

Reference Ranges

Chemistry and Immunology

TEST	AGE/SEX	UNITS	REFERENCE RANGE
Acetaminophen 920		µg/mL	10.0 – 25.0
AFP, tumor 20 Alpha-fetoprotein		ng/mL	≤ 8.8
Albumin 17	0 up to 4 days	g/dL	2.8 – 4.4
	4 days up to 14 years	g/dL	3.8 – 5.4
	14 up to 18 years	g/dL	3.2 – 4.5
	18 up to 60 years	g/dL	3.5 – 5.2
	60 up to 90 years	g/dL	3.2 – 4.6
	≥90 years	g/dL	2.9 – 4.5
Alkaline phosphatase 908	1 up to 8 days	U/L	77 – 265
	8 up to 30 days	U/L	91 – 375
	1 up to 4 months	U/L	60 – 360
	4 up to 7 months	U/L	55 – 325
	7 months up to 1 yr	U/L	60 – 300
	1 up to 4 years	U/L	129 – 291
	4 up to 7 years	U/L	134 – 346
	7 up to 10 years	U/L	156 – 386
	10 up to 12 years	U/L	120 – 488
	12 up to 14 years	U/L	178 – 455
	14 up to 16 years	U/L	116 – 483
	16 up to 20 years	U/L	58 – 237
	≥ 20 years	U/L	50 – 136
ALT 254	0 up to 8 days	U/L	6 - 40
	8 up to 30 days	U/L	10 - 40
	30 days up to 4 months	U/L	13 - 39
	4 up to 7 months	U/L	12 - 42
	7 months up to 1 year	U/L	13 - 45
	1 up to 4 years	U/L	5 - 45
	4 up to 7 years	U/L	10 - 25
	7 up to 12 years	U/L	10 - 35
	12 – 14 years	U/L	10 - 55
	≥14 years	U/L	8 - 45
Ammonia 27	0 up to 30 days	µmol/L	21 – 95
	30 days up to 1 year	µmol/L	21 – 74
	1 up to 14 years	µmol/L	22 – 66
	≥ 14 years	µmol/L	11 – 35

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Amylase 31		IU/L	25 – 125
Amylase, timed urine 29		U/hr	1 – 17
Anion gap			5 – 18
Anti-TPO 4784		IU/mL	<5.61
AST 910	0 up to 7 days	IU/L	26 – 98
	7 up to 30 days	IU/L	16 – 67
	30 days up to 3 years	IU/L	16 – 60
	3 up to 6 years	IU/L	3 – 48
	6 up to 9 years	IU/L	3 – 42
	9 up to 18 years	IU/L	3 – 39
	≥ 18 years	IU/L	2 – 40
Bilirubin, direct 47		mg/dL	0.1 – 0.5
Bilirubin, indirect		mg/dL	0.2 – 0.8
Bilirubin, total 46	0 up to 2 days	mg/dL	< 7.0
	2 up to 5 days	mg/dL	< 6.0
	5 up to 30 days	mg/dL	< 4.0
	≥ 30 days	mg/dL	0.2 – 1.2
BUN 52	0 up to 2 years	mg/dL	4 – 15
	2 up to 18 years	mg/dL	8 – 18
	≥ 18 years	mg/dL	8 – 25
BUN/Creatinine ratio			10 – 20
C – peptide 265		ng/mL	0.78 – 5.19
C – reactive protein 674		mg/dL	< 0.5
CA 125 294		U/mL	≤ 35.0
CA 19-9 259		U/mL	≤ 37.0
CA 15-3 3551		U/mL	≤ 31.3
Calcium 56	0 up to 10 days	mg/dL	7.6 – 10.4
	10 days up to 2 years	mg/dL	9.0 – 11.0
	2 up to 12 years	mg/dL	8.8 – 10.8
	≥ 12 years	mg/dL	8.5 – 10.5
Calcium, random urine 341		mg/dL	≥ 2.0
Calcium, timed urine 57		mg/24hr	100 – 300

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Calcium/creatinine ratio 1044	0 up to 6 months		< 0.75
	6 up to 12 months		< 0.65
	1 up to 5 years		< 0.40
	5 up to 10 years		< 0.29
	10 up to 15 years		< 0.26
	≥ 15 years		< 0.20
Carbamazepine 952		µg/mL	4.0 – 10.0
CEA 664		ng/mL	< 5.0
Chloride 67		mmol/L	98 – 110
Chloride, random urine 1066		mmol/L	≥ 20
Chloride, timed urine 70		mmol/24 hr	110 – 250
Cholesterol 71		mg/dL	100 – 199
Cholesterol/HDL ratio			< 4.50
CK, total 80	Male, all ages	IU/L	30 – 200
	Female, all ages	IU/L	29 – 168
CKMB 946		ng/mL	≤ 7.0
CKMB index		None	< 5.0
CO2, total 73	0 up to 15 years	mmol/L	20 – 28
	≥ 15 years	mmol/L	21 – 31
Cortisol, total 8813	AM	µg/dL	5 – 25
	PM	µg/dL	2 – 13
Creatinine 82	0 up to 21 days	mg/dL	0.3 – 1.0
	21 days up to 5 years	mg/dL	0.2 – 0.5
	5 up to 10 years	mg/dL	0.3 – 0.7
	10 up to 15 years	mg/dL	0.5 – 1.0
	>15 years, Male	mg/dL	0.72 – 1.25
	>15 years, Female	mg/dL	0.57 – 1.11
Creatinine clearance 1054	Male	mL/min/1.73m ²	66 – 163
	Female	mL/min/1.73m ²	66 – 165
Creatinine, random urine 62	Male	mg/dL	63 – 166
	Female	mg/dL	47 – 110
Creatinine, timed urine 85	Male	mg/kg/24hr	12 – 28
	Female	mg/kg/24hr	11 – 26

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TEST	AGE/SEX	UNITS	REFERENCE RANGE
Cardio CRP 5664 C-Reactive Protein, High Sens		mg/L	< 1.0 low risk
		mg/L	1.0-3.0 mod risk
		mg/L	> 3.0 high risk
		mg/L	>10.0 may indicate increased cardiac risk or recent inflammatory process.
Dexamethasone suppression 68		µg/dL	< 5.0
DHEA-S 285	Male		
	14 up to 19 years	µg/dL	45.1 – 385.0
	19 up to 24 years	µg/dL	238.4 – 539.3
	24 up to 34 years	µg/dL	167.9 – 591.9
	34 up to 44 years	µg/dL	139.7 – 484.4
	44 up to 54 years	µg/dL	136.2 – 447.6
	54 up to 64 years	µg/dL	48.6 – 361.8
	64 up to 74 years	µg/dL	228.5 – 283.6
	≥ 74 years	µg/dL	None
	Female		
	14 up to 19 years	µg/dL	61.2 – 493.6
	19 up to 24 years	µg/dL	134.2 – 407.4
	24 up to 34 years	µg/dL	95.8 – 511.7
	34 up to 44 years	µg/dL	74.8 – 410.2
	44 up to 54 years	µg/dL	56.2 – 282.9
	54 up to 64 years	µg/dL	29.7 – 182.2
	64 up to 74 years	µg/dL	33.6 – 78.9
	≥ 74 years	µg/dL	None
Digoxin 92		ng/mL	0.5 – 2.0
Ethanol 19		g/dL	<0.010

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Estradiol 288	Male	pg/mL	< 45
	Female		
	Follicular	pg/mL	21 – 251
	Ovulatory (mid-cycle)	pg/mL	38 – 649
	Luteal	pg/mL	21 – 312
	Post-menopausal, not on HRT	pg/mL	<28
	Post-menopausal, on HRT	pg/mL	<144
Ferritin 102	Male		
	0 up to 30 days	ng/mL	25 – 200
	30 days up to 3 mo	ng/mL	200 – 600
	3 up to 6 months	ng/mL	50 – 200
	6 months up to 15 yrs	ng/mL	7 – 140
	≥ 15 years	ng/mL	22 – 275
	Female		
	0 up to 30 days	ng/mL	25 – 200
	30 days up to 3 mo	ng/mL	200 – 600
	3 up to 6 months	ng/mL	50 – 200
	6 months up to 15 yrs	ng/mL	7 – 140
	≥ 15 years	ng/mL	15 – 205
Folic Acid 103		ng/mL	≥ 4.0
FSH 104 Follicle Stimulating Hormone	Male	mIU/mL	1.0 – 12.0
	Female		
	Follicular	mIU/mL	3.0 – 8.1
	Ovulatory peak	mIU/mL	2.6 – 16.7
	Luteal	mIU/mL	1.4 – 5.5
	Post-Menopausal	mIU/mL	26.7 – 133.4

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TEST	AGE/SEX	UNITS	REFERENCE RANGE
Gamma GT 114 Gamma glutamyl transferase	Male		
	0 up to 1 month	IU/L	23 – 174
	1 up to 3 months	IU/L	16 – 147
	3 up to 6 months	IU/L	5 – 93
	6 up to 12 months	IU/L	8 – 38
	≥ 12 months	IU/L	12 – 64
	Female		
	0 up to 1 month	IU/L	16 – 140
	1 up to 3 months	IU/L	16 – 140
	3 up to 6 months	IU/L	13 – 123
	6 up to 12 months	IU/L	8 – 59
	≥ 12 months	IU/L	9 – 36
Gentamicin, peak 826		µg/mL	5.0 – 10.0
Gentamicin, random 832		µg/mL	≤ 12.0
Gentamicin, trough 827		µg/mL	< 1.5
Glucose, 1 hr gestational 1078		mg/dL	<140
Glucose, 2 hr post prandial 111		mg/dL	<140
Glucose, CSF 9110		mg/dL	40 – 70
Glucose, fasting 109		mg/dL	65 – 100
Glucose, random 7250	0 up to 5 hours	mg/dL	60 – 90
	≥ 5 hours	mg/dL	65 – 140
Glucose, timed urine 377		g/24 Hr	<0.5
Glucose tolerance, 2 hr 240	Fasting	mg/dL	65 - 100
	1 hour	mg/dL	65 - 200
	2 hour	mg/dL	65 - 140
Glucose tolerance, 3 hr 118 gestational	Fasting	mg/dL	65 - 95
	1 hour	mg/dL	65 - 180
	2 hour	mg/dL	65 - 155
	3 hour	mg/dL	65 - 140

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TEST	AGE/SEX	UNITS	REFERENCE RANGE
HCG Beta quant, pregnancy 690	Non-pregnant		
	Pre-menopausal	mIU/mL	<5.0
	Pregnant		
	3 - 4 weeks	mIU/mL	9 – 130
	4 - 5 weeks	mIU/mL	75 – 2600
	5 - 6 weeks	mIU/mL	850 – 20800
	6 - 7 weeks	mIU/mL	4000 – 100200
	7 - 12 weeks	mIU/mL	11500 – 289000
	12 - 16 weeks	mIU/mL	18300 – 137000
	16 - 29 weeks	mIU/mL	1400 – 53000
	29 - 41 weeks	mIU/mL	940 – 60000
HDL cholesterol 3631		mg/dL	>40
Hemoglobin A1C, monitoring 241	Not in control	%	≥8
	Fair control	%	7 – 7.9
	Good control	%	≤ 6.9
Hemoglobin A1C, screening 8761	Confirms diabetes	%	>6.4
	Indicates prediabetes	%	5.7 – 6.4
	Normal	%	≤5.6
Homocysteine, cardiac 4775		μmol/L	5.0 – 15.4
IgA Immunoglobulin A 1141	0 up to 5 months	mg/dL	7 – 37
	5 up to 9 months	mg/dL	16 – 50
	9 up to 15 months	mg/dL	27 - 66
	15 up to 24 months	mg/dL	36 - 79
	2 up to 4 years	mg/dL	27 - 246
	4 up to 7 years	mg/dL	29 - 256
	7 up to 10 years	mg/dL	34 - 274
	10 up to 13 years	mg/dL	42 - 295
	13 up to 16 years	mg/dL	52 - 319
	16 up to 18 years	mg/dL	60 - 337
	≥18 years	mg/dL	61 - 356

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TEST	AGE/SEX	UNITS	REFERENCE RANGE
IgG Immunoglobulin G 1140	0 up to 5 months	mg/dL	100 - 334
	5 up to 9 months	mg/dL	164 - 588
	9 up to 15 months	mg/dL	246 - 904
	15 up to 24 months	mg/dL	313 - 1170
	2 up to 4 years	mg/dL	295 - 1156
	4 up to 7 years	mg/dL	386 - 1470
	7 up to 10 years	mg/dL	462 - 1682
	10 up to 13 years	mg/dL	503 - 1719
	13 up to 16 years	mg/dL	509 - 1580
	16 up to 18 years	mg/dL	487 - 1327
	≥18 years	mg/dL	767 - 1590
IgM Immunoglobulin M 143	0 up to 5 months	mg/dL	26 - 122
	5 up to 9 months	mg/dL	32 - 132
	9 up to 15 months	mg/dL	40 - 143
	15 up to 24 months	mg/dL	46 - 152
	2 up to 4 years	mg/dL	37 - 184
	4 up to 7 years	mg/dL	37 - 224
	7 up to 10 years	mg/dL	38 - 251
	10 up to 13 years	mg/dL	41 - 255
	13 up to 16 years	mg/dL	45 - 244
	16 up to 18 years	mg/dL	49 - 201
	≥18 years	mg/dL	37 - 286
Insulin 141		μIU/mL	<16.1
Iron 1144	0 up to 2 months	μg/dL	100 – 250
	2 mos up to 2 years	μg/dL	40 – 100
	2 up to 12 years	μg/dL	50 – 120
	≥ 12 years, male	μg/dL	31 – 144
	≥ 12 years, female	μg/dL	25 – 156
Iron & iron binding capacity Fe/TIBC/% saturation 100	0 up to 4 months	μg/dL	50 – 170
	4 months up to 10 yrs	μg/dL	170 – 270
	10 up to 18 years	μg/dL	245 – 360
	≥ 18 years	μg/dL	245 – 400
Iron, % saturation		%	20 – 55
Lactic acid, arterial 12603		mmol/L	0.5 – 1.6
Lactic acid, venous 12616		mmol/L	0.5 – 2.0

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TEST	AGE/SEX	UNITS	REFERENCE RANGE
LD, total Lactate dehydrogenase	909		
	Male		
	0 up to 30 days	IU/L	178 – 629
	30 days up to 12 mos	IU/L	129 – 367
	12 mos up to 3 years	IU/L	164 – 286
	3 up to 6 years	IU/L	155 – 280
	6 up to 9 years	IU/L	141 – 237
	9 up to 13 years	IU/L	141 – 231
	13 up to 19 years	IU/L	117 – 217
	≥ 19 years	IU/L	125 – 220
	Female		
	0 up to 30 days	IU/L	187 – 600
	30 days up to 12 mos	IU/L	152 – 327
	12 mos up to 3 years	IU/L	164 – 286
	3 up to 6 years	IU/L	155 – 280
	6 up to 9 years	IU/L	141 – 237
	9 up to 13 years	IU/L	129 – 222
	13 up to 19 years	IU/L	117 – 217
	≥ 19 years	IU/L	125 – 220
LDL cholesterol, direct	5665		
	Risk category		LDL goal
	Vascular disease and/or diabetes		<100 mg/dL
	Multiple (2+) risk factors		<130 mg/dL
LH Luteinizing hormone			
	Male	mIU/mL	1.1 – 8.7
	Female		
	Follicular	mIU/mL	2.4 – 6.6
	Ovulatory	mIU/mL	9.1 – 74.2
	Luteal	mIU/mL	0.9 – 9.3
	Post-menopausal	mIU/mL	10.4 – 64.6
Lipase	157	IU/L	8 – 78
Lithium	169	mEq/L	1.0 – 1.5
Magnesium	175		
	0 up to 4 months	mg/dL	1.5 – 2.2
	4 months up to 6 years	mg/dL	1.7 – 2.3
	6 up to 12 years	mg/dL	1.7 – 2.1
	12 up to 20 years	mg/dL	1.7 – 2.2
	≥ 20 years	mg/dL	1.6 – 2.6

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TEST	AGE/SEX	UNITS	REFERENCE RANGE
Microalbumin, 24 hr urine 634			
Albumin excretion/min		µg/min	<20.0
Albumin excretion/24 hrs		mg/24 hrs	<30.0
Microalbumin, 24 hr		mg/g creat	<30.0
Microalbumin, random urine 630		mg/g creat	<30.0
Myoglobin, quant 7616	Male	ng/mL	<155
	Female	ng/mL	<106
Phenobarbital 207		µg/mL	15.0 – 40.0
Phenytoin, total 91		µg/mL	10.0 – 20.0
Phenytoin, total & free 90	Free	µg/mL	1.0 – 2.5
	Total	µg/mL	10.0 – 20.0
Phosphorus 205	0 up to 10 days	mg/dL	4.5 – 9.0
	10 days up to 1 yr	mg/dL	4.5 – 6.5
	1 up to 12 years	mg/dL	3.4 – 5.9
	≥ 12 years	mg/dL	2.3 – 4.7
Phosphorous, timed urine 206		g/24 Hr	0.4 – 1.3
Potassium 211	0 up to 7 days	mmol/L	3.7 – 5.7
	7 days up to 1 yr	mmol/L	4.1 – 5.3
	1 up to 12 years	mmol/L	3.4 – 4.7
	≥ 12 years	mmol/L	3.5 – 5.0
Potassium, timed urine 210		mmol/24 hr	25 – 125
Prealbumin 2455		mg/dL	18.0 – 38.0
Progesterone 257	Male	ng/mL	<0.2
	Female		
	Non pregnant		
	Follicular	ng/mL	<0.3
	Luteal	ng/mL	1.2 – 15.9
	Post-Menopausal	ng/mL	<0.2
	Pregnant		
	1 st trimester	ng/mL	2.8 – 147.3
	2 nd trimester	ng/mL	22.5 – 95.3
	3 rd trimester	ng/mL	27.9 – 242.5
Prolactin 215	Male	ng/mL	2.64 – 13.13
	Female		
	0 up to 50 years	ng/mL	3.34 – 26.72
	≥ 50 years	ng/mL	2.74 – 19.64
Protein/creatinine ratio, urine 2805		None	<0.2

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TEST		AGE/SEX	UNITS	REFERENCE RANGE
Protein quant, random urine	1184		mg/dL	1 – 14
Protein, timed urine	361		mg/24 hr	50 – 150
Protein, total	219	0 up to 7 days	g/dL	4.4 – 7.6
		7 days up to 1 year	g/dL	5.1 – 7.3
		1 up to 2 years	g/dL	5.6 – 7.5
		≥ 2 years	g/dL	6.0 – 8.0
	Globulin		g/dL	2.0 – 3.7
	A/G ratio			1.0 – 2.0
Protein, total, CSF	220		mg/dL	15 – 40
PSA, free	3166		Free PSA	Not specified
			% free PSA	>25
PSA, total, diagnostic	1097		ng/mL	<4.00
PSA, total, screen	1102		ng/mL	<4.00
Salicylate	228		mg/dL	15.0 – 30.0
Sodium	233	0 up to 10 years	mmol/L	135 – 143
		≥ 10 years	mmol/L	135 – 145
Sodium, timed urine	234		mmol/24 hr	40 – 200
Sol transferrin receptor	6330		mg/L	0.47 – 1.65
T3, free	388		pg/mL	1.71 – 3.71
T3, total	845		ng/dL	58 – 159
T4, total Thyroxine	847		µg/dL	4.9 – 11.7
T4, free	251		ng/dL	0.70 – 1.80
Testosterone, total	44	Male	ng/dL	241 – 827
		Female	ng/dL	14 – 53
Tobramycin, peak	849		µg/mL	4.0 – 10.0
Tobramycin, trough	829		µg/mL	≤ 1.5
Triglyceride	256		mg/dL	<150
Troponin I	5045		ng/mL	<0.034
TSH	258	0 up to 30 days	µIU/mL	0.43 – 16.10
		30 days up to 2 years	µIU/mL	0.62 – 8.05
		2 up to 7 years	µIU/mL	0.54 – 4.53
		7 up to 12 years	µIU/mL	0.66 – 4.14
		≥ 12 years	µIU/mL	0.35 – 4.94
Urea nitrogen, timed urine	264		g/24 hr	12.0 – 20.0

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Uric acid 262	Male		
	0 up to 1 year	mg/dL	2.0 — 5.5
	1 up to 18 years	mg/dL	3.5 — 7.3
	≥ 18 years	mg/dL	3.5 – 7.2
	Female		
	0 up to 1 year	mg/dL	2.0 — 5.5
	1 up to 18 years	mg/dL	3.5 — 7.3
	≥ 18 years	mg/dL	2.6 — 6.0
Uric acid, rasburicase 8290	Male		
	0 up to 1 year	mg/dL	2.0 – 5.5
	1 up to 18 years	mg/dL	3.5 – 7.3
	≥ 18 years	mg/dL	3.5 – 7.2
	Female		
	0 up to 1 year	mg/dL	2.0 – 5.5
	1 up to 18 years	mg/dL	3.5 – 7.3
	≥ 18 years	mg/dL	2.6 – 6.0
Uric acid, timed urine 263		mg/24 hr	250 – 750
Valproic acid, total 949		µg/mL	50.0 – 100.0
Valproic acid, free 6359		µg/mL	6.0 – 20.0
Vancomycin, peak 964		µg/mL	35.0 – 45.0
Vancomycin, trough 963		µg/mL	7.0 – 20.0
Vitamin B12 272		pg/mL	180 – 914
Vitamin D 25 (Deficiency) 113A		ng/mL	30.0 – 80.0