

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 (NH ₄), 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
Bilirubin, Direct (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

Bilirubin, Total (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	0.2-1.0	
Complement C3 (C3), mg/dL	All Ages	87-200
Complement C4 (C4), mg/dL	All Ages	19.0-52.0
Calcium (CA), mg/dL	0-<12 yrs	8.6-10.3
	≥12 yrs	8.5-10.1
Cholesterol (CHOL), mg/dL	All Ages	<200
Chloride (CL), mmol/L	All Ages	100-109
Carbon Dioxide (CO2), mmol/L	All Ages	21-31
Creatine Kinase, Isoenzyme MB (CKMBM), ng/mL	All Ages	<6.4
Creatine Kinase (CK), U/L	All Ages	30-223
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	
C-Reactive Protein(CRP), mg/L	All Ages	< 10.0
Ethanol (ETOH), mg/dL	All Ages	<10
Gamma-Glutamyltransferase (GGT), U/L	All Ages	9-64
Glucose (GLUC), mg/dL	<7 days	47-110
	≥7 days	65-99
Homocysteine (HCYS), μmol/L	<60 yrs	5.0-15.0
	>60 yrs	5.0-20.0
HDL Direct, Cholesterol (HDL), mg/dL	All Ages	23-92
High Sensitivity CRP (HSCR), mg/L	All Ages	<3.0
Iron (IRN), ug/dL	All Ages	50-212
Lactate (LACT), mmol/L	All Ages	0.5-2.2
LDL Direct, Cholesterol (LDL), mg/dL	All Ages	<100
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
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
Prealbumin (PREA), mg/dL	All Ages	17.0-34.0
Potassium (K), mmol/L	<11 Days	3.7-5.9
	≥11 Days	3.5-5.2
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
Rheumatoid Factor (RF), IU/mL	All Ages	<15
Sodium (NA), mmol/L	All Ages	135-145
Triglycerides (TRIG), mg/dL	All Ages	<150
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
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
TPO AutoAb (ATPO), IU/mL	All Ages	< 9
Thyroglobulin Auto-Ab (ATGAB or THAAB), IU/mL	All Ages	< 4

Beta-hCG (BHCG), mIU/mL	All Ages	Male: <2
		Non-Pregnant Female : <5
		Inconclusive: 5–25
		Gestational Ranges: 0.2–1 Week: 5–50 1–2 Weeks: 50–500 2–3 Weeks: 100–5000 3–4 Weeks: 50–10000 4–5 Weeks: 1000–50000 5–6 Weeks: 10000–100000 6–8 Weeks: 15000–200000 2–3 Months: 10000–100000
B-Type Natriuretic Peptide (BNPT), pg/mL	All Ages	0–100
Cancer Antigen 15-3 (CA153), U/mL	All Ages	<31.3
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 PM: <10
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
		Mid Follicular (-9 to -4 days) 20.7–139.0
		Ovulatory Peak (0 Days) 19.3–622.0
		Mid Luteal (+4 to +11 days) 25.8–279.0
Postmenopausal not on HRT <30.0		
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
		Mid-cycle Peak: 4.54–22.51
		Mid-Luteal Phase: 1.79–5.12
Postmenopausal: 16.74–113.59		
Free PSA (FPSAG) ng/mL	All Ages	No Reference Range Established

Ferritin (FRTN), ng/mL	All Ages	11.0–306.8 (F)
		23.9–336.2 (M)
Free T3 (FT3), pg/mL	All Ages	2.50–3.90
Free T4 (FT4), ng/dL	All Ages	0.61–1.12
High Sensitivity Troponin (HSTRP), ng/L	All Ages (F)	≤12
	All Ages (M)	≤20
Luteinizing Hormone (LH), mIU/mL	All Ages (M)	1.24–8.62
	All Ages (F)	Mid-Follicular Phase: 2.12–10.89
		Mid-cycle Peak: 19.18–103.03
		Mid-Luteal Phase: 1.20–12.86
		Postmenopausal: 10.87 – 58.64
PTH - Intraoperative (PTIOP),pg/mL	All Ages	12.0–88.0
PTH - Intact (INPH), pg/mL	All Ages	12.0–88.0
PSA Total (PSAST), ng/mL	All Ages	<4.0
Progesterone (PGTR), ng/mL	All Ages (M)	0.14–8.62
	All Ages (F)	Non Pregnant Females
		Mid-Follicular Phase 0.31–1.52
		Mid-Luteal Phase 5.16–18.56
		Postmenopausal <0.78
		Pregnant Females
		First Trimester 4.73–50.74
Second Trimester: 19.41–45.30		
Prolactin (PLTN), ng/mL	All Ages (M)	2.64–13.13
	All Ages (F)	Premenopausal: 3.34–26.72 Postmenopausal: 2.74–19.64
Sex Hormone Binding Globulin (SEXHB), nmol/L	<20 yrs (F)	No Reference Range Established
	>20 yrs (F)	20-46 yrs: 18.2–135.5
		Postmenopausal: 16.8–125.2
	<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
T3 Uptake (T3U), %	All Ages	32.0–48.4
T4, Total (T4), ug/dL	All Ages	6.09–12.23
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
Testosterone, Total (TTTR), ng/mL	<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	
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	0.6–1.2
Phenobarbital (PHEN), µg/mL	All Ages	10–40
Phenytoin (DILN), µg/mL	All Ages	10–20
Salicylate (SALI), mg/dL	All Ages	Analgesic: <6 mg/dL
		Anti-inflammatory:15–30 mg/dL
Theophylline (THEO), µg/mL	All Ages	10–20
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, Calcium (RUCA), mg/dL	All Ages	No Reference Range Established
Random Urine, Chloride (RUCL), mmol/L	All Ages	No Reference Range Established (Highly dependent on diet)
Random Urine, Creatinine (RUCR), mg/dL	All Ages	50.0–200.0
Random Urine, Glucose (RUGL), mg/dL	All Ages	1–15
Random Urine, Potassium (RUK), mmol/L	All Ages	20–125
Random Urine, Magnesium (RUMG), mg/dL	All Ages	No Reference Range Established
Random Urine, Sodium (RUNA), mmol/L	All Ages	10–300
Random Urine, Phosphorous (RUPO), mg/dL	All Ages	No Reference Range Established
Random Urine, Total Protein (RUTP), mg/dL	All Ages	<14
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/24hrs	All Ages	100–300
24-hour Urine, Glucose (24GL), g/24hrs	All Ages	<0.5
24-hour Urine, Magnesium (24MG), g/24hrs	All Ages	24–255
24-hour Urine, Phosphorus (24PO), mg/24hrs	All Ages	300.0–1300.0
24-hour Urine, Urea Nitrogen (24UN), g/24hrs	All Ages	7.00–16.00
24-hour Urine, Chloride (24CL), mmol/24hrs	All Ages	110–250

24-hour Urine, Creatinine (1PV & 24CRE), g/kg/24hrs	All Ages (F)	0.011–0.020
	All Ages (M)	0.014–0.026
24-hour Urine, Potassium (24K), mmol/24 hrs	All Ages	25–125
24-hour Urine, Sodium (24NA), mmol/24hrs	All Ages	40–220
24-hour Urine, Uric Acid (24UA), mg/24hrs	All Ages (F)	250–750
	All Ages (M)	250–800
24-hour Urine, Total Protein (24TP), g/24hrs	All Ages	0.050–0.080

Cerebral Spinal Fluid

Assay	Age	Reference Interval
CSF Glucose (CSFG), mg/dL	0–18 yrs	60–80
	≥19 yrs	40–70
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
CSF Lactate (CSLC), mmol/L	All Ages	1.1–2.4

Updated: 5/30/24