ENDOCRINOLOGY EXPECTED VALUES *& S.I. Unit Conversion Tables*

DISCLAIMER:
This data applies to the highly sensitive and specific assay methods developed, validated, and performed solely at Endocrine Sciences.

ENDOCRINOLOGY EXPECTED VALUES AND S.I. UNIT CONVERSION TABLES

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(E) = Esoterix Test Number

(L) = LabCorp Test Number

Esoterix is a wholly owned subsidiary of LabCorp where its Endocrine Sciences laboratory operates as a Center of Excellence for specialized endocrinology. Endocrine Sciences' testing can be accessed directly from Esoterix or through LabCorp and any of its regional facilities.

INTRODUCTION

As a specialized laboratory, Endocrine Sciences recognizes the need for comprehensive reference values for hormone tests. In response to this need, we maintain an active program to determine hormone levels in healthy individuals at all ages and over a broad range of physiologic conditions. The value of this information is appreciated by physicians, who because of the nature of endocrine disease, rely extensively on laboratory results for diagnosis.

Diagnostic problems in pediatric endocrinology are further complicated by dramatic changes in hormone levels which occur during the neonatal and prepubertal periods, at adrenarche, and during pubertal development. Comprehensive reference values are indispensable to the assessment of hormonal dysfunction in children. Since its founding in 1972, Endocrine Sciences has maintained a continuous program to obtain reference intervals in children.

Through collaborative studies conducted with pediatricians, hospitals and university research centers, we have obtained comprehensive pediatric values for the majority of our tests. The information accumulated over the past several years is published herein to facilitate the interpretation of endocrine test results on pediatric patients. Endocrine Sciences would like to express its gratitude to the many clinicians and researchers who have participated in our program and generously contributed their time and patient samples.

The difficult nature of certain studies has limited the ability to collect all of the necessary data through this program, therefore some values included here are from research publications. This outside data is included only after extensive review and careful examination to insure that methods demonstrated adequate specificity and that values were comparable to those determined at Endocrine Sciences. Determining reference values for hormone tests is an on-going program. We will continue to collect data on current assays and establish reference values for new tests. We cordially invite interested physicians to join us in this continuing project.

Acid Labile Subunit (ALS)

BLOOD ASSAYS

500012 (E) **500120 (L)**

	Range (mg/L)	Mean
INFANTS		
0 – 2 Months:	0.2 – 5.1	2.1
3 – 6 Months:	0.7 – 5.6	3.4
7 – 11 Months:	0.7 – 7.9	4.0
PREPUBERTAL		
1 – 2 Years:	0.9 – 9.3	5.5
3 – 4 Years:	1.9 – 10	6.8
5 – 7 Years:	2.3 – 11	7.2
8 – 10 Years:	4.2 – 13	8.9
PUBERTAL		
11 – 13 Years:	5.6 – 16	12
14 – 18 Years:	5.6 – 16	12
ADULTS		
19 – 25 Years:	7.0 – 16	12
26 – 35 Years:	7.0 – 16	12
36 – 45 Years:	7.0 – 16	11
46 – 55 Years:	7.0 – 16	11
56 – 65 Years:	7.0 – 16	10

Expected values apply to assays performed at Endocrine Sciences only.

Aldosterone

BLOOD ASSAYS

500014 (E) **500467 (L)**

Ad Lib Sodium Intake	SUPINE (ng/dL)	UPRIGHT (ng/dL)
PREMATURE INFANTS		
26 – 28 Weeks, Day 4:	5 – 635	not applicable
31 – 35 Weeks, Day 4:	19 – 141	not applicable
FULL-TERM INFANTS		
3 Days:	7 – 184	not applicable
7 Days:	5 – 175	not applicable
1 – 11 Months:	5 – 90	not applicable
CHILDREN		
12 – 23 Months:	7 – 54	not applicable
24 Months – 9 Years:	3 – 35	5 – 80
10 – 14 Years:	2 – 22	4 – 48
ADULTS	3 – 16	7 – 30

Values are based on early morning samples from subjects on ad lib sodium intake. Diurnal variations and values in pediatric patients on different sodium diets are currently unavailable.

Adrenocorticotropic Hormone (ACTH)

BLOOD ASSAYS

500011 (E) **500471 (L)**

ADULTS

Range

6 – 48 pg/mL

Aldosterone, Urine (Includes Creatinine)

URINE ASSAYS

500018 (E) **500760 (L)**

	RANGE (ug/24 hours)	RANGE (ug/g creatinine)
Ad Lib Sodium Intake		
NEWBORN		
1 – 3 Days:	0.5 – 5	20 – 140
PREPUBERTAL CHILDREN		
4 – 10 Years:	1 – 8	4 – 22
ADULTS		
Low Sodium Intake:	20 – 80	Not determined
Normal Sodium:	3 – 19	1.5 – 20
High Sodium:	2 – 12	Not determined

Aldosterone excretion rates in infants and children on high and low sodium intake are not available. Aldosterone excretion rates in newborns correlate highly with potassium: sodium ratios but not with sodium intake.

Alpha Subunit

BLOOD ASSAYS

500016 (E) **140269 (L)**

	RANGE (ng/mL)
ADULT	
Males:	
< 50 Years:	0.05 – 0.53
>/= 50 Years:	0.09 – 0.76
Females:	
Premenopausal:	0.04 – 0.38
Postmenopausal:	0.09 – 1.23

Androstanediol Glucuronide

BLOOD ASSAYS

500026 (E) **500881 (L)**

	RANGE (ng/dL)
PREPUBERTAL CHILDREN	
0 – 10 Years:	< 5 – 42
ADULTS	
Males:	190 – 900
Females*:	35 – 200

*Occasionally, normal females with no evidence of hirsutism may have levels well above the normal range.

Androstenedione, HPLC-MS/MS

BLOOD ASSAYS

500030 (E) **500152 (L)**

RANGE (ng/dL)

PREMATURE INFANTS

26 – 28 Weeks, Day 4: 63 – 935
31 – 35 Weeks, Day 4: 50 – 449

FULL–TERM INFANTS

1 – 7 Days: <10 – 279
Levels decrease rapidly to a range of <52 ng/dL after one week.

1 – 11 Months: <10 – 37
Androstenedione gradually decreases during the first six months to prepubertal levels.

PREPUBERTAL CHILDREN

1 – 10 Years: <10 – 17

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	<10 – 17	<10	1	< 9.2	<10 – 17	<10
2	9.8 – 14.5	<10 – 33	12	2	9.2 – 13.7	<10 – 72	33
3	10.7 – 15.4	17 – 72	36	3	10.0 – 14.4	50 – 170	97
4	11.8 – 16.2	15 – 115	52	4	10.7 – 15.6	47 – 208	105
5	12.8 – 17.3	33 – 192	77	5	11.8 – 18.6	50 – 224	137

	RANGE (ng/dL)	RANGE (ng/dL)
ADULTS	MALE	FEMALE (entire cycle)
18 – 40 Years:	44 – 186	28 – 230
Postmenopausal:		<10 – 93

Antidiuretic Hormone (ADH) *RUO*

BLOOD ASSAYS

500035 (E) **500846 (L)**

	RANGE (pg/mL)
ADULTS	0.7 – 3.8
With normal serum osmolality	

Anti-Mullerian Hormone (AMH), Serum *RUO*

BLOOD ASSAYS

500043 (E) **500183 (L)**

	RANGE (ng/mL)
MALES	
0 – 13 Days:	15.5 – 48.7
14 Days -11 Months:	39.1 – 91.1
12 Months – 6 Years:	48.0 – 83.2
7 – 8 Years:	33.8 – 60.2
Adult:	3.0 – 5.4
FEMALES	
0 – 8 Years:	0.0 – 7.1
Adult:	0.0 – 6.9

Bone Specific Alkaline Phosphatase, Serum

BLOOD ASSAYS

500074 (E) **500602 (L)**

	RANGE (u/L)
MALES	<20.2
FEMALES	
Premenopausal:	<=14.3
Postmenopausal:	<=22.4

Calcitonin

BLOOD ASSAYS

500047 (E) **500636 (L)**

	RANGE (pg/mL)
MALES	
0 – 150y:	< 8.4
FEMALES	
0 – 150y:	< 5.0

Catecholamines, Fractionated, Plasma

BLOOD ASSAYS

500052 (E) **500883 (L)**

	NOREPINEPHRINE RANGE (pg/mL)	EPINEPHRINE RANGE (pg/mL)
NEWBORN		
1 – 7 Days:	200 – 420	20 – 130
CHILDREN		
1 – 16 Years:		
Basal:	150 – 400	20 – 115
ADULTS		
20 – 55 Years:		
Basal:	125 – 310	20 – 97
Standing:	167 – 515	20 – 109
55 – 64 Years:		
Basal:	130 – 455	20 – 97
Standing:	210 – 915	20 – 109
65 – 74 Years		
Basal:	165 – 700	20 – 97
Standing:	300 – 1140	20 – 109

Values were obtained from samples collected under optimal, basal conditions whenever possible. Catecholamine levels are elevated by many variables, including the stress of venipuncture and by numerous pharmacological agents.

Catecholamines, Fractionated, Urine

URINE ASSAYS

500062 (E) **500520 (L)**

	RANGE (ug/24 hours)	RANGE (ug/g creatinine)
NOREPINEPHRINE		
INFANTS		
< 1 Year:	Not Determined	37 – 195
CHILDREN		
1 – 10 Years:	Not Determined	24 – 140
OLDER CHILDREN AND ADULTS	16 – 125	12 – 110
EPINEPHRINE		
INFANTS		
< 1 Year:	Not Determined	2 – 180
CHILDREN		
1 – 10 Years:	Not Determined	20 – 149
OLDER CHILDREN AND ADULTS	3 – 38	9 – 25

Pediatric values were determined on both random and 8 hour urine collections.

Catecholamines, Total, Urine (Includes Creatinine)

URINE ASSAYS

500060 (E) **500473 (L)**

	RANGE (ug/24 hours)	RANGE (ug/g creatinine)
INFANTS		
< 1 Year:	Not Determined	34 – 286
CHILDREN		
1 – 10 Years:	Not Determined	16 – 255
OLDER CHILDREN AND ADULTS	30 – 118	22 – 115

Corticosteroid Binding Globulin (CBG)

BLOOD ASSAYS

500076 (E) **500130 (L)**

	RANGE (mg/dL)
NEWBORN	
0 – 3 Weeks:	1.6 – 2.5
INFANTS	
4 Weeks – 11 Months:	2.2 – 8.3
FEMALES	
12 Months – 8 Years	4.3 – 10
MALES	
12 Months – 9 Years	4.3 – 10
OLDER CHILDREN AND ADULTS	2.3 – 3.9
ESTROGEN THERAPY AND PREGNANCY	> 6.0

Corticosterone, HPLC-MS/MS

BLOOD ASSAYS

500084 (E) **500135 (L)**

	RANGE (ng/dL)	RANGE (ng/dL)
PREMATURE INFANTS		
26 – 28 Weeks, Day 4:	235 – 1108	
31 – 35 Weeks, Day 4:	150 – 1700	
NEWBORN		
1 – 7 Days:	70 – 850	
30 Days – 11 Months:	80 – 1500	
CHILDREN	**8:00 a.m.**	**4:00 p.m.**
1 – 16 Years:	135 – 1860	70 – 620
ADULTS	130 – 820	60 – 220

Cortisol, Free, Urine (Incl. Creatinine), HPLC-MS/MS

URINE ASSAYS

500102 (E) **500410 (L)**

	RANGE (ug/24 hours)	RANGE (ug/g creatinine)
PREPUBERTAL CHILDREN	3 – 9	7 – 25
ADULT MALE	11 – 84	7 – 45
ADULT FEMALE	10 – 34	9 – 32
PREGNANCY	16 – 60	14 – 59

Cortisol, Saliva, HPLC-MS/MS

SALIVA ASSAYS

500094 (E) **500179 (L)**

	RANGE (ug/dL)
CHILDREN and ADULTS	
8:00 a.m.	0.025 – 0.600
Noon	<0.010 – 0.330
4:00 p.m.	0.010 – 0.200
Midnight	<0.010 – 0.090

Cortisol, Serum, HPLC-MS/MS

BLOOD ASSAYS

500092 (E) **500154 (L)**

	RANGE (ug/dL)	
PREMATURE INFANTS		
26 – 28 Weeks, Day 4:	1 – 11	
31 – 35 Weeks, Day 4:	2.5 – 9.1	
FULL–TERM INFANTS		
Day 3:	1.7 – 14	
Day 7:	2.0 – 11	
31 Days – 11 Months:	2.8 – 23	
CHILDREN	**8:00 a.m.**	**4:00 p.m.**
12 Month – 15 Years:	3.0 – 21	
ADULTS	8.0 – 19	4.0 – 11

C-Peptide, Plasma

BLOOD ASSAYS

500104 (E) **500642 (L)**

	RANGE (ng/mL)
CHILDREN	
8:00 a.m. Fasting:	0.4 – 2.2
ADULTS	
8:00 a.m. Fasting:	0.4 – 2.1
2 Hours Post Prandial (Sustacal):	1.2 – 3.4
2 Hours Post Glucose:	2.0 – 4.5

Dehydroepiandrosterone (DHEA)

BLOOD ASSAYS

500116 (E) **500156 (L)**

	RANGE (ng/dL)	
PREMATURE INFANTS		
26 – 28 Weeks, Day 4:	236 – 3640	
31 – 35 Weeks, Day 4:	80 – 3150	
FULL–TERM INFANTS		
3 Days:	65 – 1250	
8 – 30 Days:	50 – 760	
31 Days – 5 Months:	26 – 385	
6 – 11 Months:	20 – 100	
PREPUBERTAL CHILDREN		
12 Months – 5 Years:	20 – 130	
6 – 7 Years:	20 – 275	Values begin to increase progressively at about six years of age prior to any physical evidence of puberty.
8 – 10 Years:	31 – 345	

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	31 – 345	156	1	< 9.2	31 – 345	156
2	9.8 – 14.5	110 – 495	300	2	9.2 – 13.7	150 – 570	330
3	10.7 – 15.4	170 – 585	390	3	10.0 – 14.4	200 – 600	385
4	11.8 – 16.2	160 – 640	395	4	10.7 – 15.6	200 – 780	430
5	12.8 – 17.3	250 – 900	505	5	11.8 – 18.6	215 – 850	540

ADULTS

20 – 50 Years: 160 – 800

Dehydroepiandrosterone Sulfate (DHEA-S)

BLOOD ASSAYS

500120 (E) **500161 (L)**

	RANGE (ug/dL)
PREMATURE INFANTS	
26 – 28 Weeks, Day 4:	123 – 882
31 – 35 Weeks, Day 4:	122 – 710
FULL–TERM INFANTS	
3 Days:	88 – 356
1 – 11 Months:	5 – 111 ug/dL by first month, 5 – 48 ug/dL by 6 months.
PREPUBERTAL	
1 – 5 Years:	< 5 – 57
CHILDREN	
6 – 7 Years:	9 – 72
8 – 10 Years:	13 – 115

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ug/dL)	MEAN (ug/dL)	TANNER STAGE	AGE (years)	RANGE (ug/dL)	MEAN (ug/dL)
MALE				FEMALE			
1	< 9.8	13 – 83	36	1	< 9.2	19 – 144	40
2	9.8 – 14.5	42 – 109	93	2	9.2 – 13.7	34 – 129	72
3	10.7 – 15.4	48 – 200	122	3	10.0 – 14.4	32 – 226	88
4	11.8 – 16.2	102 – 385	206	4	10.7 – 15.6	58 – 260	120
5	12.8 – 17.3	120 – 370	230	5	11.8 – 18.6	44 – 248	148

ADULTS	MALE RANGE (ug/dL)	FEMALE RANGE (ug/dL)
21 – 30 Years:	100 – 460	76 – 255
31 – 40 Years:	88 – 305	48 – 247
41 – 50 Years:	70 – 218	19 – 210
51 – 60 Years:	29 – 220	20 – 157
61 – 70 Years:	26 – 213	10 – 115
71 – 80 Years:	20 – 172	not determined

Deoxycorticosterone (DOC), HPLC-MS/MS

BLOOD ASSAYS

500124 (E) **500138 (L)**

	RANGE (ng/dL)
PREMATURE INFANTS	
26 – 28 Weeks, Day 4:	20 – 105
34 – 36 Weeks, Day 4:	28 – 78
NEWBORN	
	Levels are markedly elevated at birth and decrease rapidly during the first week to the range of 7-49 as found in older infants.
FULL–TERM INFANTS	
1 – 11 Months:	7 – 49
PREPUBERTAL CHILDREN	
2 – 10 Years:	2 – 34
PUBERTAL CHILDREN AND ADULTS	
8:00 a.m.:	2 – 19

Deoxypyridinolines, Urine (Includes Creatinine)

URINE ASSAYS

500127 (E) **500211 (L)**

	RANGE
ADULTS	
Males:	up to 5.4 nmole/mmole creatinine
Females:	
Premenopausal:	up to 7.4 nmole/mmole creatinine
Postmenopausal:	up to 8.5 nmole/mmole creatinine

Results higher than the above ranges indicate an accelerated bone resorption rate.

Desoxycortisol, 11-, (Compound S for Metyrapone Test)

BLOOD ASSAYS

500136 (E) **500550 (L)**

	RANGE (ug/dL)
CHILDREN AND ADULTS	
Baseline:	< 1
Post Metyrapone:	
Single Dose Test:	7 – 18
Multiple Dose Test:	10 – 25

Desoxycortisol, 11-, (Specific Compound S), HPLC-MS/MS BLOOD ASSAYS

500132 (E) **500171 (L)**

	RANGE (ng/dL)
PREMATURE INFANTS	
26 – 28 Weeks, Day 4:	110 – 1376
31 – 35 Weeks, Day 4:	48 – 579
FULL–TERM INFANTS	
3 Days:	13 – 147
31 Days – 11 Months:	< 10 – 156
PREPUBERTAL CHILDREN	
8:00 a.m.:	20 – 155
PUBERTAL CHILDREN AND ADULTS	
8:00 a.m.:	12 – 158

Dexamethasone, HPLC-MS/MS

BLOOD ASSAYS

500140 (E) **500118 (L)**

	RANGE (ng/dL)
ADULTS	
Baseline:	< 30
8:00 a.m.: Following 1 mg Dexamethasone, Previous Evening	140 – 295
8:00 a.m.: Following 8 mg Dexamethasone, (4 x 2 mg Doses) Previous Day	1600 – 2850

Dihydrotestosterone (DHT), HPLC-MS/MS

BLOOD ASSAYS

500144 (E) **500142 (L)**

	MALE RANGE (ng/dL)	FEMALE RANGE (ng/dL)
PREMATURE INFANTS	10 – 53	2 – 13
FULL–TERM NEWBORNS	5 – 60	< 2 – 15

RANGE (ng/dL)

FULL–TERM NEWBORNS

2 Weeks – 6 Months:

Male: DHT decreases rapidly the first week, then increases to 12–85 ng/dL between 30–60 days. Levels then decrease gradually to prepubertal values by seven months.

Female: Levels decrease during the first month to < 3 ng/dL and remain there until puberty.

PREPUBERTAL CHILDREN < 3

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	< 3		1	< 9.2	< 3	
2	9.8 – 14.5	3 – 17	8	2	9.2 – 13.7	5 – 12	8
3	10.7 – 15.4	8 – 33	19	3	10.0 – 14.4	7 – 19	12
4	11.8 – 16.2	22 – 52	36	4	10.7 – 15.6	4 – 13	7
5	12.8 – 17.3	24 – 65	43	5	11.8 – 18.6	3 – 18	9

RANGE (ng/dL)

ADULTS

Male: 30 – 85

Female: 4 – 22

Estradiol, HPLC-MS/MS

BLOOD ASSAYS

500152 (E) **500108 (L)**

RANGE (ng/dL)

NEWBORN Levels are markedly elevated at birth and fall rapidly during the first week to prepubertal values of < 1.5 ng/dL.

1 – 6 Months:
Male: Levels increase to 1.0 – 3.2 ng/dL between 30 and 60 days, then decline to prepubertal levels of < 1.5 ng/dL by six months.

1 – 11 Months:
Female: Levels increase to 0.5 – 5.0 ng/dL between 30 and 60 days, then decline to prepubertal levels of < 1.5 ng/dL during the first year.

PREPUBERTAL CHILDREN

1 – 10 Years: < 1.5 ng/dL

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	0.5 – 1.1	0.8	1	< 9.2	0.5 – 2.0	0.8
2	9.8 – 14.5	0.5 – 1.6	1.1	2	9.2 – 13.7	1.0 – 2.4	1.6
3	10.7 – 15.4	0.5 – 2.5	1.6	3	10.0 – 14.4	0.7 – 6.0	2.5
4	11.8 – 16.2	1.0 – 3.6	2.2	4	10.7 – 15.6	2.1 – 8.5	4.7
5	12.8 – 17.3	1.0 – 3.6	2.1	5	11.8 – 18.6	3.4 – 17	11

ADULTS

Male: 0.8 – 3.5 ng/dL

Female:
Follicular: 3 – 10 ng/dL
Luteal: 7 – 30 ng/dL
Postmenopausal: < 1.5 ng/dL

Estrogens, Total

BLOOD ASSAYS

500148 (E) **500714 (L)**

RANGE (ng/dL)

FULL–TERM INFANTS

Newborn: Markedly elevated at birth and fall rapidly during the first week to < 2.5 by seven days.

30 Days – 11 Months:

Male: Levels increase to 1.0 – 4.0 between 30 – 60 days then decline to < 2.5 by 12 months

Female: Levels increase to 1.0 – 6.0 between 30 – 60 days then decline to < 2.5 by 12 months

PREPUBERTAL CHILDREN

1 – 10 Years: < 2.5 ng/dL

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	1.0 – 3.8	2.0	1	< 9.2	1.0 – 4.6	2.3
2	9.8 – 14.5	1.7 – 4.5	3.0	2	9.2 – 13.7	2.2 – 6.3	4.1
3	10.7 – 15.4	2.2 – 5.5	4.1	3	10.0 – 14.4	2.4 – 11	6.1
4	11.8 – 16.2	2.7 – 8.0	5.3	4	10.7 – 15.6	4 – 18	9.1
5	12.8 – 17.3	2.5 – 8.0	5.0	5	11.8 – 18.6	6 – 28	17

ADULTS

Male: 2 – 8 ng/dL

Female:

Follicular: 6 – 20 ng/dL

Luteal: 16 – 40 ng/dL

Postmenopausal: < 5 ng/dL

Note: Esoterix' assay is specific for estrone and estradiol, and does not measure estriol.

Estrone, HPLC-MS/MS

BLOOD ASSAYS

500172 (E) **500634 (L)**

RANGE (ng/dL)

NEWBORN

Values are strikingly elevated at birth, then decrease rapidly during the first week to prepubertal levels of < 1.5.

PREPUBERTAL CHILDREN

1 – 10 Years: < 1.5 ng/dL

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	0.5 – 1.7	1.1	1	< 9.2	0.4 – 2.9	1.3
2	9.8 – 14.5	1.0 – 2.5	1.6	2	9.2 – 13.7	1.0 – 3.3	2.1
3	10.7 – 15.4	1.5 – 2.5	2.1	3	10.0 – 14.4	1.5 – 4.3	3.0
4	11.8 – 16.2	1.5 – 4.5	3.3	4	10.7 – 15.6	1.6 – 7.7	3.6
5	12.8 – 17.3	2.0 – 4.5	3.2	5	11.8 – 18.6	2.9 – 10.5	6.1

ADULTS

Male: 1.0 – 5.0 ng/dL

Female:
Follicular: 3.0 – 10 ng/dL
Luteal: 9.0 – 16 ng/dL

Postmenopausal: < 4.0 ng/dL

Follicle Stimulating Hormone (FSH) ECL

BLOOD ASSAYS

500192 (E) *(Expressed in terms of W.H.O. International Standard, Human Pituitary FSH 83/575)* **502280 (L)**

RANGE (mIU/mL)

INFANTS

4 Weeks – 11 Months:

Male: 0.16 – 4.1
Levels are for infants from 4 weeks of age to one year. FSH in males declines to prepubertal levels by the end of the first year.

Female: 0.24 – 14.2
Levels are for infants from 4 weeks of age to one year. FSH declines more slowly than in males to reach prepubertal levels by the end of the second year.

PREPUBERTAL CHILDREN

	MALE	FEMALE
12 Months – 8 Years:	0.26 – 3.0	1.0 – 4.2

PUBERTY

TANNER STAGE	AGE (years)	RANGE (mIU/mL)	MEAN (mIU/mL)	TANNER STAGE	AGE (years)	RANGE (mIU/mL)	MEAN (mIU/mL)
MALE				FEMALE			
1	< 9.8	0.26 – 3.0	0.98	1	< 9.2	1.0 – 4.2	2.1
2	9.8 – 14.5	1.8 – 3.2	2.5	2	9.2 – 13.7	1.0 – 10.8	4.0
3	10.7 – 15.4	1.2 – 5.8	2.9	3	10.0 – 14.4	1.5 – 12.8	5.1
4	11.8 – 16.2	2.0 – 9.2	4.4	4	10.7 – 15.6	1.5 – 11.7	6.4
5	12.8 – 17.3	2.6 – 11.0	6.1	5	11.8 – 18.6	1.0 – 9.2	4.9

ADULT

Males 20 – 50 Years: 2.0 – 9.2

Females

Follicular & Luteal: 1.8 – 11.2

Mid–cycle: 6 – 35

Post Menopausal: 30 – 120

Glutamic Acid Decarboxylase (GAD-65) Autoantibodies

BLOOD ASSAYS

500236 (E) **500611 (L)**

	RANGE
ALL AGES	< 0.5 U/mL

GlycoMark

BLOOD ASSAYS

500609 (E) **500115 (L)**

RANGES	REFERENCE INTERVAL (ug/mL) 1, 5AG	MEAN (SD) (ug/mL) 1, 5AG
MALES	10.7 – 32.0	22.5 (5.8)
FEMALES	6.8 – 29.3	17.7 (6.2)

Growth Hormone Antibodies

BLOOD ASSAYS

500214 (E) **500144 (L)**

	RANGE
ALL AGES	Negative

Growth Hormone Binding Protein (GHBP)

BLOOD ASSAYS

500209 (E) **500177 (L)**

	RANGE (pmol/L)
CHILDREN	
Under 2 Years:	<125 – 762
2 – 9 Years:	267 – 1638
10 – 14 Years:	431 – 1892
ADULTS	
20 – 50 Years:	686 – 2019
LARON DWARFISM	< 125

Growth Hormone, ICMA

BLOOD ASSAYS

500213 (E) **500647 (L)**

	RANGE
ALL AGES	0 – 6 ng/mL

NOTE: GH is secreted episodically. An individual may have levels ranging from undetectable to elevated over the course of a day.

RESPONSE TESTING (CHILDREN AND ADULTS):
GH response to provocative stimuli among normal individuals is highly variable. Response values greater than 6 ng/mL using two-site assays have historically been considered to reflect normal GH secretory function, while values below 6 ng/mL have been considered to indicate some degree of GH deficiency. However, it should be noted that this limit is arbitrarily derived. A significant percentage of normal controls exhibit response values well below this 6 ng/mL limit. The clinical research literature should be consulted for a more recent detailed review of the interpretation of GH response data.

Growth Hormone, RIA

BLOOD ASSAYS

500212 (E) **500632 (L)**

	RANGE (ng/mL)
NEWBORN	
1 Day:	5 – 53
2 – 7 Days:	5 – 27
31 Days – 11 Months:	2 – 10

Following an 8 – 12 hour overnight fast:

CHILDREN	0 – 6
ADULTS	0 – 6

RESPONSE TESTING (CHILDREN AND ADULTS):
The assessment of GH secretory capacity is complicated because of the episodic nature of GH release from the pituitary. Basal GH levels can exhibit considerable variability throughout a 24-hour period, thus limiting their clinical utility. Alternatively, measurement of GH response to various stimuli has commonly been used to improve the diagnostic assessment of GH secretion. GH response to provocative stimuli among normal individuals, however, is highly variable. Response values greater than 10 ng/mL have historically been considered to reflect normal GH secretory function, while values below 10 ng/mL have been considered to indicate some degree of GH deficiency. However, it should be noted that this limit is arbitrarily derived. A significant percentage of normal controls exhibit response values well below this 10 ng/mL limit. The clinical research literature should be consulted for a more recent detailed review of the interpretation of GH response data.

Growth Hormone, Urine (Includes Creatinine)

URINE ASSAYS

500211 (E) **500330 (L)**

	RANGE (ng/g creatinine)
Overnight Collection	
PREPUBERTAL CHILDREN	
1 – 8 Years	7.5 – 42
PUBERTAL CHILDREN	
9 – 18 Years	6.7 – 39
ADULTS	
19 – 43 Years	0.2 – 14.8
24 hr Collection	
PREPUBERTAL CHILDREN	
1 – 8 Years	10.2 – 30.1
PUBERTAL CHILDREN	
9 – 18 Years	9.3 – 29
ADULTS	
19 – 43 Years	0.2 – 13

Hemoglobin A1c

BLOOD ASSAYS

502080 (E) **501270 (L)**

	RANGE
ADULTS	4.2% – 5.9%

Hydroxycorticosteroids, 17, Urine (Includes Creatinine)

URINE ASSAYS

500216 (E) **500852 (L)**

Glenn–Nelson Procedure

	RANGE (mg/24 hours)	RANGE (mg/g creatinine)
PREPUBERTAL CHILDREN		
1 – 4 Years:	0.2 – 2.5	1.7 – 6.4
5 – 9 Years:	0.5 – 2.5	2.2 – 6.0
PUBERTAL CHILDREN AND ADULTS		
Male:	3 – 10	2.4 – 4.3
Female:	2 – 6	1.6 – 3.6

Hydroxycorticosterone, 18, HPLC-MS/MS

BLOOD ASSAYS

500088 (E) **500778 (L)**

	18–OH–Corticosterone RANGE (ng/dL)	18–OH–Corticosterone/ Aldosterone Ratio RANGE (ng/dL)
PREMATURE INFANTS		
26 – 28 Weeks, Day 4:	10 – 670	1.0 – 4.5
31 – 35 Weeks, Day 4:	57 – 410	1.1 – 5.2
FULL–TERM INFANTS		
3 Days:	31 – 546	2.6 – 5.3
31 Days – 11 Months:	5 – 220	2.3 – 6.0
CHILDREN		
12 – 23 Months:	18 – 155	1.7 – 5.0
24 Months – 9 Years:	6 – 85	2.4 – 10.5
10 – 14 Years:	10 – 72	2.0 – 8.3
ADULTS		
	9 – 58	1.7 – 8.8
8:00 a.m. Supine:	4 – 21	
8:00 a.m. Upright:	5 – 46	

Samples were collected without regard to posture from subjects on *ad lib* sodium intake. For additional information on the effects of posture and sodium intake, contact the laboratory.

Hydroxyindoleacetic Acid, 5- (5-HIAA), Urine (Includes Creatinine)

URINE ASSAYS

500215 (E) **500720 (L)**

	RANGE(mg/24 hour)
ADULTS	< 16.0

Hydroxypregnenolone, 17-, HPLC-MS/MS

BLOOD ASSAYS

500262 (E) **140715 (L)**

	RANGE (ng/dL)
PREMATURE INFANTS	
26 – 28 Weeks, Day 4:	375 – 3559
31 – 35 Weeks, Day 4:	64 – 2380
FULL–TERM INFANTS	
3 Days:	10 – 829
1 – 5 Months:	36 – 763
6 – 11 Months:	42 – 540
PREPUBERTAL CHILDREN	
12 – 23 Months:	14 – 207
24 Months – 5 Years:	10 – 103
6 – 9 Years:	10 – 186
PUBERTAL AGE GROUPS	44 – 235
ADULTS	53 – 357

Hydroxyprogesterone, 17a-, (17-OHP), HPLC-MS/MS

BLOOD ASSAYS

500270 (E) **500163 (L)**

RANGE (ng/dL)

PREMATURE INFANTS

26 – 28 Weeks, Day 4: 124 – 841
31 – 35 Weeks, Day 4: 26 – 568

FULL–TERM INFANTS

3 Days: 7 – 77
Male 1 – 11 Months: Levels increase after the first week to peak values ranging from 40 – 200 ng/dl between 30 and 60 days. Values then decline to prepubertal range of 3 – 90 before one year.

Female 1 – 11 Months : 13 – 106

PREPUBERTAL CHILDREN

1 – 10 Years: 3 – 90

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	3 – 90	38	1	< 9.2	3 – 82	31
2	9.8 – 14.5	5 – 115	51	2	9.2 – 13.7	11 – 98	49
3	10.7 – 15.4	10 – 138	57	3	10.0 – 14.4	11 – 155	70
4	11.8 – 16.2	29 – 180	80	4	10.7 – 15.6	18 – 230	91
5	12.8 – 17.3	24 – 175	97	5	11.8 – 18.6	20 – 265	108

ADULTS	MALE RANGE (ng/dL)	FEMALE RANGE (ng/dL)
	27 – 199	Follicular: 15 – 70 Luteal: 35 – 290

ICA-512 Autoantibodies

BLOOD ASSAYS

500255 (E) **141531 (L)**

	RANGE
ALL AGES	< 1.0 U/mL

IGF Binding Protein-1 (IGFBP-1)

BLOOD ASSAYS

500283 (E) **140822 (L)**

	RANGE (ng/mL)
PREPUBERTAL CHILDREN	
Fasting:	30 – 1000
Random:	10 – 500
PUBERTAL CHILDREN	
Fasting:	20 – 200
Random:	20 – 100
ADULTS	
Fasting:	10 – 150
Random:	0 – 40

IGF Binding Protein-2 (IGFBP-2)

BLOOD ASSAYS

500284 (E) **500133 (L)**

	RANGE (ng/mL)	MEAN
0 – 11 Months:	348 – 922	567
12 – 23 Months:	280 – 750	460
24 Months – 5 Years:	275 – 700	435
6 – 9 Years:	255 – 540	370
10 – 14 Years:	200 – 470	305
15 – 24 Years:	215 – 518	325
25 – 44 Years:	220 – 570	345
45 – 64 Years:	225 – 710	390
65 – 74 Years:	225 – 850	450
75 – 85 Years:	300 – 1038	560

IGF Binding Protein-3 (IGFBP-3)

BLOOD ASSAYS

500281 (E) **500644 (L)**

	RANGE (mg/L)	MEAN (mg/L)
PREMATURE INFANTS		
0 Days – 1 Month:	0.3 – 1.4	0.9
2 – 3 Months:	0.9 – 2.3	1.6
4 – 5 Months:	0.4 – 2.2	1.5
6 –11 Months:	1.0 – 2.3	1.5
FULL-TERM INFANTS		
0 Days – 1 Month:	0.4 – 1.7	0.9
2 – 3 Months:	0.5 – 2.1	1.3
4 – 5 Months:	0.6 – 2.4	1.4
6 –11 Months:	0.5 – 2.4	1.4
CHILDREN		
12 Months – 4 Years:	0.8 – 3.0	2.1
5 – 6 Years:	1.5 – 3.4	2.4
7 – 8 Years:	2.1 – 4.2	3.0
9 – 11 Years:	2.0 – 4.8	3.3
12 – 13 Years:	2.1 – 6.2	3.8
14 – 15 Years:	2.2 – 5.9	4.2
16 – 18 Years:	2.5 – 4.8	3.8
ADULTS		
19 – 30 Years:	2.0 – 4.2	3.0
31 – 70 Years:	1.9 – 3.6	2.7

IGF-I

BLOOD ASSAYS

500282 (E) **500485 (L)**

	TERM		PRE-TERM*	
	RANGE (ng/mL)	MEAN	RANGE (ng/mL)	MEAN
NEWBORNS AND INFANTS				
Birth:	15 – 109	59	21 – 93	51
1 Day – 2 Months:	15 – 109	55	23 – 163	81
3 – 4 Months:	7 – 124	50	23 – 171	74
5 – 6 Months:	7 – 93	41	15 – 132	61
7 – 11 Months:	15 – 101	56	15 – 179	77

* Values from preterm infants were determined at these ages from expected term gestation

	MALE	MEAN	FEMALE	MEAN
CHILDREN AND YOUNG ADULTS				
1 – 2 Years:	30 – 122	76	56 – 144	100
3 – 4 Years:	54 – 178	116	74 – 202	138
5 – 6 Years:	60 – 228	144	82 – 262	172
7 – 8 Years:	113 – 261	187	112 – 276	194
9 – 10 Years:	123 – 275	199	140 – 308	224
11 – 12 Years:	139 – 395	267	132 – 376	254
13 – 14 Years:	152 – 540	346	192 – 640	416
15 – 16 Years:	257 – 601	429	217 – 589	403
17 – 18 Years:	236 – 524	380	176 – 452	314
19 – 20 Years:	281 – 510	371	217 – 475	323
ADULTS				
21 – 30 Years:	155 – 432	289	87 – 368	237
31 – 40 Years:	132 – 333	226	106 – 368	225
41 – 50 Years:	121 – 237	160	118 – 298	205
51 – 60 Years:	68 – 245	153	53 – 287	172
61 – 70 Years:	60 – 220	132	75 – 263	180
71 – 80 Years:	36 – 215	131	54 – 205	156

Expected values apply to assays performed at Endocrine Sciences only.

IGF-II

BLOOD ASSAYS

500228 (E) **141770 (L)**

	RANGE (ng/mL)	MEAN
PREPUBERTAL	334 – 642	488
PUBERTAL	245 – 737	491
ADULTS	288 – 736	512

Insulin

BLOOD ASSAYS

500220 (E) **500564 (L)**

	RANGE (uU/mL)*
PREPUBERTAL	
0 – 8 Years:	0 – 13
PUBERTAL CHILDREN AND ADULTS	0 – 17
ADULTS	
2 Hours Post Meal (Sustacal):	7.6 – 26
2 Hours Post Glucose (75 gm):	15 – 53

* Following a 4 – 12 hour fast

Insulin Antibodies

BLOOD ASSAYS

500225 (E) **141598 (L)**

	BINDING CAPACITY (uU/mL)
CHILDREN	
4 – 19 Years:	< 5.0
ADULTS	
20 – 40 Years:	< 5.0
TYPE I DIABETES	5 – 420

Insulin, Free and Total

BLOOD ASSAYS

500226 (E) **501561 (L)**

RANGE (uU/mL)

NON–DIABETIC

In the absence of insulin–binding antibodies, the free and total insulin assays are equivalent. However, this assay is intended for use in diabetics with insulin autoantibody present. Measurement is performed on acid–treated samples and, therefore, the sensitivity and absolute values by this method may differ from our direct insulin RIA.

Following a 4 – 12 hour fast:

INFANTS AND PREPUBERTAL CHILDREN 0 – 13 uU/mL

PUBERTAL CHILDREN AND ADULTS 0 – 17 uU/mL

INSULIN DEPENDENT DIABETIC PATIENTS

Total insulin levels are dependent on the binding capacity of circulating antibodies and the patient's insulin dose. Values range from about 50 uU/mL to more than 1000 uU/mL. Free insulin levels vary depending on the capacity and affinity of circulating insulin–binding antibodies and the dose of insulin given to the patient. Values range from non–diabetic levels up to about 100 uU/mL.

Ketosteroids, 17-, (17-KS), Urine (Includes Creatinine)

URINE ASSAYS

500230 (E) **501809 (L)**

	RANGE (mg/24 hours)	RANGE (mg/g creatinine)
CHILDREN		
1 – 4 Years:	< 1.0 – 2.0	Not Determined
5 – 9 Years:	< 1.0 – 3.2	Not Determined
10 – 12 Years:	1.0 – 5.0	Not Determined
13 – 14 Years:	1.0 – 5.5	Not Determined
15 – 16 Years:		
Male:	3.0 – 13	Not Determined
Female:	2.5 – 8.0	Not Determined
ADULTS		
Male:	10 – 25	6 .7 – 12
Female:	6 – 14	5.6 – 10

Leptin

BLOOD ASSAYS

500237 (E) **500716 (L)**

	RANGE (ng/mL) MALE	RANGE (ng/mL) FEMALE
ADULTS (BMI = 22)		
	0.7 – 5.3	3.3 – 18.3

Range is 5th – 95th percentile.

NOTE: Leptin values are gender–dependent and highly correlated with the Body Mass Index (BMI). This reference range is provided only for an average BMI value. Contact Esoterix to obtain reference ranges correlated with other BMI's. To obtain appropriate data, please furnish patient's age and sex, plus height and weight, or BMI.

Luteinizing Hormone (LH), ECL

BLOOD ASSAYS

500234 (E) **502286 (L)**

RANGE (mIU/mL)

(Expressed In Terms of W.H.O. 2ND International Standard, Human Pituitary LH 80/552)

INFANTS

2 Weeks – 11 Months: Values begin to increase about two weeks after birth to a range of 0.02 – 7.0 mIU/mL within the first three months, then decline to prepubertal values by the end of the first year.

PREPUBERTAL CHILDREN

12 Months – 8 Years: 0.02 – 0.3

PUBERTY

TANNER STAGE	AGE (years)	RANGE (mIU/mL)	MEAN (mIU/mL)	TANNER STAGE	AGE (years)	RANGE (mIU/mL)	MEAN (mIU/mL)
MALE				FEMALE			
1	< 9.8	0.02 – 0.3	0.09	1	< 9.2	0.02 – 0.18	0.06
2	9.8 – 14.5	0.2 – 4.9	1.8	2	9.2 – 13.7	0.02 – 4.7	0.72
3	10.7 – 15.4	0.2 – 5.0	1.9	3	10.0 – 14.4	0.10 – 12.0	2.3
4 – 5	11.8 – 17.3	0.4 – 7.0	2.6	4 – 5	10.7 – 18.6	0.4 – 11.7	3.3

ADULTS

Male: 1.5 – 9.0 mIU/mL

Female:

Follicular: 2.0 – 9.0 mIU/mL

Mid–cycle: 18.0 – 49.0 mIU/mL

Luteal: 2.0 – 11.0 mIU/mL

Postmenopausal: 20.0 – 70.0 mIU/mL

Macroprolactin

BLOOD ASSAYS

500375 (E) **500324 (L)**

RANGE

< 50%

NOTE: Normal populations are defined as having low percentage of macroprolactin (<50%).

Metanephrines, Fractionated Urine (Includes Creatinine) URINE ASSAYS

500240 (E) **501533 (L)**

	RANGE (ug/24 hours)	RANGE (ug/g creatinine)
NORMETANEPHRINE		
CHILDREN		
< 1 Year:	Not Determined	180 – 1900
1 – 2 Years:	Not Determined	250 – 830
2 – 8 Years:	Not Determined	150 – 735
8 – 15 Years:	Not Determined	95 – 705
ADULTS	110 – 720	109 – 596
METANEPHRINE		
CHILDREN		
< 1 Year:	Not Determined	150 – 310
1 – 2 Years:	Not Determined	60 – 250
2 – 8 Years:	Not Determined	55 – 460
8 – 15 Years:	Not Determined	70 – 380
ADULTS	35 – 278	22 – 205

Pediatric values were determined on both random and overnight urine collections.

Metanephrines, Total, Urine (Includes Creatinine)

URINE ASSAYS

500242 (E) **500480 (L)**

	RANGE (ug/24 hours)	RANGE (ug/g creatinine)
CHILDREN		
< 1 Year:	Not Determined	410 – 2000
12 – 23 Months:	Not Determined	300 – 1200
24 Months – 7 Years:	Not Determined	200 – 900
8 – 14 Years:	Not Determined	140 – 830
ADULTS	300 – 900	180 – 700

Pediatric values were determined on both random and overnight collections.

Microalbumin, Urine (Includes Creatinine)

URINE ASSAYS

502440 (E) **500870 (L)**

	RANGE (mg/24 hours)	RANGE (mg/g creatinine)
ADULTS		
Overnight Collection:		< 15
24 Hour Collection:	< 25	< 20

Osteocalcin

BLOOD ASSAYS

500245 (E) **500718 (L)**

	RANGE (ng/mL)
0 – 11 Months:	5 – 25
PREPUBERTAL CHILDREN	
12 Months – 7 Years:	5 – 60
PUBERTAL CHILDREN	
8 – 9 Years:	30 – 103
10 – 11 Years:	37 – 154
12 – 15 Years:	42 – 225
ADULTS	2 – 22

Parathyroid Hormone, Intact (IPTH) (Includes Calcium)

BLOOD ASSAYS

500246 (E) **500692 (L)**

	RANGE
CHILDREN AND ADULTS	10 – 65 pg/mL

Pregnanetriol, Urine (Includes Creatinine)

URINE ASSAYS

500256 (E) **500340 (L)**

	RANGE (mg/24 hour)	RANGE (mg/g creatinine)
INFANTS	<0.2	Not Determined
CHILDREN	<1.0	0.1 – 0.9
ADULTS	<2.0	0.1 – 1.6

Pregnenolone, HPLC-MS/MS

BLOOD ASSAYS

500258 (E) **140707 (L)**

	RANGE (ng/dL)
PREMATURE INFANTS	
26 – 28 Weeks, Day 4:	260 – 2104
34 – 36 Weeks, Day 4:	203 – 1024
NEONATES	
1 – 7 Days:	150 – 2000

Levels decrease after birth, and are within the prepubertal range by three months.

PREPUBERTAL CHILDREN	20 – 140
PUBERTAL AND ADULTS	< 20 – 150

Progesterone, HPLC-MS/MS

BLOOD ASSAYS

500266 (E) **500167 (L)**

MALES	RANGE (ng/dL)
1-16 Years	<10 – 15
Adults	<10 – 11

FEMALES	RANGE
1 – 10 Years	<10 – 26
11 Years	<10 – 255
12 Years	<10 – 856
13 Years	<10 – 693
14 Years	<10 – 1204
15 Years	<10 – 1076
16 Years	<10 – 1294

ADULT CYCLE DAYS	RANGE
1 – 6	<10 – 17
7 – 12	<10 – 135
13 – 15	<10 – 1563
16 – 28	<10 – 2555

POST MENOPAUSAL	<10

Note: Luteal progesterone peaked from 350 to 3750 ng/dL on days ranging from 17 to 23.

Proinsulin, Plasma

BLOOD ASSAYS

500272 (E) **500722 (L)**

	PROINSULIN RANGE (pM/L)	PROINSULIN/INSULIN* (Molar Ratio As %) RANGE
NORMAL CHILDREN		
Fasting:	1.8 – 10	6.4 – 16
NORMAL ADULTS		
Fasting:	1.7 – 12	3.4 – 21

* Ratio calculated using actual insulin value, not the sum of insulin and proinsulin in the denominator.

Prolactin

BLOOD ASSAYS

500274 (E) **500557 (L)**

	RANGE (ng/mL)
NEWBORN	
1 – 7 Days:	30 – 495
1 – 8 Weeks:	Values decline during the first two months of life to those observed in adult males 3-18 and females 3-24.
CHILDREN AND ADULTS	
Male:	3 – 18
Female:	3 – 24

Renin, Plasma (Plasma Renin Activity)

BLOOD ASSAYS

500278 (E) **500458 (L)**

	RANGE (ng/dL/hr)
PREMATURE	
1 – 7 Days:	1100 – 16, 700
FULLTERM	
1 – 7 Days:	200 – 3500

Plasma renin activity in newborns is elevated and highly variable. Premature infants generally exhibit substantially higher values ranging from 1100 – 16,700 ng/dL/hr.

CHILDREN*		
31 Days – 11 Months:	235 – 3700	
12 Months – 2 Years:	171 – 1115	
3 – 4 Years:	100 – 650	
5 – 9 Years:	50 – 585	
10 – 14 Years:	50 – 330	
	SUPINE RANGE (ng/dL/hr)	**UPRIGHT RANGE (ng/dL/hr)**
ADULTS**	20 – 160	70 – 330

* Normal Sodium Diet, Supine Posture
** Normal Sodium Diet

NOTE: Normal studies of plasma renin activity in young children and adolescents are incomplete.

Sex Hormone Binding Globulin (SHBG), IRMA

BLOOD ASSAYS

500299 (E) **500848 (L)**

	RANGE (nmol/L)
INFANTS	
1 Month – 2 Years:	60 – 252
PREPUBERTAL CHILDREN	
1 – 8 Years:	72 – 220
PUBERTAL AGES	
Males:	16 – 100
Females:	36 – 125
ADULTS	
Males:	20 – 60
Females:	
Premenopausal	40 – 120
Postmenopausal	28 – 112

Testosterone, Bioavailable

BLOOD ASSAYS

500288 (E) **500650 (L)**

	RANGE(ng/dL)
INFANTS AND PREPUBERTAL CHILDREN	
1 – 9 Years:	< 0.2 – 1.3 ng/dL

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	< 0.2 – 3.4		1	< 9.2	< 0.2 – 3.4	
2	9.8 – 14.5	2 – 58	12	2	9.2 – 13.7	0.8 – 4.7	3.6
3	10.7 – 15.4	12 – 70	30	3	10.0 – 14.4	1.1 – 9.6	4.7
4 – 5	11.8 – 17.3	84 – 350	210	4 – 5	10.7 – 18.6	2.3 – 13.9	6.1

ADULTS	**RANGE (ng/dL)**
Male:	
20 – 39 Yrs:	128 – 430
40 – 49 yrs	95 – 350
50 – 69 yrs	95 – 285
70 – 79 yrs	60 – 240
Female:	1.1 – 14.3

NOTE: For additional information on interpretation of Bioavailable Testosterone levels, contact the laboratory.

Testosterone, Free

BLOOD ASSAYS

500290 (E) **500102 (L)**

	MALE RANGE (pg/mL)	FEMALE RANGE (pg/mL)
FULL–TERM INFANTS		
1 – 15 Days:	1.5 – 31	0.5 – 2.5
1 – 2 Months:	3.3 – 18	0.1 – 1.3
3 – 4 Months:	0.7 – 14	0.3 – 1.1
5 – 6 Months:	0.4 – 4.8	0.2 – 0.6
PREPUBERTAL CHILDREN		
1 – 10 Years:	0.15 – 0.6	Same as males
PUBERTY	Comprehensive values for free testosterone by dialysis for both males and females throughout puberty are currently unavailable.	
ADULTS	52 – 280	1.1 – 6.3

% FREE TESTOSTERONE

	MALE RANGE (%)	FEMALE RANGE (%)
FULL–TERM INFANTS		
1 – 15 Days:	0.9 – 1.7	0.8 – 1.5
1 – 2 Months:	0.4 – 0.8	0.4 – 1.1
3 – 4 Months:	0.4 – 1.1	0.5 – 1.0
5 – 6 Months:	0.4 – 1.0	0.5 – 0.8
PREPUBERTAL CHILDREN		
1 – 10 Years:	0.4 – 0.9	Same as males
PUBERTY	Comprehensive values for free testosterone by dialysis for both males and females throughout puberty are currently unavailable.	
ADULTS	1.5 – 3.2	0.8 – 1.4

Testosterone, Total, HPLC-MS/MS

BLOOD ASSAYS

500286 (E) **500159 (L)**

	MALE RANGE (ng/dL)	FEMALE RANGE (ng/dL)
PREMATURE INFANTS		
26 – 28 Weeks, Day 4:	59 – 125	5 – 16
31 – 35 Weeks, Day 4:	37 – 198	5 – 22
	RANGE (ng/dL)	
FULL-TERM INFANTS		
Newborns 1 – 7 Months:	75 – 400	20 – 64

Male: Levels decrease rapidly the first week to 20 – 50 ng/dL, then increase to 60 – 400 ng/dL (Mean = 190) between 20 – 60 days. Levels then decline to prepubertal range of < 3 – 10 by seven months.

Female: Levels decrease during the first month to <10 ng/dL and remain there until puberty.

PREPUBERTAL CHILDREN

1 – 10 Years: < 3 – 10

PUBERTY

TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)	TANNER STAGE	AGE (years)	RANGE (ng/dL)	MEAN (ng/dL)
MALE				FEMALE			
1	< 9.8	< 3 – 10	4.9	1	< 9.2	< 3 – 10	4.9
2	9.8 – 14.5	18 – 150	42	2	9.2 – 13.7	7 – 28	18
3	10.7 – 15.4	100 – 320	190	3	10.0 – 14.4	15 – 35	25
4	11.8 – 16.2	200 – 620	372	4	10.7 – 15.6	13 – 32	22
5	12.8 – 17.3	350 – 970	546	5	11.8 – 18.6	20 – 38	28

ADULTS 20 – 50 Years	**RANGE (ng/dL)**
Male:	350 – 1030
Female:	
Premenopausal:	10 – 55
Postmenopausal:	7 – 40

Thyroglobulin (w/Anti-thyroglobulin Screen), Comprehensive

BLOOD ASSAYS

500316 (E) **500540 (L)**

	RANGE (ng/mL)	MEAN (ng/mL)
THYROGLOBULIN ICMA		
PREPUBERTAL CHILDREN	2.9 – 56	17
PUBERTAL CHILDREN AND ADULTS	1.3 – 37	8.5

Assay quantification limit: <0.1

THYROGLOBULIN RIA		
INFANTS		
1 – 12 Months	12 –113	42
PREPUBERTAL CHILDREN	5 – 72	29
PUBERTAL CHILDREN AND ADULTS	< 3 – 39	16

Assay quantification limit: <2.0

Thyroglobulin Antibodies (Anti-Tg)

BLOOD ASSAYS

500038 (E) **500555 (L)**

	RANGE (IU/mL)
Negative	<1.0
Positive	>or = 1.0

Low positive Thyroglobulin antibodies are seen in a portion of the asymptomatic populations

Thyroid Peroxidase Antibodies (Anti-TPO)

BLOOD ASSAYS

500042 (E) **500638 (L)**

	RANGE (IU/mL)
ALL AGES	0 – 20

Thyroid Stimulating Hormone (TSH), ICMA

BLOOD ASSAYS

500305 (E) **500477 (L)**

	RANGE (uU/mL)
PREMATURE INFANTS	
26 – 32 Weeks, Day 3 – 4:	0.8 – 6.9
FULL TERM INFANTS	
Day 4:	1.3 – 16
Newborns:	TSH surges within the first 15 – 60 minutes of life reaching peak levels between 25 – 160 at about 30 minutes. Values then decline rapidly and after one week are within the adult normal range.
1 – 11 Months:	0.9 – 7.7
PREPUBERTAL CHILDREN	0.6 – 5.5
PUBERTAL CHILDREN AND ADULTS	0.5 – 4.8

Thyroxine (T-4)

BLOOD ASSAYS

500310 (E) **500348 (L)**

	RANGE (ug/dL)
PREMATURE INFANTS	
26 – 30 Weeks, Day 3 – 4:	2.6 – 14.0
FULL–TERM INFANTS	
1 – 3 Days:	8.2 – 19.9
1 Week:	6.0 – 15.9
1 – 11 Months:	6.1 – 14.9
PREPUBERTAL CHILDREN	
12 Months – 2 Years:	6.8 – 13.5
3 – 9 Years:	5.5 – 12.8
PUBERTAL CHILDREN	
11 – 17 Years:	4.9 – 13.0
ADULTS	4.2 – 13.0

Thyroxine Binding Globulin (TBG)

BLOOD ASSAYS

500318 (E) **500724 (L)**

	RANGE (ug/dL)
CHILDREN	12.7 – 27.9
ADULTS	13.0 – 39.0

Thyroxine, Free by Dialysis and MS

BLOOD ASSAYS

500329 (E) **501902 (L)**

	RANGE (ng/dL)
1 – 11 YEARS	0.65 – 1.9
PUBERTAL CHILDREN AND ADULTS	0.8 – 1.7
PREGNANT FEMALES	
1st Trimester (0-13.3 wks)	0.65 – 1.4
2nd Trimester (13.4-26.6 wks)	0.5 – 1.3
3rd Trimester (>26.6 wks)	0.5 – 1.1

Thyroxine, Free Automated

BLOOD ASSAYS

504001 (E) **500835 (L)**

	RANGE (ng/dL)
ADULTS (≥ 18YRS)	0.89 – 1.76

Triiodothyronine (T-3)

BLOOD ASSAYS

500322 (E) **500563 (L)**

	RANGE (ng/dL)
PREMATURE INFANTS	
26 – 30 Weeks, Day 3 – 4:	24 – 132
FULL–TERM INFANTS	
1 – 3 Days:	89 – 405
1 Week:	91 – 300
1 – 11 Months:	85 – 250
PREPUBERTAL CHILDREN	119 – 218
PUBERTAL CHILDREN	
11 – 17 Years:	80 – 185
ADULTS	55 – 170

Triiodothyronine, Free Only

BLOOD ASSAYS

500323 (E) **500834 (L)**

	RANGE (pg/mL)
ADULTS	2.3 – 4.2

Triiodothyronine, Reverse *RUO*

BLOOD ASSAYS

500326 (E) **500875 (L)**

	RANGE (ng/dL)
NEWBORNS	90 – 250

Reverse T–3 levels are elevated at birth and during the first few days of life. Values then decrease rapidly and are within the adult range by one week.

CHILDREN AND ADULTS	10 – 50

TSH Receptor Antibody (TRAb)

BLOOD ASSAYS

500308 (E) **500538 (L)**

	RANGE (U/L)
ALL AGES	Antibody Titer
	<1 U/L = Negative 1.1 - 1.5 U/L = Equivocal >1.5 U/L = Positive

Vanillylmandelic Acid (VMA), Urine (Includes Creatinine)

URINE ASSAYS

500330 (E) **500496 (L)**

	RANGE (mg/24 hours)	RANGE (mg/g creatinine)
CHILDREN		
Birth – 11 Months:	Not Determined	3 – 17
12 – 23 Months:	Not Determined	4 – 12
24 Months – 14 Years:	Not Determined	2 – 11
ADULTS	0.7 – 6.8	1.5 – 7.0

Pediatric values were determined on both random and 8 hour urine collections.

Vitamin D, 1, 25-Dihydroxy

BLOOD ASSAYS

500342 (E) **500600 (L)**

	RANGE (pg/mL)
NEWBORNS	
0 – 30 Days	<10 – 72
INFANTS AND CHILDREN	
31 Days – 17 Years	15 – 90
ADULTS	
> 18 Years	21 – 65

Vitamin D, 25-Hydroxy, HPLC-MS/MS

BLOOD ASSAYS

500338 (E) **500510 (L)**

	RANGE (ng/mL)
NEWBORNS	5 – 42
CHILDREN AND ADULTS	10 – 55

Note: Adult target levels are 32-100 ng/mL

Vitamin D, 25-Hydroxy Fractionated, HPLC-MS/MS

BLOOD ASSAYS

500337 (E) **500116 (L)**

Reference range provided is the same as Total Vitamin D above

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
ACTH (Corticotropin)	pmol/L	4.5000	pg/mL
Antidiuretic Hormone (ADH)	pmol/L	1.0840	pg/mL
Albumin	g/L	0.1000	g/dL
Aldosterone, Serum	pmol/L	0.0360	ng/dL
Aldosterone, Urine	nmol/d	0.3604	ug/24 h
Aldosterone/Creatinine	nmol/mmol	3.1859	ug/g
Androstanediol	pmol/L	0.0292	ng/dL
Androstanediol Glucuronide	pmol/L	0.0469	ng/dL
Androstenedione	pmol/L	0.0286	ng/dL
Androsterone, Urine	umol/d	0.2905	mg/24 h
Androsterone/Creatinine	umol/mmol	2.5680	mg/g
Angiotensin I	pmol/L	1.2960	pg/mL
Angiotensin II	pmol/L	1.0460	pg/mL
Angiotensin III	pmol/L	0.9310	pg/mL
Angiotensin I Converting Enzyme	U/L	1.0000	mU/mL
Atrial Natriuretic Peptide (ANP)	pmol/L	3.0800	pg/mL
C-Peptide	nmol/L	3.0210	ng/mL
C-Peptide, Urine	nmol/L	3.0210	ng/mL
C-Peptide/Creatinine	nmol/mmol	26.7109	ug/g
Calcitonin	pmol/L	3.4180	pg/mL
Calcium	mmol/L	4.0080	mg/dL
Calcium, Urine	mmol/d	40.0800	mg/24 h

Expected values apply to assays performed at Endocrine Sciences only.

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Catecholamines, Urine	nmol/d	0.1762	ug/24 h
Catecholamines/Creatinine	nmol/mmol	1.5572	ug/g
Corticosterone	pmol/L	0.0347	ng/dL
18-Hydroxycorticosterone	pmol/L	0.0362	ng/dL
Cortisol, Serum	nmol/L	0.0363	ug/dL
Cortisol, Urine	nmol/d	0.3625	ug/24 h
Cortisol/Creatinine	nmol/mmol	3.2045	ug/g
Cortisone	pmol/L	0.0361	ng/dL
Creatinine, Urine	umol/d	0.1131	mg/24 h
Cyclic Amp, Urine	umol/L	1.0000	nmol/mL
Cyclic Amp/Creatinine	nmol/mmol	0.0088	umol/g
Dehydroepiandrosterone (DHEA)	pmol/L	0.0288	ng/dL
Dehydroepiandrosterone-Sulfate (DHEA-S)	nmol/L	0.0368	ug/dL
Deoxycorticosterone (DOC)	pmol/L	0.0331	ng/dL
18-Hydroxydeoxycorticosterone (18-OH-DOC)	pmol/L	0.0347	ng/dL
11-Desoxycortisol (Compound S)	pmol/L	0.0346	ng/dL
Dexamethasone	pmol/L	0.0393	ng/dL
Dihydrotestosterone (DHT)	pmol/L	0.0290	ng/dL
Dopamine, Plasma	pmol/L	0.1530	pg/mL
Dopamine, Urine	nmol/d	0.1530	ug/24 h

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Dopamine/Creatinine	nmol/mmol	1.3528	ug/g
Endorphin, Beta	pmol/L	4.0000	pg/mL
Epinephrine, Plasma	pmol/L	0.1831	pg/mL
Ephinephrine, Urine	nmol/d	0.1831	ug/24 h
Epinephrine/Creatinine	nmol/mmol	1.6186	ug/g
Estradiol	pmol/L	0.0272	ng/dL
Estriol	pmol/L	0.0288	ng/dL
Estrogens, Serum	pmol/L	0.0271	ng/dL
Estrone	pmol/L	0.0270	ng/dL
Estrone Sulfate	pmol/L	0.0350	ng/dL
Folic Acid	pmol/L	0.0441	ng/dL
Follicle Stimulating Hormone (FSH)	IU/L	1.0000	mIU/mL
Follicle Stimulating Hormone, Urine	IU/d	1.0000	IU/24 h
FSH/Creatinine	IU/mmol	8.8420	IU/g
Gastrin	ng/L	1.0000	pg/mL
Glucagon	ng/L	1.0000	pg/mL
Growth Hormone	ug/L	1.0000	ng/mL
Human Chorionic Gonadotropin (HCG)	IU/L	1.0000	mIU/mL
HCG, Urine	IU/d	1.0000	IU/24 h
HCG/Creatinine	IU/mmol	8.8420	IU/g
5-Hydroxyindoleacetic Acid (5-HIAA), Urine	nmol/d	0.1912	ug/24 h

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
5-HIAA/Creatinine	nmol/mmol	1.6906	ug/g
Homovanillic Acid (HVA), Urine	nmol/d	0.1822	ug/24 h
HVA/Creatinine	nmol/mmol	1.6110	ug/g
17-Hydroxycorticosteroids, Urine	nmol/d	0.3625	ug/24 h
17-Hydroxycorticosteroids/Creatinine	nmol/mmol	3.2045	ug/g
IGF-I (Somatomedin C)	nmol/L	7.6490	ng/mL
IGF-II	nmol/L	7.5000	ng/mL
Inhibin	U/L	0.0010	U/mL
Insulin	pmol/L	0.1394	uU/mL
17-Ketosteroids, Urine	umol/d	0.2884	mg/24 h
17-Ketosteroids/Creatinine	umol/mmol	2.5495	mg/g
Luteinizing Hormone (LH)	IU/L	1.0000	mIU/mL
Luteinizing Hormone, Urine	IU/d	1.0000	IU/24 h
LH/Creatinine	IU/mmol	8.8420	IU/g
Metanephrine, Urine	nmol/d	0.1972	ug/24 h
Metanephrine/Creatinine	nmol/mmol	1.7432	ug/g
Metanephrines,Total, Urine	nmol/d	0.1902	ug/24 h
Metanephrines,Total/Creatinine	nmol/mmol	1.6814	ug/g
Methoxytyramine, Urine	nmol/d	0.1672	ug/24 h
Methoxytyramine/Creatinine	nmol/mmol	1.4786	ug/g
Norepinephrine, Plasma	pmol/L	0.1692	pg/mL
Norepinephrine, Urine	nmol/d	0.1692	ug/24 h
Norepinephrine/Creatinine	nmol/mmol	1.4957	ug/g

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Normetanephrine, Urine	nmol/d	0.1832	ug/24 h
Normetanephrine/Creatinine	nmol/mmol	1.6195	ug/g
Osteocalcin	nmol/L	6.5000	ng/mL
Parathyroid Hormone	pmol/L	9.5000	pg/mL
Prednisolone	pmol/L	0.0361	ng/dL
Prednisone	pmol/L	0.0358	pmol/L
Pregnanediol, Urine	umol/d	0.3205	mg/24 h
Pregnanediol/Creatinine	ng/dLumol	2.8332	mg/g/mmol
Pregnanetriol, Urine	umol/d	0.3365	mg/24 h
Pregnanetriol/Creatinine	umol/mmol	2.9747	mg/g
Pregnenolone	pmol/L	0.0317	ng/dL
17-Hydroxypregnenolone	pmol/L	0.0333	ng/dL
Progesterone	pmol/L	0.0315	ng/dL
17-Hydroxyprogesterone	pmol/L	0.0331	ng/dL
20-Hydroxyprogesterone	pmol/L	0.0317	ng/dL
Prolactin	ug/L	1.0000	ng/mL
Renin (Plasma Renin Activity)	ng/L/s	3.6000	ng/mL/h
Reverse T-3	pmol/L	0.0651	ng/dL
Secretin	pmol/L	3.0550	pg/mL
Sex Hormone Binding Globulin (SHBG)	nmol/L	0.0288	ug/dL

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
(Binding Capacity)			
Somatostatin-14	pmol/L	1.6380	pg/mL
Somatostatin-28	pmol/L	3.2760	pg/mL
Testosterone	pmol/L	0.0288	ng/dL
Free Testosterone	pmol/L	0.2884	pg/mL
Testosterone, Urine	nmol/d	0.2884	ug/24 h
Testosterone/Creatinine	nmol/mmol	2.5495	ug/g
Thyroglobulin	ug/L	1.0000	ng/mL
Thyroid Stimulating Hormone (TSH)	mU/L	1.0000	uU/mL
Thyroxine (T-4)	nmol/L	0.0777	ug/dL
Thyroxine Binding Globulin	mg/L	0.1000	mg/dL
Thyrotropin Releasing Hormone (TRH)	pmol/L	0.3620	pg/mL
Triiodothryonine (T-3)	pmol/L	0.0651	ng/dL
Vanillylmandelic Acid (VMA), Urine	nmol/d	0.1982	ug/24 h
VMA/Creatinine	nmol/mmol	1.7525	ug/g
Vitamin B-12	pmol/L	0.1355	ng/dL
25-Hydroxy-Vitamin D	nmol/L	0.4006	ng/mL
1, 25-Dihydroxy-Vitamin D	pmol/L	0.4166	pg/mL

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
ACTH (Corticotropin)	pg/mL	0.2222	pmol/L
Antidiuretic Hormone (ADH)	pg/mL	0.9225	pmol/L
Albumin	g/dL	10.0000	g/L
Aldosterone, Serum	ng/dL	27.7469	pmol/L
Aldosterone, Urine	ug/24 h	2.7747	nmol/d
Aldosterone/Creatinine	ug/g	0.3139	nmol/mmol
Androstanediol	ng/dL	34.1997	pmol/L
Androstanediol Glucuronide	ng/dL	21.3447	pmol/L
Androstenedione	ng/dL	34.9162	pmol/L
Androsterone, Urine	mg/24 h	3.4423	umol/d
Androsterone/Creatinine	mg/g	0.3894	umol/mmol
Angiotensin I	pg/mL	0.7716	pmol/L
Angiotensin II	pg/mL	0.9560	pmol/L
Angiotensin III	pg/mL	1.0741	pmol/L
Angiotensin I Converting Enzyme	mU/mL	1.0000	U/L
Atrial Natriuretic Peptide (ANP)	pg/mL	0.3247	pmol/L
C-Peptide	ng/mL	0.3310	nmol/L
C-Peptide, Urine	ng/mL	0.3310	nmol/L
C-Peptide/Creatinine	ug/g	0.0374	nmol/mmol
Calcitonin	pg/mL	0.2926	pmol/L
Calcium	mg/dL	0.2495	mmol/L
Calcium, Urine	mg/24 h	0.0250	mmol/d

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Catecholamines, Urine	ug/24 h	5.6770	nmol/d
Catecholamines/Creatinine	ug/g	0.6422	nmol/mmol
Corticosterone	ng/dL	28.8600	pmol/L
18-Hydroxycorticosterone	ng/dL	27.5938	pmol/L
Cortisol, Serum	ug/dL	27.5862	nmol/L
Cortisol, Urine	ug/24 h	2.7586	nmol/d
Cortisol/Creatinine	ug/g	0.3121	nmol/mmol
Cortisone	ng/dL	27.7393	pmol/L
Creatinine, Urine	mg/24 h	8.8420	umol/d
Cyclic Amp, Urine	nmol/mL	1.0000	umol/L
Cyclic Amp/Creatinine	umol/g	113.1000	nmol/mmol
Dehydroepiandrosterone (DHEA)	ng/dL	34.6741	pmol/L
Dehydroepiandrosterone-Sulfate (DHEA-S)	ug/dL	27.2109	nmol/L
Deoxycorticosterone (DOC)	ng/dL	30.2572	pmol/L
18-Hydroxydeoxycorticosterone (18-OH-DOC)	ng/dL	28.8600	pmol/L
11-Desoxycortisol (Compound S)	ng/dL	28.8684	pmol/L
Dexamethasone	ng/dL	25.4777	pmol/L
Dihydrotestosterone (DHT)	ng/dL	34.4353	pmol/L
Dopamine, Plasma	pg/mL	6.5359	pmol/L
Dopamine, Urine	ug/24 h	6.5359	nmol/d
Dopamine/Creatinine	ug/g	0.7392	nmol/mmol

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Endorphin, Beta	pg/mL	0.2500	pmol/L
Epinephrine, Plasma	pg/mL	5.4615	pmol/L
Ephinephrine, Urine	ug/24 h	5.4615	nmol/d
Epinephrine/Creatinine	ug/g	0.6178	nmol/mmol
Estradiol	ng/dL	36.7107	pmol/L
Estriol	ng/dL	34.6741	pmol/L
Estrogens, Serum	ng/dL	36.8450	pmol/L
Estrone	ng/dL	36.9822	pmol/L
Estrone Sulfate	ng/dL	28.6123	pmol/L
Folic Acid	ng/dL	22.6552	pmol/L
Follicle Stimulating Hormone (FSH)	mIU/mL	1.0000	IU/L
Follicle Stimulating Hormone, Urine	IU/24 h	1.0000	IU/d
FSH/Creatinine	IU/g	0.1131	IU/mmol
Gastrin	pg/mL	1.0000	ng/L
Glucagon	pg/mL	1.0000	ng/L
Growth Hormone	ng/mL	1.0000	ug/L
Human Chorionic Gonadotropin (HCG)	mIU/mL	1.0000 I	U/L
HCG, Urine	IU/24 h	1.0000	IU/d
HCG/Creatinine	IU/g	0.1131	IU/mmol
5-Hydroxyindoleacetic Acid (5-HIAA), Urine	ug/24 h	5.2301	nmol/d

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Homovanillic Acid (HVA), Urine	ug/24 h	5.4885	nmol/d
HVA/Creatinine	ug/g	0.6207	nmol/mmol
17-Hydroxycorticosteroids, Urine	ug/24 h	2.7586	nmol/d
17-Hydroxycorticosteroids/Creatinine	ug/g	0.3121	nmol/mmol
IGF-I (Somatomedin C)	ng/mL	0.1307	nmol/L
IGF-II	ng/mL	0.1333	nmol/L
IGF-II	ng/mL	0.1333	nmol/L
Inhibin	U/mL	1000.0	U/L
Insulin	uU/mL	7.1750	pmol/L
17-Ketosteroids, Urine	mg/24 h	3.4674	umol/d
17-Ketosteroids/Creatinine	mg/g	0.3922	umol/mmol
Luteinizing Hormone (LH)	mIU/mL	1.0000	IU/L
Luteinizing Hormone, Urine	IU/24 h	1.0000	IU/d
LH/Creatinine	IU/g	0.1131	IU/mmol
Metanephrine, Urine	ug/24 h	5.0710	nmol/d
Metanephrine/Creatinine	ug/g	0.5736	nmol/mmol
Metanephrines,Total, Urine	ug/24 h	5.2576	nmol/d
Metanephrines,Total/Creatinine	ug/g	0.5948	nmol/mmol
Methoxytyramine, Urine	ug/24 h	5.9809	nmol/d
Methoxytyramine/Creatinine	ug/g	0.6764	nmol/mmol
Norepinephrine, Plasma	pg/mL	5.9100	pmol/L
Norepinephrine, Urine	ug/24 h	5.9100	nmol/d
Norepinephrine/Creatinine	ug/g	0.6686	nmol/mmol

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
Normetanephrine, Urine	ug/24 h	5.4585	nmol/d
Normetanephrine/Creatinine	ug/g	0.6175	nmol/mmol
Osteocalcin	ng/mL	0.1538	nmol/L
Parathyroid Hormone	pg/mL	0.1053	pmol/L
Prednisolone	ng/dL	27.7393	pmol/L
Prednisone	ng/dL	27.9018	pmol/L
Pregnanediol, Urine	mg/24 h	3.1201	umol/d
Pregnanediol/Creatinine	mg/g	0.3530	umol/mmol
Pregnanetriol, Urine	mg/24 h	2.9718	umol/d
Pregnanetriol/Creatinine	mg/g	0.3362	umol/mmol
Pregnenolone	ng/dL	31.5956	pmol/L
17-Hydroxypregnenolone	ng/dL	30.0752	pmol/L
Progesterone	ng/dL	31.7965	pmol/L
17-Hydroxyprogesterone	ng/dL	30.2572	pmol/L
20-Hydroxyprogesterone	ng/dL	31.5956	pmol/L
Prolactin	ng/mL	1.0000	ug/L
Renin (Plasma Renin Activity)	ng/mL/h	0.2778	ng/L/s
Reverse T-3	ng/dL	15.3610	pmol/L
Secretin	pg/mL	0.3273	pmol/L
Sex Hormone Binding Globulin (SHBG)	ug/dL	34.6741	nmol/L

Expected values apply to assays performed at Endocrine Sciences only.

HORMONE	WHEN YOU KNOW	MULTIPLY BY	TO FIND
(Binding Capacity)			
Somatostatin-14	pg/mL	0.6105	pmol/L
Somatostatin-28	pg/mL	0.3053	pmol/L
Testosterone	ng/dL	34.6741	pmol/L
Free Testosterone	pg/mL	3.4674	pmol/L
Testosterone, Urine	ug/24 h	3.4674	nmol/d
Testosterone/Creatinine	ug/g	0.3922	nmol/mmol
Thyroglobulin	ng/mL	1.0000	ug/L
Thyroid Stimulating Hormone (TSH)	uU/mL	1.0000	mU/L
Thyroxine (T-4)	ug/dL	12.8717	nmol/L
Thyroxine Binding Globulin	mg/dL	10.0000	mg/L
Thyrotropin Releasing Hormone (TRH)	pg/mL	2.7624	pmol/L
Triiodothryonine (T-3)	ng/dL	15.3610	pmol/L
Vanillylmandelic Acid (VMA), Urine	ug/24 h	5.0454	nmol/d
VMA/Creatinine	ug/g	0.5706	nmol/mmol
Vitamin B-12	ng/dL	7.3779	pmol/L
25-Hydroxy-Vitamin D	ng/mL	2.4963	nmol/L
1, 25-Dihydroxy-Vitamin D	pg/ml	2.4004	pmol/L

DISCLAIMER:

This data applies to the highly sensitive and specific assay methods developed, validated, and performed solely at Endocrine Sciences.

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