

**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

## TABLE OF CONTENTS

Introduction .....	2 – 3
Expected Values .....	4 – 73
S.I. Unit Conversion Table .....	74 – 85

(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)**

	<b>Range (mg/L)</b>	<b>Mean</b>
<b>INFANTS</b>		
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
<b>PREPUBERTAL</b>		
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
<b>PUBERTAL</b>		
11 – 13 Years:	5.6 – 16	12
14 – 18 Years:	5.6 – 16	12
<b>ADULTS</b>		
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

**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.

**Adrenocorticotrophic 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:

&lt; 50 Years: 0.05 – 0.53

&gt;/= 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: &lt; 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: &lt;10 – 279

Levels decrease rapidly to a range of &lt;52 ng/dL after one week.

1 – 11 Months: &lt;10 – 37

Androstenedione gradually decreases during the first six months to prepubertal levels.

**PREPUBERTAL CHILDREN**

1 – 10 Years: &lt;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

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

&lt;20.2

**FEMALES**

Premenopausal: &lt;=14.3

Postmenopausal: &lt;=22.4

**Calcitonin**

BLOOD ASSAYS

**500047 (E)****500636 (L)****RANGE (pg/mL)****MALES**

0 – 150y: &lt; 8.4

**FEMALES**

0 – 150y: &lt; 5.0

**Catecholamines, Fractionated, Plasma**

BLOOD ASSAYS

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

	<u>NOREPINEPHRINE</u> RANGE (pg/mL)	<u>EPINEPHRINE</u> RANGE (pg/mL)
<b>NEWBORN</b>		
1 – 7 Days:	200 – 420	20 – 130
<b>CHILDREN</b>		
1 – 16 Years:		
Basal:	150 – 400	20 – 115
<b>ADULTS</b>		
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**

&lt; 1 Year:

Not Determined

37 – 195

**CHILDREN**

1 – 10 Years:

Not Determined

24 – 140

**OLDER CHILDREN  
AND ADULTS**

16 – 125

12 – 110

**EPINEPHRINE****INFANTS**

&lt; 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)**

	<b>RANGE (ug/24 hours)</b>	<b>RANGE (ug/g creatinine)</b>
<b>INFANTS</b>		
< 1 Year:	Not Determined	34 – 286
<b>CHILDREN</b>		
1 – 10 Years:	Not Determined	16 – 255
<b>OLDER CHILDREN AND ADULTS</b>	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)**

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

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

URINE ASSAYS

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

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

**Cortisol, Saliva, HPLC-MS/MS**

SALIVA ASSAYS

**500094 (E)****500179 (L)****CHILDREN and ADULTS****RANGE (ug/dL)**

8:00 a.m. 0.025 – 0.600

Noon &lt;0.010 – 0.330

4:00 p.m. 0.010 – 0.200

Midnight &lt;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**

	<b><u>8:00 a.m.</u></b>	<b><u>4:00 p.m.</u></b>
12 Month – 15 Years:	3.0 – 21	

**ADULTS**

8.0 – 19	4.0 – 11
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**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
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**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
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**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: &lt; 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**

21 – 30 Years: 100 – 460

31 – 40 Years: 88 – 305

41 – 50 Years: 70 – 218

51 – 60 Years: 29 – 220

61 – 70 Years: 26 – 213

71 – 80 Years: 20 – 172

**MALE RANGE (ug/dL)****FEMALE RANGE (ug/dL)**

76 – 255

48 – 247

19 – 210

20 – 157

10 – 115

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

**Deoxyipyridinolines, Urine (Includes Creatinine)**

URINE ASSAYS

**500127 (E)****500211 (L)****RANGE****ADULTS**

Males: up to 5.4 nmole/m mole creatinine

Females:

Premenopausal: up to 7.4 nmole/m mole creatinine

Postmenopausal: up to 8.5 nmole/m mole 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: &lt; 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: &lt; 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.:	140 – 295
Following 1 mg Dexamethasone, Previous Evening	
8:00 a.m.:	1600 – 2850
Following 8 mg Dexamethasone, (4 x 2 mg Doses) Previous Day	

**Dihydrotestosterone (DHT), HPLC-MS/MS**

BLOOD ASSAYS

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

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

**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)
<b>MALE</b>				<b>FEMALE</b>			
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:

&lt; 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:

&lt; 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 &lt; 2.5 by seven days.

30 Days – 11 Months:

Male:

Levels increase to 1.0 – 4.0 between 30 – 60 days then decline to &lt; 2.5 by 12 months

Female:

Levels increase to 1.0 – 6.0 between 30 – 60 days then decline to &lt; 2.5 by 12 months

**PREPUBERTAL CHILDREN**

1 – 10 Years:

&lt; 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:

&lt; 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 &amp; 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**

&lt; 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)****ALL AGES****RANGE**

Negative

**Growth Hormone Binding Protein (GHBP)**

BLOOD ASSAYS

**500209 (E)****500177 (L)****RANGE (pmol/L)****CHILDREN**

Under 2 Years:

&lt;125 – 762

2 – 9 Years:

267 – 1638

10 – 14 Years:

431 – 1892

**ADULTS**

20 – 50 Years:

686 – 2019

**LARON DWARFISM**

&lt; 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*

	<b>RANGE (mg/24 hours)</b>	<b>RANGE (mg/g creatinine)</b>
<b>PREPUBERTAL CHILDREN</b>		
1 – 4 Years:	0.2 – 2.5	1.7 – 6.4
5 – 9 Years:	0.5 – 2.5	2.2 – 6.0
<b>PUBERTAL CHILDREN AND ADULTS</b>		
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)**

	<b>18-OH-Corticosterone RANGE (ng/dL)</b>	<b>18-OH-Corticosterone/ Aldosterone Ratio RANGE (ng/dL)</b>
<b>PREMATURE INFANTS</b>		
26 – 28 Weeks, Day 4:	10 – 670	1.0 – 4.5
31 – 35 Weeks, Day 4:	57 – 410	1.1 – 5.2
<b>FULL-TERM INFANTS</b>		
3 Days:	31 – 546	2.6 – 5.3
31 Days – 11 Months:	5 – 220	2.3 – 6.0
<b>CHILDREN</b>		
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
<b>ADULTS</b>		
	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**

&lt; 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
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**PREPUBERTAL CHILDREN**

1 – 10 Years:	3 – 90
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**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)**

27 – 199

**FEMALE RANGE (ng/dL)**

Follicular: 15 – 70  
Luteal: 35 – 290

**ICA-512 Autoantibodies**

BLOOD ASSAYS

**500255 (E)****141531 (L)****RANGE****ALL AGES**

&lt; 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)**

	<b>RANGE (ng/mL)</b>	<b>MEAN</b>
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)**

	<b>RANGE (mg/L)</b>	<b>MEAN (mg/L)</b>
<b>PREMATURE INFANTS</b>		
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
<b>FULL-TERM INFANTS</b>		
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
<b>CHILDREN</b>		
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
<b>ADULTS</b>		
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
<b>NEWBORNS AND INFANTS</b>				
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
<b>CHILDREN AND YOUNG ADULTS</b>				
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
<b>ADULTS</b>				
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

**IGF-II**

BLOOD ASSAYS

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

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

**Insulin**

BLOOD ASSAYS

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

	<b>RANGE (uU/mL)*</b>
<b>PREPUBERTAL</b>	
0 – 8 Years:	0 – 13
<b>PUBERTAL CHILDREN AND ADULTS</b>	
	0 – 17
<b>ADULTS</b>	
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: &lt; 5.0

**ADULTS**

20 – 40 Years: &lt; 5.0

**TYPE I DIABETES**

5 – 420

**Insulin, Free and Total**

BLOOD ASSAYS

**500226 (E)****501561 (L)****NON-DIABETIC****RANGE (uU/mL)**

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)**

	<b>RANGE (mg/24 hours)</b>	<b>RANGE (mg/g creatinine)</b>
<b>CHILDREN</b>		
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
<b>ADULTS</b>		
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 AGE STAGE	(years)	RANGE (mIU/mL)	MEAN (mIU/mL)	TANNER AGE STAGE	(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**

&lt; 50%

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

**Metanephrines, Fractionated Urine (Includes Creatinine)** URINE ASSAYS**500240 (E)****501533 (L)**

	<b>RANGE (ug/24 hours)</b>	<b>RANGE (ug/g creatinine)</b>
<b><u>NORMETANEPHRINE</u></b>		
<b>CHILDREN</b>		
< 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
<b>ADULTS</b>	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)**

	<b>RANGE</b> <b>(ug/24 hours)</b>	<b>RANGE</b> <b>(ug/g creatinine)</b>
<b>CHILDREN</b>		
< 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
<b>ADULTS</b>	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:

&lt; 15

24 Hour Collection:

&lt; 25

&lt; 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)**

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

&lt;10 – 15

Adults

&lt;10 – 11

**FEMALES****RANGE**

1 – 10 Years

&lt;10 – 26

11 Years

&lt;10 – 255

12 Years

&lt;10 – 856

13 Years

&lt;10 – 693

14 Years

&lt;10 – 1204

15 Years

&lt;10 – 1076

16 Years

&lt;10 – 1294

**ADULT****CYCLE DAYS****RANGE**

1 – 6

&lt;10 – 17

7 – 12

&lt;10 – 135

13 – 15

&lt;10 – 1563

16 – 28

&lt;10 – 2555

**POST MENOPAUSAL**

&lt;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)**

	<b>PROINSULIN RANGE (pM/L)</b>	<b>PROINSULIN/INSULIN* (Molar Ratio As %) RANGE</b>
<b>NORMAL CHILDREN</b>		
Fasting:	1.8 – 10	6.4 – 16
<b>NORMAL ADULTS</b>		
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)**

	<b>RANGE (ng/mL)</b>
<b>NEWBORN</b>	
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.
<b>CHILDREN AND ADULTS</b>	
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)**

20 – 160

**UPRIGHT****RANGE (ng/dL/hr)**

70 – 330

**ADULTS\*\***

\* 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: &lt; 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)**

	<b>MALE RANGE (pg/mL)</b>	<b>FEMALE RANGE (pg/mL)</b>
<b>FULL-TERM INFANTS</b>		
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**

	<b>MALE RANGE (%)</b>	<b>FEMALE RANGE (%)</b>
<b>FULL-TERM INFANTS</b>		
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:

&lt; 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)**

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

Assay quantification limit: &lt;0.1

**THYROGLOBULIN RIA**  
**INFANTS**

1 – 12 Months	12 – 113	42
<b>PREPUBERTAL CHILDREN</b>	5 – 72	29
<b>PUBERTAL CHILDREN AND ADULTS</b>	< 3 – 39	16

Assay quantification limit: &lt;2.0

**Thyroglobulin Antibodies (Anti-Tg)**

BLOOD ASSAYS

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

	<b>RANGE (IU/mL)</b>
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)****ALL AGES****RANGE (IU/mL)**

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:  
Newborns:

1.3 – 16

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 (&gt;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

&lt;1 U/L = Negative

1.1 - 1.5 U/L = Equivocal

&gt;1.5 U/L = Positive

**Vanillylmandelic Acid (VMA), Urine (Includes Creatinine)** URINE ASSAYS**500330 (E)****500496 (L)**

	<b>RANGE (mg/24 hours)</b>	<b>RANGE (mg/g creatinine)</b>
<b>CHILDREN</b>		
Birth – 11 Months:	Not Determined	3 – 17
12 – 23 Months:	Not Determined	4 – 12
24 Months – 14 Years:	Not Determined	2 – 11
<b>ADULTS</b>	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)**

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

<b>HORMONE</b>	<b>WHEN YOU KNOW</b>	<b>MULTIPLY BY</b>	<b>TO FIND</b>
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
Triiodothyronine (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

<b>HORMONE</b>	<b>WHEN YOU KNOW</b>	<b>MULTIPLY BY</b>	<b>TO FIND</b>
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

<b>HORMONE</b>	<b>WHEN YOU KNOW</b>	<b>MULTIPLY BY</b>	<b>TO FIND</b>
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

<b>HORMONE</b>	<b>WHEN YOU KNOW</b>	<b>MULTIPLY BY</b>	<b>TO FIND</b>
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

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
Triiodothyronine (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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