A Patient Sample Report

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Advanced Urinary Hormone Testing

Female 24-hour Urine Comprehensive Hormone

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Patient Information	Clinician/Order Information	Sample Information
Jane Doe **DOB: 6/13/1943** **Age: 76** Gender: Female Phone: 877-316-8686 Patient ID: PhyL12345 Height: 5'0" Weight: 120lbs	**Tamara Densmore, MD** Physicians Lab Order date: 9/24/2019	**Accession # 19-0000025** Collected: 10/08/2019 Received: 10/11/2019 Reported: 10/18/2019 Collection times: 1st 10:00 AM, 2nd 2:00 PM, 3rd 6:00 PM, 4th 10:00 PM, 5th 6:00 AM

1st Day of Last Menses	Days Between Periods	Menstrual Cycles	Hysterectomy	When?	Ovaries Removed	When?	Pregnant?
N/A	N/A	Still Cycling/No Periods	Yes	1987	Yes	1987	No

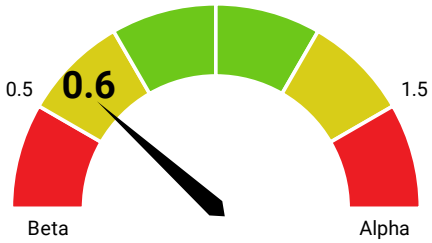
Category	Type	Delivery	Duration of Use
Hormone	Testosterone	Cream/Gel	12+ Months
	Progesterone	Cream/Gel	12+ Months
	Estradiol	Cream/Gel	12+ Months

Creatinine *Dilution Factor Value – Does not indicate Creatinine Clearance or Renal Function*	mg/dL		

Estrogen & Progesterone Markers

	Units	Observation	Target Ranges
Alpha-Pregnanediol (5a-P2)	ng/mg CR	Low	
Beta-Pregnanediol (5b-P2)	ng/mg CR		

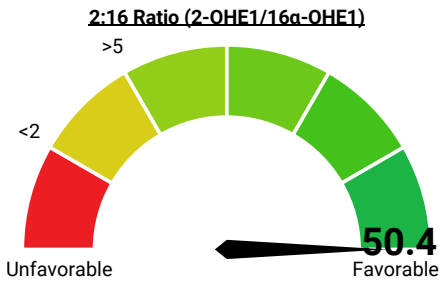
Alpha-Pregnanediol / Beta-Pregnanediol Ratio



The amount of 5α-pregnanediol, relative to 5β-pregnanediol is normal. The most optimal ratio is 1. Patients at the high or low ends of normal (yellow zones) are approaching an imbalance and may be modified by either increasing (at the low end) or decreasing (at the high end) 5α-reductase activity.

Estrogen & Progesterone Markers Continued

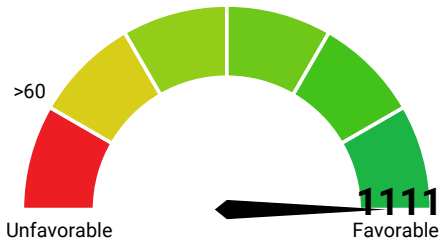
	Units	Observation	Target Ranges
Total Estrogen Load	ng/mg CR	Low	9.3 (30 – 130)
Estrone (E1)	ng/mg CR	Below Detection Limit	(1.7 – 8.5)
Estradiol (E2)	ng/mg CR	Low	0.1 (0.8 – 3.3)
Estriol (E3)	ng/mg CR		3.8 (2.8 – 11.2)
2-Hydroxyestrone (2-OHE1)	ng/mg CR		3.8 (2 – 8.4)
16a-Hydroxyestrone (16a-OHE1)	ng/mg CR		0.1 (< 3.8)
4-Hydroxyestrone (4-OHE1)	ng/mg CR	Elevated	1.3 (< 1.2)
2-Methoxyestrone (2-oMeE1)	ng/mg CR		41.9 (3.1 – 15.8)



The 2:16 Ratio is favorable. This means that Phase I is preferentially metabolizing down the 2-OHE1 pathway which is most favorable. Review the methylation ratio to determine that Phase I metabolites are detoxing at the the minimal rates expected.

Estrogen & Progesterone Markers Continued

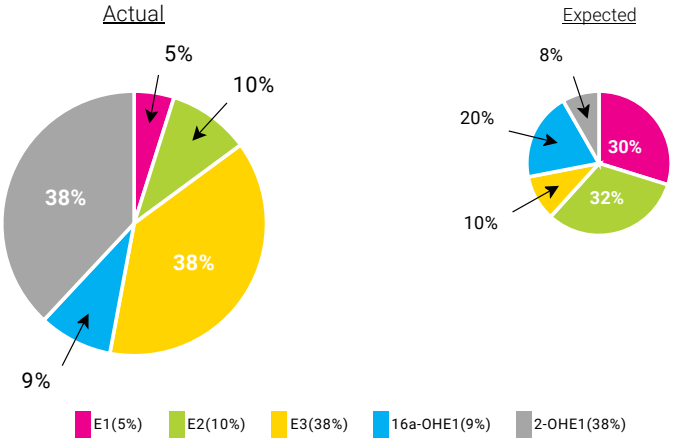
Methylation Ratio



The Methylation Ratio is favorable. This means that the Phase I hydroxyestrones are methylating to Phase II methoxyestrones at a rate that is expected or more favorable than expected.

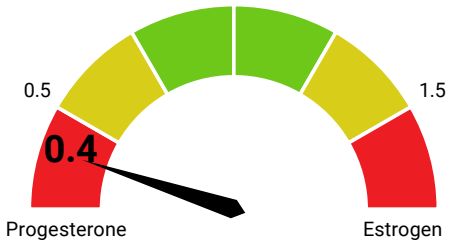
Total Estrogen Load

weighted by binding affinities



The patient has a low Total Estrogen Load and a normal 2:16 ratio. To examine the balance between total estrogen components, compare the “actual” chart on the left to the “expected” chart on the right representing the pathways of estrogen metabolism and their relative ratio to one another. The Total Estrogen Load considers the binding affinity of each estrogen analyte at the receptor. Next, examine the Progesterone: Estrogen ratio to determine the balance between estrogen and progesterone for the best clinical outcomes.

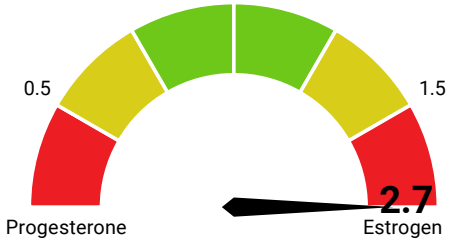
Total Estrogen/Progesterone Ratio



Only review this ratio when the patient is NOT taking oral progesterone. Relative to total estrogen levels, this patient is progesterone dominant/estrogen deficient. This can be a result of either too little estrogen or too much opposing progesterone. Achieving balance between estrogen and progesterone (ratio nearest 1) produces optimal clinical outcomes in most patients.

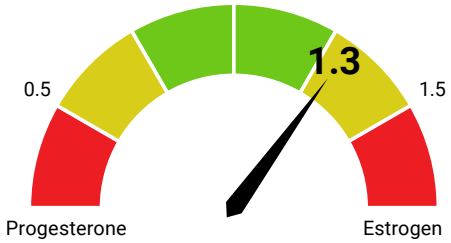
Estrogen & Progesterone Markers Continued

Total Estrogen/Progesterone Ratio (w/ Oral Pg)



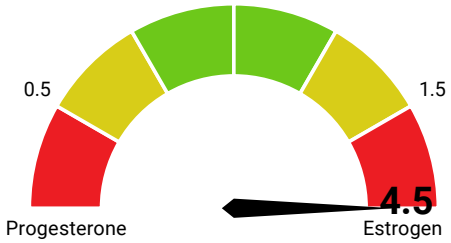
Only review this ratio when the patient took oral progesterone 12-16 hours before urine collection. Relative to total progesterone levels, this patient is estrogen dominant. This can be a result of either too much estrogen or too little opposing progesterone. Achieving balance between estrogen and progesterone (ratio nearest 1) produces optimal clinical outcomes in most patients.

Total Estrogen/Progesterone (Skipped)



Only review this ratio when the patient is taking oral progesterone AND skipped the progesterone dose the day before urine collection. Estrogen and progesterone are in balance. Patients with a value of 1 are optimally balanced, >1 are balanced with a slight increase in estrogen and <1 are balanced with a slight increase in progesterone. Maintaining balance produces optimal outcomes in most patients. Patients at the high or low ends of normal (yellow zones) are approaching an imbalance and can be improved by increasing/decreasing either estrogen or progesterone relative to one another.

Total Estrogen/Progesterone (Bed)

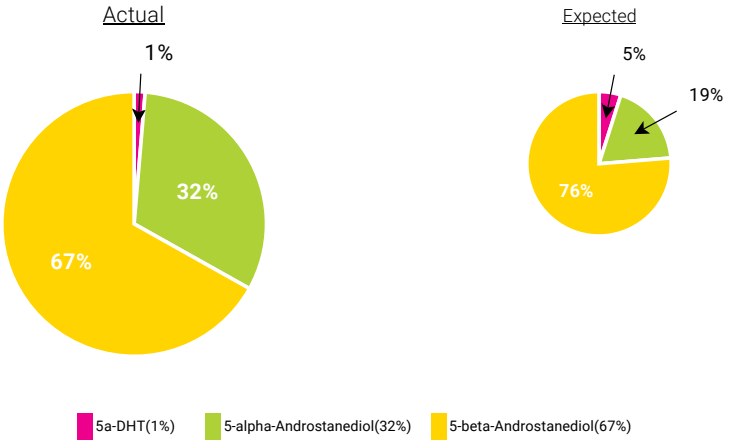


Only review this ratio when the patient took oral progesterone, at bedtime, the night before urine collection. Relative to total progesterone levels, this patient is estrogen dominant. This can be a result of either too much estrogen or too little opposing progesterone. Achieving balance between estrogen and progesterone (ratio nearest 1) produces optimal clinical outcomes in most patients.

Androgen Markers

	Units	Observation	Target Ranges
Testosterone	ng/mg CR	Low	2.3 – 7.8 (1.0)
Dihydrotestosterone (5a-DHT)	ng/mg CR	Below Detection Limit	< 3.2
Testosterone Metabolites *5a-DHT + 5a-Androstanediol + 5b-Androstanediol*	ng/mg CR	Low	21.9 – 70.1 (18.1)

Total Testosterone Metabolites



The level of Total Testosterone Metabolites is low and may be caused by decreased 5-alpha-reductase activity, low metabolism of testosterone, aromatase activity or low testosterone levels. To determine the cause, it is important to examine the balance between testosterone and the testosterone metabolites and review the Testosterone/Metabolite Ratio to assess this balance. The individual levels of metabolites displayed in this graph represent the amount of each metabolite measured in relative ratio to one another and should be compared to the expected graph to trace pathway alterations that can occur during metabolism.

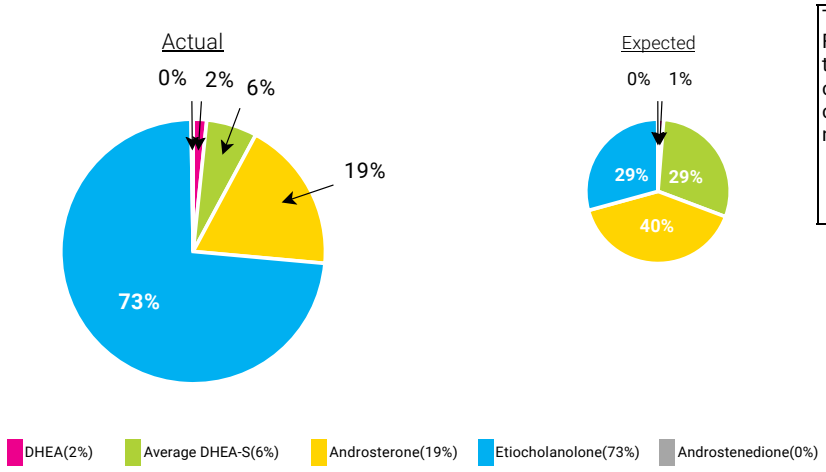
Testosterone/Metabolite Ratio

This ratio indicates that the levels of expected testosterone metabolites are normal in relative ratio to testosterone. Although there is balance between testosterone and its downstream metabolites, please review testosterone and the testosterone metabolites individually to make certain that their individual levels are optimal and in expected balance with one another (see Total Testosterone Metabolite graph) when making therapeutic decisions. The most optimal ratio is 1 (center green). Patients at the high or low ends of normal (yellow) are approaching an imbalance.

Androgen Markers Continued

	Units	Observation	Target Ranges
Average DHEA-S	ng/mg CR	Low	38 – 507 (6.0)
DHEA Total	ng/mg CR	Low	649 – 1315 (97.0)

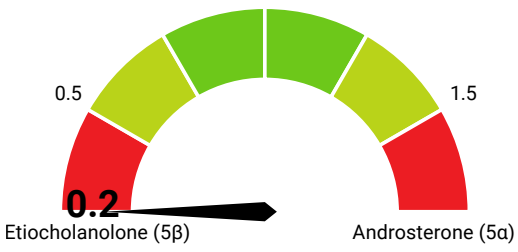
Total DHEA



The level of Total DHEA is low. Total DHEA includes Free-DHEA, DHEA-S and DHEA metabolites. To examine the balance between these components of Total DHEA, compare the “actual” chart on the left to the “expected” chart on the right to determine when alterations in metabolism of DHEA may occur.

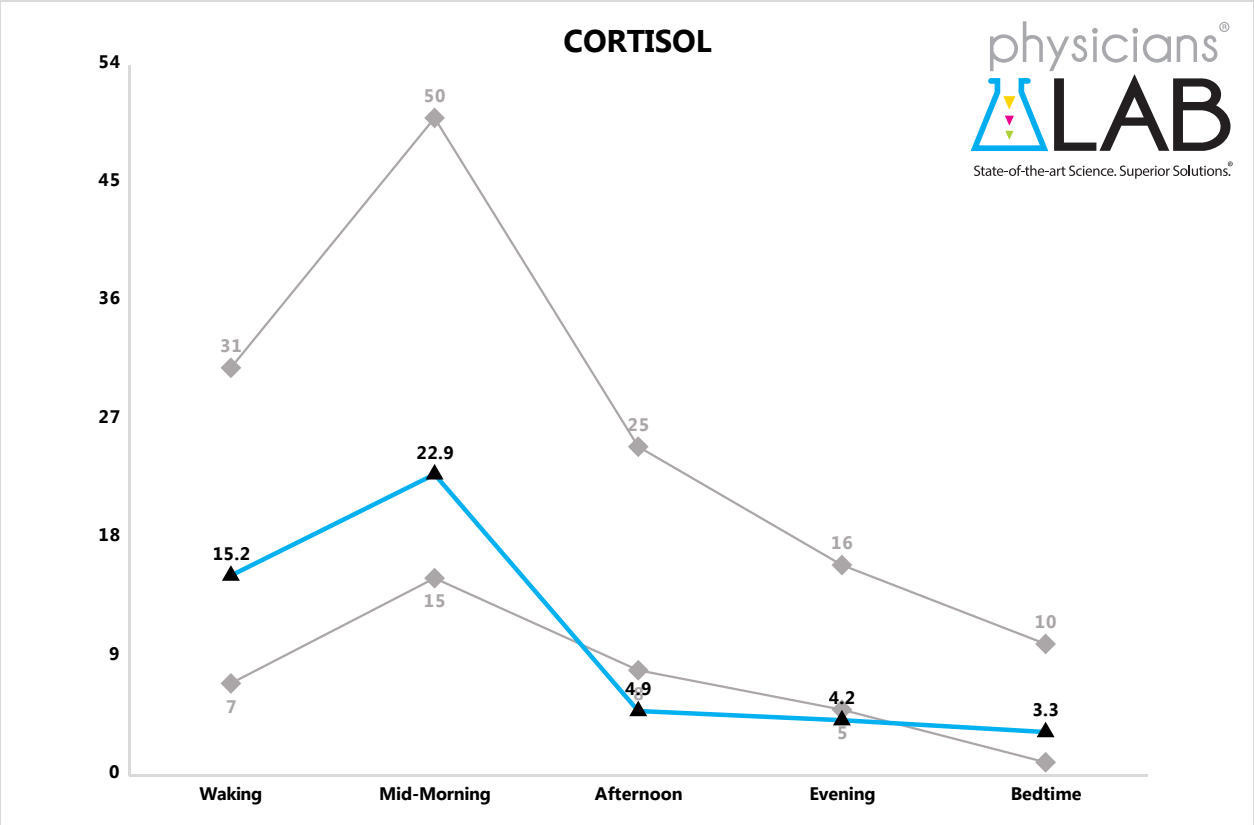
	Units	Observation	Target Ranges
Etiocholanolone	ng/mg CR	Low	120 – 421 (71)
Androsterone	ng/mg CR	Low	147 – 593 (18.0)

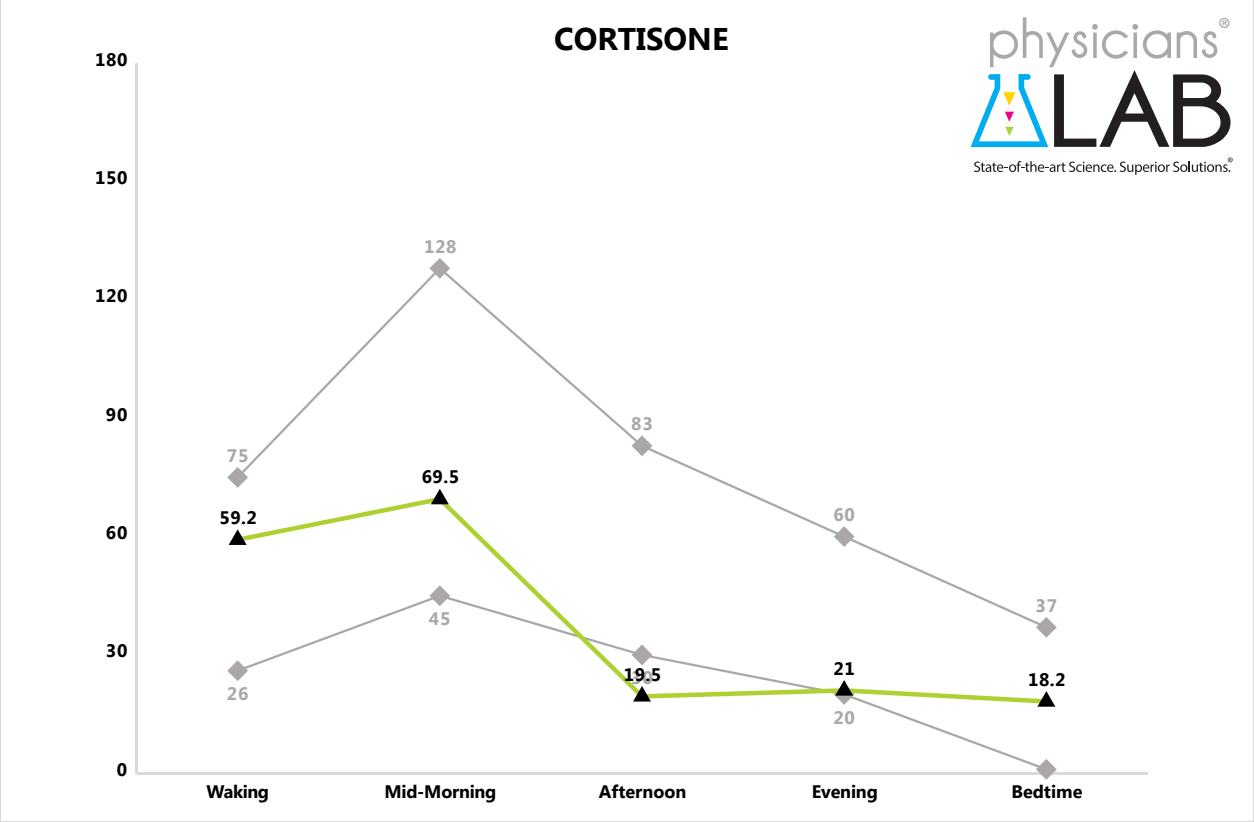
5α-Reductase Activity



This patient has low 5aR activity which is measured by comparing the relative ratios of androsterone (an alpha pathway) to etiocholanolone (a beta pathway). Optimal balance exists when the ratio is nearest 1 (center). 5-Alpha-Reductase is an enzyme that converts Testosterone to 5a-DHT, Progesterone to 5a-Pregnanediol, Cortisol to a-THF, DHEA to Androsterone metabolites and many other conversions. 5-alpha-reductase also plays a role in Aromatase activity (usually an inverted relationship). Patients who have lower 5aR activity (5aR ratio < = 0.5) may need a higher dose of testosterone during therapy if testosterone metabolites are also low. Additionally, patients with low 5aR activity could experience higher levels of aromatase activity, lower 5a-Pregnanediol or lower levels of the downstream metabolites of testosterone and cortisol (see these metabolite ratios).

HPA-Axis Graphs

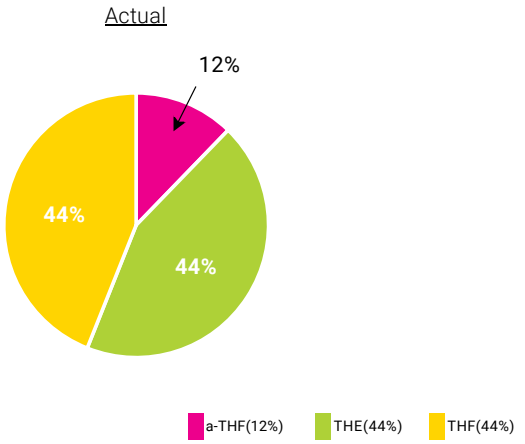




HPA-Axis Markers

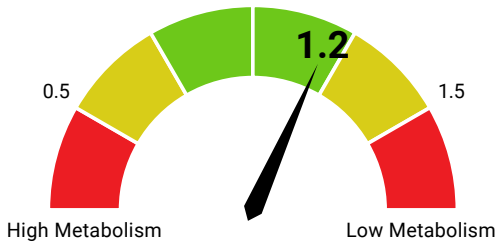
	Units	Observation	Target Ranges
Cortisol Metabolites *a-THF + THE + THF*	ng/mg CR	Elevated	1160 – 2183 (2262)

Total Cortisol Metabolites



Although Cortisol Metabolites are higher than expected due to increased cortisol levels, the metabolites are in balance with free-cortisol levels. See Cortisol:Metabolite Ratio.

Cortisol/Metabolite Ratio



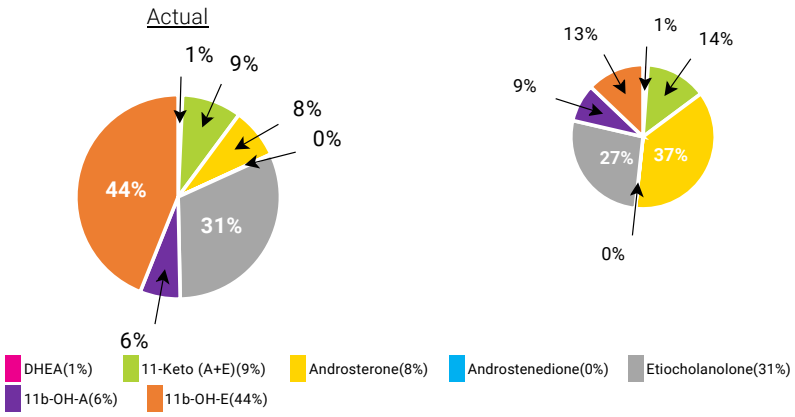
The Cortisol:Metabolite Ratio is normal. This means that the levels of free cortisol can be taken at face value because the rate of cortisol metabolism is balanced with the amount of free-cortisol. (see the cortisol curve to assess adrenal function). Based on these results, the patient likely has elevated adrenal function resulting in elevated cortisol. Certain 17-Hydroxystroids are also cortisol metabolites, and as such, should be in balance with 17-Ketosteroids for optimal function (see Anabolic/Catabolic ratio)

	Units	Observation	Target Ranges
DHEA Total	ng/mg CR	Low	649 – 1315 (97.0)
Total 17-Ketosteroids *11-Keto (A+E) + Androsterone + Etiocholanolone + 11b-OH-A + 11b-OH-E + DHEA*	ng/mg CR	Low	730 – 1522 (225.9)
Total 17-Hydroxysteroids *Pregnanetriol + a-THF + THS + THE + THF*	ng/mg CR	Elevated	1492 – 2637 (2655)

HPA-Axis Markers Continued

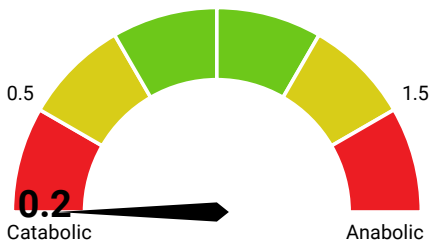
Total 17-Ketosteroids

Anabolic



This patient's 17-ketosteroids are low. Decreases in 17-ketosteroids can be the result of low DHEA levels, hyperthyroidism, depressed adrenal function, kidney issues, hypopituitarism or decreased testicular function. 17-ketosteroids are formed during metabolism of androgenic sex hormones (specifically DHEA) and are released by the adrenal glands (M/F) and the testes (M). To examine the balance between the 17-ketosteroids, compare the "actual" chart on the left to the "expected" chart on the right representing the relative ratios of each. 17-ketosteroids should also be in balance with 17-hydroxysteroids to achieve optimal clinical results (see anabolic/catabolic ratio).

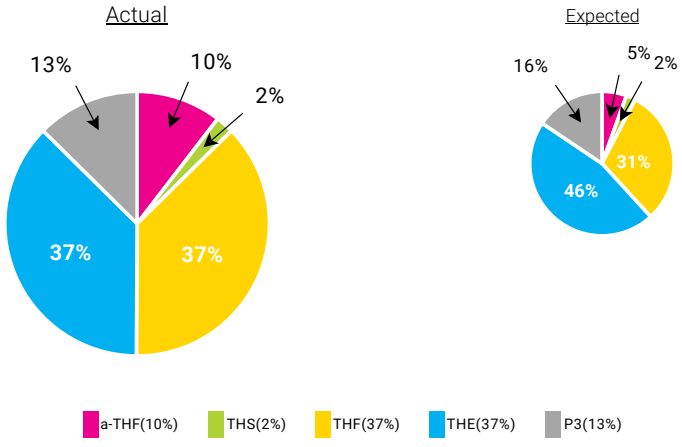
Anabolic/Catabolic Ratio



The proper balance between anabolic hormones and catabolic hormones is essential in creating a bio-environment for cell proliferations and tissue health to perform at optimal levels while still allowing for detoxification and responses to stress. The result shown indicate higher catabolic metabolites. This can be due to elevated cortisol and cortisol metabolites (see causes of elevated 17-Hydroxysteroids) or low DHEA and DHEA metabolites (see causes of decreased 17-Ketosteroids). Possible causes include chronic stress, obesity, metabolic syndrome, excessive wear and tear or poor recovery from illness or injury.

Total 17-Hydroxysteroids

Catabolic



The proper balance between anabolic hormones and catabolic hormones is essential in creating a bio-environment for cell proliferations and tissue health to perform at optimal levels while still allowing for detoxification and responses to stress. The result shown higher anabolic metabolites. This can be due to lower cortisol and cortisol metabolites (see causes for decreased 17-Hydroxysteroids) or elevated DHEA and DHEA metabolites (see causes for elevated 17-Ketosteroids). Possible causes include androgen therapy, high DHEA levels, hypothyroidism, elevated adrenal function, imbalances of sex hormones and other adrenal issues.

Patient Result History

Analyte	Unit	10/18/2019 | (19-0000025)		Reference Ranges
		Observation	Results	
Creatinine	mg/dL		**133.7**	35 - 300
Estrogen and Progesterone Markers				
Alpha-Pregnanediol (5a-P2)	ng/mg CR	**Low**	**31.0**	35 - 656
Beta-Pregnanediol (5b-P2)	ng/mg CR		**252.7**	160 - 2775
Alpha-Pregnanediol / Beta-Pregnanediol Ratio	Ratio	**Balanced**	**0.6**	0.5 - 1.5
Total Estrogen Load	ng/mg CR	**Low**	**9.3**	30 - 130
Estrone (E1)	ng/mg CR	**Below Detection Limit**	**-**	1.7 - 8.5
Estradiol (E2)	ng/mg CR	**Low**	**0.1**	0.8 - 3.3
Estriol (E3)	ng/mg CR		**3.8**	2.8 - 11.2
2-Hydroxyestrone (2-OHE1)	ng/mg CR		**3.8**	2 - 8.4
16a-Hydroxyestrone (16a-OHE1)	ng/mg CR		**0.1**	<=3.8
4-Hydroxyestrone (4-OHE1)	ng/mg CR	**Elevated**	**1.3**	<=1.2
E Quotient (EQ)	Ratio	**Favorable**	**25.7**	>=1
2-Methoxyestrone (2-oMeE1)	ng/mg CR		**41.9**	3.1 - 15.8
2:16 Ratio (2-OHE1/16α-OHE1)	Ratio	**Favorable**	**50.4**	>=4
Methylation Ratio	Ratio	**Favorable**	**1111**	>=60
Total Estrogen/Progesterone Ratio	Ratio	**Imbalanced**	**0.4**	0.5 - 1.5
Total Estrogen/Progesterone Ratio (w/ Oral Pg)	Ratio	**Imbalanced**	**2.7**	0.5 - 1.5
Total Estrogen/Progesterone Ratio (Skipped)	Ratio	**Balanced**	**1.3**	0.5 - 1.5
Total Estrogen/Progesterone Ratio (Bed)	Ratio	**Imbalanced**	**4.5**	0.5 - 1.5
Androgen Markers				
Testosterone	ng/mg CR	**Low**	**1.0**	2.3 - 7.8
Dihydrotestosterone (5a-DHT)	ng/mg CR	**Below Detection Limit**	**-**	<=3.2
Testosterone Metabolites	ng/mg CR	**Low**	**18.1**	21.9 - 70.1
Testosterone/Metabolite Ratio	Ratio	**Balanced**	**0.5**	0.5 - 1.5
Androsterone	ng/mg CR	**Low**	**18.0**	147 - 593
Etiocholanolone	ng/mg CR	**Low**	**71**	120 - 421
5-alpha-Androstanediol	ng/mg CR		**5.8**	2.8 - 14.2
5-beta-Androstanediol	ng/mg CR	**Low**	**12.2**	14 - 54
DHEA	ng/mg CR	**Low**	**1.6**	6.1 - 17.3
Average DHEA-S	ng/mg CR	**Low**	**6.0**	38 - 507
DHEA Total	ng/mg CR	**Low**	**97.0**	649 - 1315
5α-Reductase Activity (5aR)	Ratio	**Decreased 5aR**	**0.2**	0.5 - 1.5
Androstenedione	ng/mg CR	**Below Detection Limit**	**-**	0 - 1.2
HPA - Axis Markers				
Waking Cortisol	ng/mg CR		**15.2**	7 - 31
Mid-morning Cortisol	ng/mg CR		**22.9**	15 - 50
Afternoon Cortisol	ng/mg CR	**Low**	**4.9**	8 - 25
Evening Cortisol	ng/mg CR	**Low**	**4.2**	5 - 16
Bedtime Cortisol	ng/mg CR		**3.3**	1 - 10
Waking Cortisone	ng/mg CR		**59.2**	26 - 75
Mid-morning Cortisone	ng/mg CR		**69.5**	45 - 128
Afternoon Cortisone	ng/mg CR	**Low**	**19.5**	30 - 83
Evening Cortisone	ng/mg CR		**21.0**	20 - 60
Bedtime Cortisone	ng/mg CR		**18.2**	1 - 37
Pregnanetriol (P3)	ng/mg CR		**334.4**	170 - 423
Allo-Tetrahydrocortisol (a-THF)	ng/mg CR	**Elevated**	**276.9**	53 - 155
Tetrahydrodeoxycortisol (THS)	ng/mg CR	**Elevated**	**58.2**	23 - 58
Tetrahydrocortisone (THE)	ng/mg CR		**990.5**	564 - 1194
Tetrahydrocortisol (THF)	ng/mg CR	**Elevated**	**994.6**	369 - 795
11-Keto (Androsterone + Etiocholanolone) (11-Keto (A+E))	ng/mg CR	**Low**	**21.3**	62 - 213
11b-Hydroxyandrosterone (11b-OH-A)	ng/mg CR	**Low**	**14.4**	36 - 134
11b-Hydroxyetiocholanolone (11b-OH-E)	ng/mg CR		**99.2**	57 - 202
Cortisol Metabolites	ng/mg CR	**Elevated**	**2262**	1160 - 2183
Cortisol: Metabolite Ratio	Ratio	**Balanced**	**1.2**	0.5 - 1.5
Total 17-Ketosteroids	ng/mg CR	**Low**	**225.9**	730 - 1522
Total 17-Hydroxysteroids	ng/mg CR	**Elevated**	**2655**	1492 - 2637
Anabolic/Catabolic Ratio	Ratio	**Imbalanced**	**0.2**	0.5 - 1.5

Patient Symptoms

Disclaimer: This chart below indicates each patient reported symptom and the severity of each symptom reported by the patient. The symptoms are grouped into categories that could be causing the symptom to assist the physician in identifying the highest probable conditions. This chart is only based on patient reported symptoms from the patient questionnaire and does not diagnose a condition but can be used as a tool in the diagnosis process within the ordering physicians' protocol.

KEY

Results and/or symptoms indicate probability of condition

LOW | MODERATE | HIGH

Symptom Categories	Results | October 18, 2019
Metabolic Syndrome	22%
Hyper-Thyroidism	28%
Hypo-Thyroidism	29%
High Cortisol	36%
Low Cortisol	36%
High Androgens	15%
Low Androgens	71%
Estrogen Dominance or Progesterone Deficiency	23%
Estrogen Deficiency or Progesterone Dominance	48%

KEY

MILD | MODERATE | SEVERE

Patient answered Mild/Sometimes for symptom | Patient answered Moderate/Often for symptom | Patient answered Severe/Always for symptom

	Symptom Categories								
Symptoms	*Metabolic Syndrome*	*Hyper-Thyroidism*	*Hypo-Thyroidism*	*High Cortisol*	*Low Cortisol*	*High Androgens*	*Low Androgens*	*Estrogen Dominance or Progesterone Deficiency*	*Estrogen Deficiency or Progesterone Dominance*
Aches, pains, joint pain and/or cramps	●			●	●	●	●	●	●
Allergies, including asthma, hives, rashes, sinus congestion and food sensitivities		●			●		●	●	●
Anxiety/ Nervousness			●	●	●			●	●
Cold hands and feet or sensitivity to cold			●	●	●		●	●	
Decreased sex drive				●	●		●	●	●
Depression, lessened mood			●	●	●		●	●	●
Difficulty falling asleep, staying asleep or insomnia	●	●		●	●			●	●
Diminished muscle mass and strength				●	●		●		●
Dry eyes, dry skin, dry hair or vaginal dryness			●		●		●	●	●
Fatigue, decreased energy or sedated/lethargic feeling		●	●	●	●		●	●	●
Hair Loss/ Hair thinning/ Balding (Head)		●	●	●		●		●	
Headaches and/or Migraines			●				●	●	●
High blood pressure	●			●		●			
High cholesterol	●		●						
Hot flashes	●		●	●					●
Inability to handle stress/high stress	●		●		●				
Increased sex drive	●			●		●			
Increased sweating/night sweats		●	●	●					●

Patient: Jane Doe **Accession # 19-0000025**

Symptoms	Symptom Categories								
	Metabolic Syndrome	*Hyper-Thyroidism*	*Hypo-Thyroidism*	*High Cortisol*	*Low Cortisol*	*High Androgens*	*Low Androgens*	*Estrogen Dominance or Progesterone Deficiency*	*Estrogen Deficiency or Progesterone Dominance*
Irritability		●		●	●			●	●
Memory loss/forgetfulness/mental fogginess/decreased concentration	●	●		●	●		●	●	●
Mood swings/mood changes						●		●	●
Muscle wasting or weakness		●		●			●		
Not feeling like yourself, lessened well-being or self-image							●		●
Osteoporosis or weakened bone strength				●			●		●
Rapid Aging				●			●		●
Rapid heartbeat, with or without anxiety		●	●		●				●
Waking up groggy or on edge / difficulty waking			●		●		●		●
Water retention, bloating, puffiness				●				●	●

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