

Reference Ranges

Chemistry and Immunology

TEST	AGE/SEX	REFERENCE RANGE	UNITS
Acetaminophen 920		10.0 – 30.0	µg/mL
AFP (Alpha-fetoprotein), tumor 20		<=8.30	ng/mL
Albumin 17	0 days up to 4 days	2.8 – 4.4	g/dL
	4 days up to 14 years	3.8 – 5.4	g/dL
	14 years up to 18 years	3.2 – 4.5	g/dL
	18 years up to 999 years	4.0 – 4.9	g/dL
Alkaline phosphatase 908	Male		
	0 days up to 15 days	83 – 248	U/L
	15 days up to 1 year	122 – 469	U/L
	1 year up to 10 years	142 – 335	U/L
	10 years up to 13 years	129 – 417	U/L
	13 years up to 15 years	116 – 468	U/L
	15 years up to 17 years	82 – 331	U/L
	17 years up to 19 years	55 – 149	U/L
	19 years up to 999 years	40 – 129	U/L
	Female		
	0 days up to 15 days	83 – 248	U/L
	15 days up to 1 year	122 – 469	U/L
	1 year up to 10 years	142 – 335	U/L
	10 years up to 13 years	129 – 417	U/L
	13 years up to 15 years	57 - 254	U/L
	15 years up to 17 years	50 – 117	U/L
	17 years up to 19 years	45 – 87	U/L
	19 years up to 999 years	35 – 104	U/L
ALT 254	Male	10 – 50	U/L
	Female	10 - 35	U/L
Ammonia 27	Male	11 – 51	µmol/L
	Female	16 - 60	µmol/L

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Amylase 31		28 - 100	IU/L
Anion gap		5 - 18	
Anti-TPO 4784		< 34	IU/mL
AST 910	Male	10 - 50	IU/L
	Female	10 - 35	IU/L
Bilirubin, direct 47		0.0 - 0.3	mg/dL
Bilirubin, indirect 84		0.2 - 0.8	mg/dL
Bilirubin, total 46	Infant (0 - 2 days)	7.0 - 14.9	mg/dL
	Infant (2 - 5 days)	6.0 - 14.9	mg/dL
	Infant (5 - 30 days)	4.0 - 14.9	mg/dL
	Child (30 days to 18 years)	0.0 - 1.2	mg/dL
	> 18 years	0.0 - 1.2	mg/dL
BUN 52	Infant < 1 year	4 - 19	mg/dL
	Infant/Children (1 year up to 18 years)	5 - 18	mg/dL
	18 years up to 60 years	6 - 20	mg/dL
	60 years up to 90 years	8 - 23	mg/dL
BUN/Creatinine ratio		10 - 20	
C - peptide 265		1.10 - 4.40	ng/mL
C - reactive protein 674		< 0.5	mg/dL
CA 125 294		< 38.1	U/mL
CA 19-9 259		< 35	U/mL
CA 15-3 3551		< 25.0	U/mL

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Calcium 56	0 days up to 10 days	7.6 – 10.4	mg/dL
	10 days up to 2 years	9.0 – 11.0	mg/dL
	2 years up to 12 years	8.8 – 10.8	mg/dL
	12 years up to 18 years	8.4 – 10.2	mg/dL
	18 years up to 60 years	8.6 – 10.0	mg/dL
	60 years up to 999 years	8.8 – 10.2	mg/dL
Calcium, random urine 341		≥ 0.8	mg/dL
Calcium, timed urine 57		100 – 300	mg/24hr
Calcium/creatinine ratio 1044	0 days up to 6 months	< 0.75	
	6 months up to 12 months	< 0.65	
	1 year up to 5 years	< 0.40	
	5 years up to 10 years	< 0.29	
	10 years up to 15 years	< 0.26	
	≥ 15 years	< 0.20	
Carbamazepine 952		4.0 – 12.0	µg/mL
CEA 664	20 years up to 70 years (all subjects)	< 4.7	ng/mL
	40 years up to 70 years (all subjects)	< 5.2	ng/mL
	20 years up to 70 years (non smoker)	< 3.8	ng/mL
	40 years up to 70 years (non smoker)	< 5.0	ng/mL
	20 years up to 70 years (smoker)	< 5.5	ng/mL
	40 years up to 70 years (smoker)	< 6.5	ng/mL
Chloride 67		98 - 107	mmol/L
Chloride, random urine 1066		not defined	mmol/L
Chloride, timed urine 70		110 – 250	mmol/24 hr
Cholesterol 71	Desirable	< 200	mg/dL
	Borderline	200 – 239	mg/dL
	High	≥ 240	mg/dL

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Cholesterol/HDL ratio		< 4.50	
CK, total 80	Male	39 – 308	IU/L
	Female	26 – 192	IU/L
CKMB 946	Male	≤ 7.7	ng/mL
	Female	<4.3	ng/mL
CKMB index		< 5.0	
CO2, total 73		22 - 29	mmol/L
Cortisol, total 8813	AM	4.82 – 19.5	µg/dL
	PM	2.47 – 11.9	µg/dL
Creatinine 82	0 hours up to 24 hours	0.24 – 0.85	mg/dL
	24 hours up to 12 months	0.17 – 0.42	mg/dL
	1 month up to 3 years	0.24 – 0.42	mg/dL
	3 years up to 5 years	0.31 – 0.47	mg/dL
	5 years up to 7 years	0.32 – 0.59	mg/dL
	7 years up to 9 years	0.40 – 0.60	mg/dL
	9 years up to 11 years	0.39 – 0.73	mg/dL
	11 years up to 13 years	0.53 – 0.79	mg/dL
	13 years up to 15 years	0.57 – 0.87	mg/dL
	15 years up to 999 years, Male	0.70 – 1.20	mg/dL
	15 years up to 999 years, Female	0.50 – 0.90	mg/dL
Creatinine clearance 1054	Male	66 - 163	mL/min/ 1.73m ²
	Female	66 - 165	mL/min/ 1.73m ²
Creatinine, random urine 62	Male	39 – 259	mg/dL
	Female	28 – 217	mg/dL
Creatinine, timed urine 85	Male	12 – 28	mg/kg/ 24hr
	Female	11 - 26	mg/kg/ 24hr

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Cardio CRP C-Reactive Protein, High Sens	5664	Low risk	< 1.0	mg/L
		Avg risk	1.0–3.0	mg/L
		High risk	> 3.0	mg/L
		0 days up to 3 weeks	0.1 – 4.1	mg/L
		3 weeks up to 15 years	0.1 – 2.8	mg/L
Dexamethasone suppression	68	< 5.0	µg/dL	
DHEA-S	285	Male		
		1 week up to 4 weeks	31.6 – 431	µg/dL
		1 month up to 12 months	3.4 – 124	µg/dL
		1 year up to 5 years	0.5 – 19.4	µg/dL
		5 years up to 10 years	2.8 – 85.2	µg/dL
		10 years up to 15 years	24.4 – 247	µg/dL
		15 years up to 20 years	70.2 – 492	µg/dL
		20 years up to 25 years	211 – 492	µg/dL
		25 years up to 35 years	160 – 449	µg/dL
		35 years up to 45 years	88.9 – 427	µg/dL
		45 years up to 55 years	44.3 – 331	µg/dL
		55 years up to 65 years	51.7 – 295	µg/dL
		65 years up to 75 years	33.6 – 249	µg/dL
		75 years up to 999 years	16.2 - 123	µg/dL

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TEST	AGE/SEX	REFERENCE RANGE	UNITS
DHEA-S 285	Female		
	1 week up to 4 weeks	31.6 – 431	µg/dL
	1 month up to 12 months	3.4 – 124	µg/dL
	1 year up to 5 years	0.5 – 19.4	µg/dL
	5 years up to 10 years	2.8 – 85.2	µg/dL
	10 years up to 15 years	33.9 – 280	µg/dL
	15 years up to 20 years	65.1 – 368	µg/dL
	20 years up to 25 years	148 – 407	µg/dL
	25 years up to 35 years	98.8 - 340	µg/dL
	35 years up to 45 years	60.9 – 337	µg/dL
	45 years up to 55 years	35.4 – 256	µg/dL
	55 years up to 65 years	18.9 – 205	µg/dL
	65 years up to 75 years	9.40 – 246	µg/dL
	75 years up to 999 years	12.0 - 154	µg/dL
Digoxin 92		0.8 – 2.0	ng/mL
Ethanol 19		< 0.010	g/dL
Estradiol 288	Male	11.3 – 43.2	pg/mL
	Female		
	Post menopause	< 5 – 138	pg/mL
	Pregnant – 1 st Trimester	154 – 3243	pg/mL
	Pregnant – 2 nd Trimester	1561 – 21280	pg/mL
	Pregnant – 3 rd Trimester	8525 - >30000	pg/mL
			pg/mL
	Follicular	30.9 – 90.4	pg/mL
	Ovulation	60.4 – 533	pg/mL
	Luteal	60.4 – 232	pg/mL

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TEST	AGE/SEX	REFERENCE RANGE	UNITS
Ferritin 102	Male	30 - 400	ng/mL
	Female	15 - 150	ng/mL
Folic Acid 103		4.6 – 34.8	ng/mL
FSH 104 Follicle Stimulating Hormone	Male	1.5 – 12.4	mIU/mL
	Female		
	Follicular	3.5 – 12.5	mIU/mL
	Ovulatory	4.7 – 21.5	mIU/mL
	Luteal	1.7 – 7.7	mIU/mL
	Post-Menopausal	25.8 – 134.8	mIU/mL
Gamma GT 114 Gamma glutamyl transferase	Male	8 – 61	IU/L
	Female	5 – 36	IU/L
Gentamicin, peak 826		5.0 – 8.0	µg/mL
Gentamicin, random 832		None	µg/mL
Gentamicin, trough 827		1.0 – 1.5	µg/mL
Glucose, 1 hr gestational 1078		70 – 139	mg/dL
Glucose, 2 hr post prandial 111		70 – 139	mg/dL
Glucose, CSF 9110	Adult	40 – 70	mg/dL
	Children	60 - 80	mg/dL
Glucose, fasting 109	0 hours up to 28 days	60 - 90	mg/dL
	28 days up to 18 yrs	65 - 99	mg/dL
	18 yrs up to 999 yrs	70 - 99	mg/dL
Glucose, random 7250	0 hours up to 5 hrs	60 - 90	mg/dL
	5 hrs up to 18 yrs	60 - 90	mg/dL
	18 yrs up to 999 yrs	65 - 139	mg/dL
Glucose tolerance, 2 hr 240	Fasting	70 – 99	mg/dL
	2 hour	70 - 139	mg/dL

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TEST	AGE/SEX	REFERENCE RANGE	UNITS
Glucose tolerance, 3 hr gestational 118	Fasting	65 – 94	mg/dL
	1 hour	65 – 179	mg/dL
	2 hour	65 – 154	mg/dL
	3 hour	65 – 139	mg/dL
HCG Beta quant, pregnancy 690	Non-pregnant		
	Pre-menopausal	<5.3	mIU/mL
	Pregnant		
	3 weeks	5.8 – 71.2	mIU/mL
	4 weeks	9.5 – 750	mIU/mL
	5 weeks	217 – 7138	mIU/mL
	6 weeks	158 – 31,795	mIU/mL
	7 weeks	3,697 – 163,563	mIU/mL
	8 weeks	32,065 – 149,571	mIU/mL
	9 weeks	63,803 – 151,410	mIU/mL
	10 weeks	46,509 – 186,977	mIU/mL
	12 weeks	27,832 – 210,612	mIU/mL
	14 weeks	13,950 – 62,530	mIU/mL
	15 weeks	12,039 – 70,971	mIU/mL
	16 weeks	9,040 – 56,451	mIU/mL
	17 weeks	8,175 – 55,868	mIU/mL
	18 weeks	8,099 – 58,176	mIU/mL
HDL cholesterol 3631		>40	mg/dL
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	%

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TEST	AGE/SEX	REFERENCE RANGE	UNITS
Homocysteine, cardiac 4775		<15.0	μmol/L
IgA 1141 Immunoglobulin A	<1 year	0 – 83	mg/dL
	1 – 3 years	20 – 100	mg/dL
	4 – 6 years	27 – 195	mg/dL
	7 – 9 years	34 – 305	mg/dL
	10 – 11 years	53 – 204	mg/dL
	12 – 13 years	58 – 358	mg/dL
	14 – 15 years	47 – 249	mg/dL
	16 – 19 years	61 – 348	mg/dL
	Adult	84.5 – 499	mg/dL
IgG 1140 Immunoglobulin G	0 – 2 years	32.7 – 1270	mg/dL
	2 – 4 years	468 – 1250	mg/dL
	4 – 6 years	532 – 1340	mg/dL
	6 – 8 years	454 – 1360	mg/dL
	8 – 10 years	468 – 1360	mg/dL
	10 – 12 years	468 – 1490	mg/dL
	12 – 14 years	664 – 1490	mg/dL
	14 – 18 years	550 – 1440	mg/dL
	Adult	610.3 – 1616	mg/dL
IgM 143 Immunoglobulin M	Adult	35 – 242	mg/dL
Insulin 141		2.6 – 24.9	μIU/mL
Iron 1144	Female	37 – 145	ug/dl
	Male	61 – 157	ug/dl
Iron binding capacity 100		250 – 400	ug/dl
Iron, % saturation		14 – 50	
Lactic acid, arterial 12603		0.5 – 1.6	mmol/L
Lactic acid, venous 12616		0.5 – 2.0	mmol/L

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TEST				
LDL cholesterol, direct	5665	Reference Range		
		Optimal	<100	mg/dl
		Near Optimal	100 – 129	mg/dl
		Borderline High	130 - 159	mg/dl
		High	160 - 189	mg/dl
		Very High	≥190	mg/dl
	AGE/SEX	REFERENCE RANGE	UNITS	
LD, total Lactate dehydrogenase	909	Male		
		0 up to 30 days	225 - 600	IU/L
		30 days up to 15 years	120 - 300	IU/L
		15 years up to 999 years	135 - 225	IU/L
		Female		
		0 up to 30 days	225 - 600	IU/L
		30 days up to 15 years	120 - 300	IU/L
		15 years up to 999 years	135 - 214	IU/L

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TEST	AGE/SEX	REFERENCE RANGE	UNITS
LH Luteinizing hormone 171	Male	1.7 – 8.6	mIU/mL
	Female		
	Follicular	2.4 – 12.6	mIU/mL
	Ovulatory	14.0 – 95.6	mIU/mL
	Luteal	1.0 – 11.4	mIU/mL
	Post-menopausal	7.7 – 58.5	mIU/mL
Lipase 157		13 – 60	IU/L
Lithium 169		0.6 – 1.2	mEq/L
Magnesium 175	0 days up to 5 months	1.5 – 2.2	mg/dL
	5 months up to 6 years	1.7 – 2.3	mg/dL
	6 years up to 12 years	1.7 – 2.1	mg/dL
	12 years up to 20 years	1.7 – 2.2	mg/dL
	20 years up to 60 years	1.6 – 2.6	mg/dL
	60 years up to 90 years	1.6 – 2.4	mg/dL
	90 years up to 999 years	1.7 – 2.3	mg/dL
Urine albumin/creatinine ratio, 24 hr 634			
Albumin excretion/24 hrs		<30.0	mg/24 hrs
Urine albumin/creatinine ratio, 24 hrs		<30.0	mg/g creat
Urine albumin/creatinine ratio, random 630		<30.0	mg/g creat
Myoglobin, quant 7616	Male	23.0 – 72.0	ng/mL
	Female	19.0 – 51.0	ng/mL
Phenobarbital 207		10.0 – 30.0	µg/mL
Phenytoin, total 91		10.0 – 20.0	µg/mL
Phenytoin, total & free 90	Free	1.0 – 2.5	µg/mL
	Total	10.0 – 20.0	µg/mL

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Phosphorus 205	Male		
	0 days up to 30 days	3.9 – 6.9	mg/dL
	30 days up to 12 months	3.5 – 6.6	mg/dL
	1 year up to 4 years	3.1 – 6.0	mg/dL
	4 years up to 7 years	3.3 – 5.6	mg/dL
	7 years up to 10 years	3.0 – 5.4	mg/dL
	10 years up to 13 years	3.2 – 5.7	mg/dL
	13 years up to 16 years	2.9 – 5.1	mg/dL
	16 years up to 19 years	2.7 – 4.9	mg/dL
	19 years up to 999 years	2.5 – 4.5	mg/dL
	Female		
	0 days up to 30 days	4.3 – 7.7	mg/dL
	30 days up to 12 months	3.7 – 6.5	mg/dL
	1 year up to 4 years	3.4 – 6.0	mg/dL
	4 years up to 7 years	3.2 – 5.5	mg/dL
	7 years up to 10 years	3.1 – 5.5	mg/dL
	10 years up to 13 years	3.3 – 5.3	mg/dL
	13 years up to 16 years	2.8 – 4.8	mg/dL
	16 years up to 19 years	2.5 – 4.8	mg/dL
	19 years up to 999 years	2.5 – 4.5	mg/dL
Phosphorous, timed urine 206		0.4 – 1.3	g/24 Hr
Potassium 211	All ages	3.5 – 5.1	mmol/L
Potassium, timed urine 210		25.0 – 125.0	mmol/24 hr
Prealbumin 2455		18.0 – 38.0	mg/dL
Pro BNP 7095	0 days – 75 years	< 125	pg/ml
	75 years – 999 years	< 450	pg/ml

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Progesterone 257	Male	< 0.1 – 0.2	ng/mL
	Non pregnant Female		
	Follicular	< 0.1 – 0.2	ng/mL
	Ovulation	0.1 – 4.1	ng/mL
	Luteal	4.1 – 14.5	ng/mL
	Post Menopause	< 0.1 – 0.1	ng/mL
	Pregnant Female		
	1 st trimester	11.0 – 44.3	ng/mL
	2 nd trimester	25.4 – 83.4	ng/mL
	3 rd trimester	58.7 – 214	ng/mL
Prolactin 215	Male	4.04 - 15.2	ng/mL
	Female	4.79 - 23.3	ng/mL
Protein/creatinine ratio, urine 2805		<0.2	None
Protein quant, random urine 1184		1 – 14	mg/dL
Protein, timed urine 361		< 150	mg/24 hr
Protein, total 219	0 days up to 7 days	4.4 – 7.6	g/dL
	7 days up to 1 year	5.1 – 7.3	g/dL
	1 year up to 2 years	5.6 – 7.5	g/dL
	2 years up to 999 years	6.0 – 8.0	g/dL
Globulin	All ages	2.0 – 3.7	g/dL
Protein, total, CSF 220		15 – 45	mg/dL
PSA, free 3166	Probability of finding PCA on needle biopsy		
	% free PSA ratio	age 50 - 59	age 60 - 69
	0 - 10.0	49.2	57.5
	11 - 18.0	26.9	33.9
	19 - 25.0	18.3	23.9
	> 25	9.1	12.2
			Age >= 70
			64.5
			40.8
			29.7
			15.8
PSA, total, diagnostic 1097		<4.00	ng/mL
PSA, total, screen 1102		<4.00	ng/mL

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Salicylate 228		15.0 – 30.0	mg/dL
Sodium 233		136 - 145	mmol/L
Sodium, timed urine 234		40 – 220	mmol/24 hr
Sol transferrin receptor 6330	Male	2.2 – 5.0	mg/L
	Female	1.9 – 4.4	mg/L
T3, free 388	Adult (>19 years)	2.0 – 4.4	pg/mL
	0 days up to 30 days	2.0 – 5.2	pg/mL
	30 days up to 1 year	1.5 – 6.4	pg/mL
	1 year up to 7 years	2.0 – 6.0	pg/mL
	7 years up to 12 years	2.7 – 5.2	pg/mL
	12 years up to 19 years	2.3 – 5.0	pg/mL
T3, total 845		85 – 202	ng/dL
T4, total (Thyroxine) 847		4.5 – 11.7	µg/dL
T4, free (Free Thyroxine) 251		0.93 – 1.70	ng/dL
Testosterone, total 44	Male		
	20 years up to 50 years	249 – 836	ng/dL
	50 years up to 999 years	193 - 740	ng/dL
	Female		
	20 years up to 50 years	8.40 – 48.1	ng/dL
	50 years up to 999 years	2.90 – 40.8	ng/dL
Tobramycin, peak 849		6.0 – 10.0	µg/mL
Tobramycin, trough 829		< 1.5	µg/mL
Triglyceride 256		< 150	mg/dL

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Troponin T (hs) 14932 14933	Male	6 - 15	ng/L
	Female	6 - 10	ng/L
TSH 258		0.27 – 4.20	µIU/mL
Urea nitrogen, timed urine 264		12 - 20	g/24 hr
Uric acid 262	Male	3.4 – 7.0	mg/dL
	Female	2.4 – 5.7	mg/dL
Uric acid, rasburicase 8290	Male	3.4 – 7.0	mg/dL
	Female	2.4 – 5.7	mg/dL
Uric acid, timed urine 263		200 - 1000	mg/24 hr
Valproic acid, total 949		50.0 – 100.0	µg/mL
Valproic acid, free 6359		6.0 – 20.0	µg/mL
Vancomycin, peak 964		35.0 – 45.0	µg/mL
Vancomycin, trough 963		7.0 – 20.0	µg/mL
Vitamin B12 272		232 - 1245	pg/mL
Vitamin D 25 (Deficiency) 113A		20.0 – 80.0	ng/mL