamma-Glutamyltransferase (GGT), U/L	All Ages	9–64
Glomerular Filtration Rate, estimated (eGFR)	<18 yrs	Not performed on patients less than 18 years of age or greater than 97 years of age
	18–97 yrs	>59
	>97 yrs	Not performed on patients less than 18 years of age or greater than 97 years of age
	Sex: Unknown	Not performed when sex is unknown
Glucose (GLUC), mg/dL	<7 days	47–110
	≥7 days	70–99
HDL Direct, Cholesterol (HDLD), mg/dL	All Ages	23–92
Hemoglobin A1c with eAG (HA1CG), %	All Ages	<5.7
High Sensitivity CRP (HSCRP), mg/L	All Ages	<3.0
Homocysteine (HCYS), µmol/L	<60 yrs	5.0–15.0
	>60 yrs	5.0–20.0
Iron (IRN), ug/dL	All Ages	50–212
Lactate (LACT), mmol/L	All Ages	0.5–2.0
Lactate Dehydrogenase (LD), U/L	0–<15 days	256–1017
	15 days–< 1 yr	135–375
	1–<10 yrs	159–266
	10–<15 yrs (F)	130–225
	10–<15 yrs (M)	141–235
	15–<19 yrs	107–207
	≥19 yrs	140–271
LDL Direct, Cholesterol (LDL), mg/dL	All Ages	<100
Lipase (LIPS), U/L	All Ages	11–82
Magnesium (MG), mg/dL	0–<15 days	1.9–3.8
	15 days–<1 yr	1.9–3.0
	1–<19 yrs	2.0–2.7
	≥19 yrs	1.4–2.2

Phosphorus (PHOS), mg/dL	0–<15 days	5.4–10.4
	15 days– <1 year	4.5–8.2
	1–< 5 yrs	4.2–6.7
	5–<13 yrs	3.9–5.8
	13–<16 yrs (F)	3.0–5.4
	13–<16 yrs (M)	3.3–6.1
	16–<19 yrs	3.0–4.8
	≥19 yrs	2.3–4.6
Potassium (K), mmol/L	<11 Days	3.7–5.9
	≥11 Days	3.5–5.2
Prealbumin (PREA), mg/dL	All Ages	17.0–34.0
Rheumatoid Factor (RF), IU/mL	All Ages	<15
Sodium (NA), mmol/L	All Ages	135–145
Total Bilirubin (TBIL), mg/dL	0–<1 day	0.2–8.0
	1 day–<2 days	0.2–11.0
	2–14 days	0.2–13.0
	15 days–<1 yr	0.1–0.7
	1–<9 yrs	0.1–0.4
	9–<12 yrs	0.1–0.6
	12–<15 yrs	0.2–0.7
	15–<19 yrs	0.2–0.8
	≥19 yrs	0.2–1.4
Total Protein (TP), g/dL	0–<15 days	5.2–7.9
	15 days–<1 yr	4.3–6.8
	1–<6 yrs	5.9–7.2
	6–<19 yrs	6.2–7.7
	≥19 yrs	6.3–8.3
Transferrin (TRAN), mg/dL	All Ages	203–362
Triglycerides (TRIG), mg/dL	All Ages	<150
Uric Acid (UA), mg/dL	0–<15 days	2.9–12.4
	15 days–<1 yr	1.7–6.3
	1–<12 yrs	1.9–4.9
	12–<19 yrs (F)	2.7–5.8
	12–<19 yrs (M)	2.7–7.5
	≥19 yrs (F)	2.4–6.0
	≥19 yrs (M)	3.5–7.0

Immunoassay

Assay	Age	Reference Interval
Alpha Fetoprotein (AFP), ng/mL	All Ages	<9.0
Anti-Müllerian Hormone (AMHO), ng/mL	<18 yrs (F)	No Reference Range Established
	18–25 yrs (F)	1.02–14.63
	26–30 yrs (F)	0.69–13.39
	31–35 yrs (F)	0.36–10.07
	36–40 yrs (F)	0.18–5.68
	41–45 yrs (F)	0.01–2.99
	>45 yrs (F)	No Reference Range Established
	All Ages (M)	No Reference Range Established
Anti-Thyroid Peroxidase Antibody - TPO AutoAb (ATPO), IU/mL	All Ages	<9

Thyroglobulin Auto-Ab (ATGAB or THAAB), IU/mL	All Ages	<4
B-Type Natruiretic Peptide (BNPT), pg/mL	All Ages	0–100
Beta-hCG (BHCG), mIU/mL	All Ages	Male: <2
		Female: <5
Breast Cancer Antigen 15-3 (CA153), U/mL	All Ages	<31.3
GI Monitor (CA 19-9), U/mL	All Ages	<36
Ovarian Cancer Antigen 125 (CA125), U/mL	All Ages	<35
Carcinoembryonic Antigen (CEAA), ng/mL	All Ages	<3.0
Cortisol (CORT), ug/dL	All Ages	AM: 6.7–22.2 ug/dL PM: <10.0 ug/dL
Creatine Kinase Isoenzyme MB (CKMBM), ng/mL	All Ages	<6.4
Dehydroepiandrosterone Sulfate (DHES), ug/dL	18–21 yrs (F)	51–321
	18–21 yrs (M)	24–537
	21–30 yrs (F)	18–391
	21–30 yrs (M)	85–690
	31–40 yrs (F)	23–266
	31–40 yrs (M)	106–464
	41–50 yrs (F)	19–231
	41–50 yrs (M)	70–495
	51–60 yrs (F)	8–188
	51–60 yrs (M)	38–313
	61–70 yrs (F)	12–133
	61–70 yrs (M)	24–244
	≥71 yrs (F)	7–177
	≥71 yrs (M)	5–253
Estradiol (ESTR), pg/mL	<19 yrs (M)	No Reference Range Established
	≥19 yrs (M)	<33.1
	All Ages (F)	**Non Pregnant Females** Early Follicular (-14 to -10 days) 20.0–157.0 pg/mL Mid Follicular (-9 to -4 days) 20.7–139.0 pg/mL Ovulatory Peak (0 Days) 19.3–622.0 pg/mL Mid Luteal (+4 to +11 days) 25.8–279.0 pg/mL Postmenopausal not on HRT <30.0 pg/mL
Ferritin (FRTN), ng/mL	All Ages (F)	11.0–306.8
	All Ages (M)	23.9–336.2
Folate (FLAC), ng/mL	All Ages	>5.8
Follicle Stimulating Hormone (FSH), mIU/mL	All Ages (M)	1.27–19.26
	All Ages (F)	Mid-Follicular Phase: 3.58–8.78 mIU/mL Mid-cycle Peak: 4.54–22.51 mIU/mL Mid-Luteal Phase: 1.79–5.12 mIU/mL Postmenopausal: 16.74–113.59 mIU/mL
Free PSA (FPSAG), ng/mL	All Ages	No Reference Range Established
Free T3 (FT3), pg/mL	All Ages	2.50–3.90
Free T4 (FT4), ng/dL	All Ages	0.61–1.58
High Sensitivity Troponin (HSTRP, MIRO, MIRO1), ng/L	All Ages (F)	≤12
	All Ages (M)	≤20
Intact PTH (INPH), pg/mL	All Ages	12.0–88.0

Luteinizing Hormone (LH), mIU/mL	All Ages (M)	1.24–8.62
	All Ages (F)	Mid-Follicular Phase: 2.12–10.89 mIU/mL Mid-cycle Peak: 19.18–103.03 mIU/mL Mid-Luteal Phase: 1.20–12.86 mIU/mL Postmenopausal: 10.87–58.64 mIU/mL
Procalcitonin (PCT), ng/mL	All Ages	PCT ≤0.5 ng/mL: Systemic infection (sepsis) is not likely. Local bacterial infection is possible PCT >0.5 and ≤ to 2 ng/mL: Systemic infection (sepsis) is possible, but other conditions are known to elevate PCT as well PCT >2 ng/mL: Systemic infection (sepsis) is likely, unless other causes are known PCT ≥10 ng/mL: Important systemic inflammatory response, almost exclusively due to severe bacterial sepsis or septic shock Note: Clinical correlation is required for the interpretation of this test
Progesterone (PGTR), ng/mL	All Ages (M)	0.14–8.62
	All Ages (F)	**Non Pregnant Females** Mid-Follicular Phase 0.31–1.52 ng/mL Mid-Luteal Phase 5.16–18.56 ng/mL Postmenopausal <0.78 ng/mL **Pregnant Females** First Trimester 4.73–50.74 ng/mL Second Trimester: 19.41–45.30 ng/mL
Prolactin (PLTN), ng/mL	All Ages (M)	2.64–13.13
	All Ages (F)	Premenopausal: 3.34–26.72 ng/mL Postmenopausal: 2.74–19.64 ng/mL
PSA Total (PSAST), ng/mL	All Ages	<4.00
PTH - Intraoperative (PTIOP), pg/mL	All Ages	12.0–88.0
Sex Hormone Binding Globulin (SEXHB), nmol/L	<20 yrs (F)	No Reference Range Established
	>20 yrs (F)	20-46 yrs: 18.2–135.5 nmol/L Postmenopausal: 16.8–125.2 nmol/L
	<20 yrs (M)	No Reference Range Established
	20–50 yrs (M)	13.3–89.5
	>50 yrs (M)	No Reference Range Established
T3,Total (T3T), ng/mL	All Ages	0.87–1.78
T4, Total (T4), ug/dL	All Ages	6.09–12.23
Testosterone, Total (TTTR), ng/dL	<21 yrs (F)	No Reference Range Established
	>21–<73 yrs (F)	<75
	>73 yrs (F)	No Reference Range Established
	<18 yrs (M)	No Reference Range Established
	18–30 yrs (M)	259–816
	31–44 yrs (M)	198–679
	45–66 yrs (M)	150–684
	>66 yrs (M)	No Reference Range Established
Thyroglobulin (THYG), ng/mL	All Ages	1.59–50.03

Thyroid Stimulating Hormone (TSH), µIU/mL	0–<12 yrs	0.79–5.85
	12–<19 yrs	0.68–3.35
	≥19 yrs	0.45–5.33
Vitamin B12 (VB12), pg/mL	All Ages	180–914

Therapeutic Drugs

Assay	Age	Reference Interval
Acetaminophen (ACT), µg/mL	All Ages	10–30
Carbamezapine (CARB), µg/mL	All Ages	4.0–12.0
Digoxin (DIG), ng/mL	All Ages	0.8–2.0
Gentamicin (GENP,GENT, GENR), µg/mL	All Ages	Peak: 4.0–8.0
		Trough: 1.0–2.0
		Random: No Reference Range Established
Lithium (LITH), mmol/L	All Ages	Minimum effective concentration: 0.6 mmol/L 12 Hr Post Dose Trough Concentration: 1.0–1.2 mmol/L
Phenobarbital (PHEN), µg/mL	All Ages	10.0–40.0
Phenytoin (DILN), µg/mL	All Ages	10.0–20.0
Salicylate (SALI), mg/dL	All Ages	Analgesic: <6 mg/dL Anti-inflammatory: 15–30 mg/dL
Theophylline (THEO), µg/mL	All Ages	10.0–20.0
Valproic Acid (VALP), µg/mL	All Ages	50–100
Vancomycin (VANP, VANT, VANC), µg/mL	All Ages	Peak: 18.0–40.0
		Trough: 10.0–20.0
		Random: No Reference Range Established

Urines

Assay	Age	Reference Interval
Urine Drug Screen (DOA9), POS/NEG	All Ages	Negative
Random Urine, Albumin (RMALB), mg/dL	All Ages	<3.0
Random Urine, Amylase (RUAM), U/L	All Ages (F)	21–447
	All Ages (M)	16–491
Random Urine, Calcuim (RUCA), mg/dL	All Ages	No Reference Range Established
Random Urine, Chloride (RUCL), mmol/L	All Ages	No Reference Range Established
Random Urine, Creatinine (RUCR), mg/dL	All Ages	50.0–200.0
Random Urine, Glucose (RUGL), mg/dL	All Ages	1–15
Random Urine, Magnesium (RUMG), mg/dL	All Ages	No Reference Range Established
Random Urine, Phosphorous (RUPO), mg/dL	All Ages	No Reference Range Established
Random Urine, Potassium (RUK), mmol/L	All Ages	20.0–125.0
Random Urine, Sodium (RUNA), mmol/L	All Ages	10–300
Random Urine, Total Protein (RUTP), mg/dL	All Ages	<14.0
Random Urine, Uric Acid (RUUA), mg/dL	All Ages	No Reference Range Established
Random Urine, Urea Nitrogen (RUUN), mg/dL	All Ages	No Reference Range Established
24-hour Urine, Albumin (24ALB), mg/24hr	All Ages	<30.0
24-hour Urine, Amylase (24AM), U/24hrs	All Ages	No Reference Range Established
24-hour Urine, Calcium (24CA), mg/24hr	All Ages	100–300
24-hour Urine, Chloride (24CL), mmol/24hrs	All Ages	110–250
24-hr Urine, Creatinine (1PV & 24CRE), g/kg/24hrs	All Ages(F)	0.011–0.020
	All Ages(M)	0.014–0.026

24-hour Urine, Glucose (24GL), g/24hrs	All Ages	<0.5
24-hour Urine, Magnesium (24MG), mg/24hr	All Ages	24–255
24-hour Urine, Phosphorus (24PO), mg/24hr	All Ages	300.00–1300.00
24-hour Urine, Potassium (24K), mmol/24hrs	All Ages	25–125
24-hour Urine, Sodium (24NA), mmol/24 hrs	All Ages	40–220
24-hour Urine, Total Protein (24TP), g/24hrs	All Ages	0.050–0.080
24-hour Urine, Urea Nitrogen (24UN), g/24hrs	All Ages	7.00–16.00
24-hour Urine, Uric Acid (24UA), mg/24hrs	All Ages (F)	250–750
	All Ages (M)	250–800

Cerebral Spinal Fluid

Assay	Age	Reference Interval
CSF Glucose (CSFG), mg/dL	0–18 yrs	60–80
	≥19 yrs	40–70
CSF Lactate (CSLC), mmol/L	All Ages	1.1–2.4
CSF Protein (CSFP), mg/dL	0–14 days	<132
	15–28 days	<100
	29–42 days	<89
	43–56 days	<83
	>56 days	15–45

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