dutchplus®

Ordering Provider:
Precision Analytical

PATIENT INFORMATION

Teresa, Burnout
123 A Street
Sometown , CA 90266

DOB: 1983-01-01
Age: 42
Sex: Female
Last Menstrual Period: 2004-02-01

Case # 1

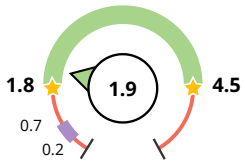
Collection Dates:
2025-10-09 (S1 S2 S3 SX S4 S5 U1 U2 U3 U4)

Hormone Testing Summary

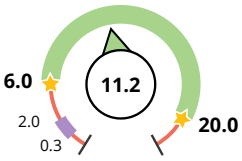
Optimal Luteal Range | Postmenopausal Range | Out of Range | Edge of Range

For an expanded view of results, see pages 2 through 6. For interpretive support, see *About Your Results* pages.

ESTROGEN & PROGESTERONE PRODUCTION



Estradiol (E2)



Progesterone (P4)
Serum Equivalent*, ng/mL

*P4 Serum Equivalent (ng/mL) is a calculated value based on urine pregnanediol.

ESTROGEN METABOLISM

2-OH / 16-OH-E1 Balance

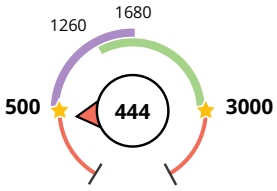
2-OH / 4-OH-E1 Balance

Phase 1 Metabolism

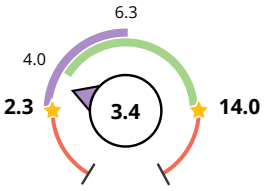
Methylation Activity
2-Methoxy / 2-OH-E1

Phase 2 Methylation

ANDROGEN PRODUCTION

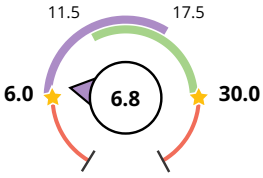


Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone



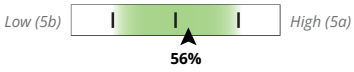
Testosterone

ANDROGEN METABOLISM

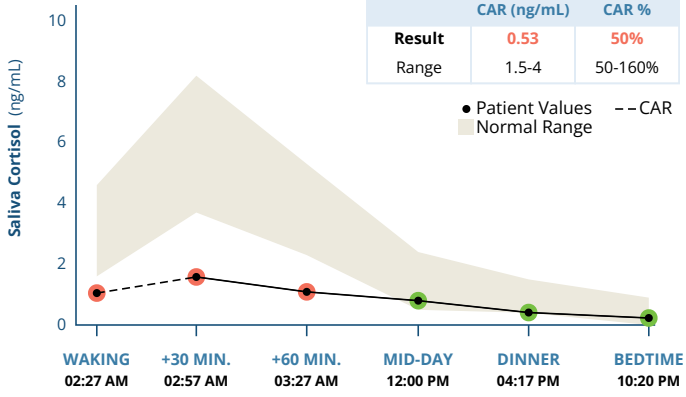


5a-Androstanediol
Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone



FREE CORTISOL with CORTISOL AWAKENING RESPONSE (CAR)



	CAR (ng/mL)	CAR %
Result	0.53	50%
Range	1.5-4	50-160%

● Patient Values – – CAR
Normal Range

CORTISOL METABOLISM

Cortisol Clearance Rate
THF + THE / Cortisol + Cortisone

Cortisol Metabolism

Saliva Cortisol Total
Sum of S1 - 5

Metabolized Cortisol
Total Cortisol Production (THF + THE)

Organic Acid Tests (OATs) Suggests the Following Possible Imbalances | see page 6 for details

Watch | Needs Attention

B12 Deficiency | B6 Deficiency | Biotin Deficiency | Neurotransmitters | Melatonin

EXPANDED ESTROGEN, PROGESTERONE, & ANDROGENS

Optimal Luteal Range | Postmenopausal Range | Out of Range | Edge of Range

Androgens

Pregnenolone

Total DHEA Production: 444 (500 – 3000; 1260 – 1680)
DHEA-S: 9 (20 – 750; 60 – 270)
Testosterone: 3.4 (2.3 – 14.0; 4.0 – 6.3)
Androstenedione
Etiocholanolone: 188 (200 – 1000; 470 – 710)
Androsterone: 247 (200 – 1650; 600 – 830)
5b-Androstanediol: 11 (12 – 75; 30 – 55)
5a-Androstanediol: 6.8 (6.0 – 30.0; 11.5 – 17.5)
Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b) — High (5a)
56%

Progesterone

This result is a weighted average of two progesterone metabolites (below). Progesterone is measured indirectly in urine.

Progesterone (P4)
b-Pregnanediol: 1096 (600 – 2000; 200 – 60)
a-Pregnanediol: 314 (200 – 740; 50 – 15)

5a-Metabolism (P4)
a-Pregnanediol / b-Pregnanediol
Low (5b) — High (5a)
28%

Primary Estrogens

Estrone (E1): 12.6 (12 – 26; 7.0 – 1.0)
Estradiol (E2): 1.9 (1.8 – 4.5; 0.7 – 0.2)
Estriol (E3): 4.0 (5 – 18; 4.0 – 0.6)
17b-HSD
CYP3A4
CYP1A1 (protective)
CYP1B1

Phase 1 Estrogen Metabolism

2-OH-E1: 9.2 (5.1 – 13.1; 2.0 – 0.3)
4-OH-E1: 1.2 (0.3 – 1.8; 0.0)
16-OH-E1: 0.7 (0.7 – 2.6; 0.6 – 0.2)

Methylation, Glutathione Detox
QUINONE (reactive)
If not detoxified, 4-OH-E1 can bind to and damage DNA

COMT Methylation

Phase 2 Estrogen Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1
Low — High
4%

2-Methoxy-E1: 2.5 (2.5 – 6.5; 1.4 – 0.3)

2-OH / 16-OH-E1 Balance
16-OH-E1 — 2-OH-E1
83%

2-OH / 4-OH-E1 Balance
4-OH-E1 — 2-OH-E1
38%

The Phase 1 Estrogen Metabolism Pie Chart has been replaced by the 2-OH/16-OH-E1 and 2-OH/4-OH-E1 slider bars (left). See this video for an explanation with examples. This change aligns the DUTCH report best with published scientific research. See our recent publication in Menopause.

dutchplus®

Case # 1
Teresa, Burnout
123 A Street
Sometown , CA 90266
DOB: 1983-01-01
Age: 42
Sex: Female
Last Menstrual Period:
2004-02-01

Collection Times:
2025-10-09 02:27AM (S1)
2025-10-09 02:57AM (S2)
2025-10-09 03:27AM (S3)
2025-10-09 12:00PM (SX)
2025-10-09 04:17PM (S4)
2025-10-09 10:20PM (S5)
2025-10-09 02:29AM (U1)
2025-10-09 04:40AM (U2)
2025-10-09 04:20PM (U3)
2025-10-09 10:28PM (U4)

Ordering Provider:

Precision Analytical

Sex Hormones & Metabolites

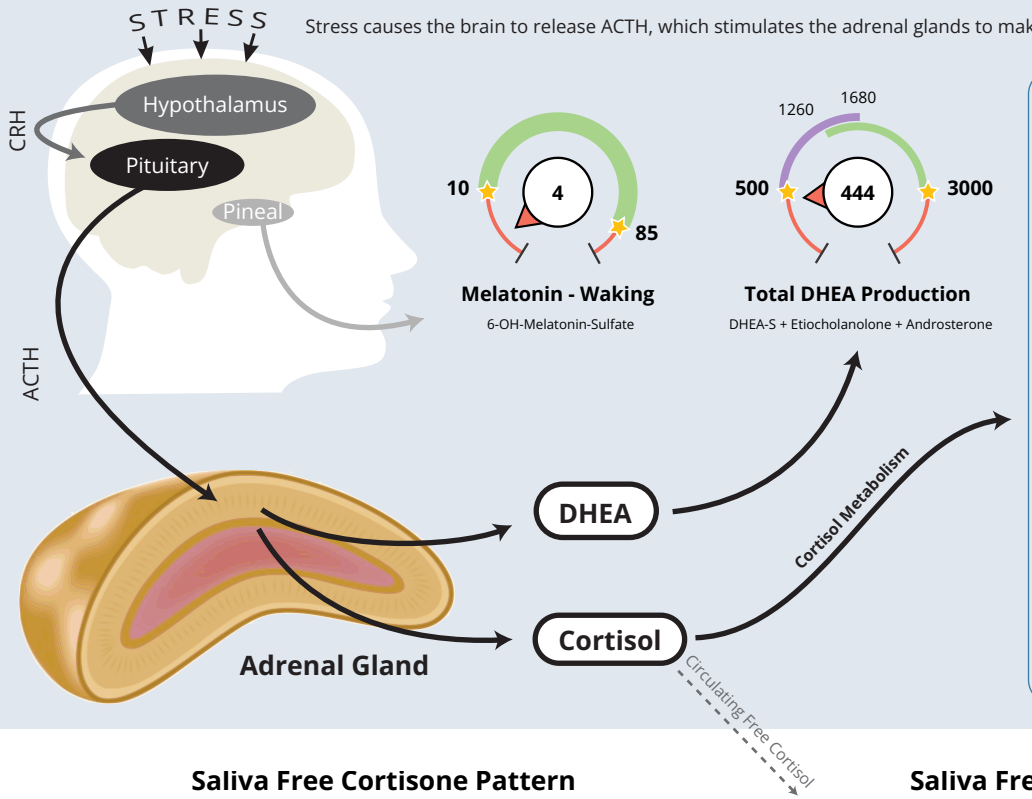
TEST		RESULT	UNITS	LUTEAL*	POSTMENOPAUSAL
Progesterone Metabolites (Urine)					
b-Pregnanediol	Within luteal range	1095.7	ng/mg	600 - 2000	60 - 200
a-Pregnanediol	Within luteal range	314.3	ng/mg	200 - 740	15 - 50
Estrogens and Metabolites (Urine)					
Estrone (E1)	Low end of luteal range	12.60	ng/mg	12 - 26	1.0 - 7.0
Estradiol (E2)	Low end of luteal range	1.90	ng/mg	1.8 - 4.5	0.2 - 0.7
Estriol (E3)	Below luteal range	4.0	ng/mg	5 - 18	0.6 - 4.0
2-OH-E1	Within luteal range	9.19	ng/mg	5.1 - 13.1	0.3 - 2.0
4-OH-E1	Within luteal range	1.17	ng/mg	0 - 1.8	0 - 0.3
16-OH-E1	Low end of luteal range	0.70	ng/mg	0.7 - 2.6	0.2 - 0.6
2-Methoxy-E1	Low end of luteal range	2.50	ng/mg	2.5 - 6.5	0.3 - 1.4
2-OH-E2	Low end of luteal range	0.08	ng/mg	0 - 3.1	0 - 0.52
4-OH-E2	Within luteal range	0.15	ng/mg	0 - 0.52	0 - 0.12
Total Estrogen	Below range	32.3	ng/mg	35 - 70	3.5 - 15
Metabolite Ratios (Urine)					
2-OH / 16-OH-E1 Balance	Above range	13.13	ratio	2.69 - 11.83	
2-OH / 4-OH-E1 Balance	Within range	7.85	ratio	5.4 - 12.62	
2-Methoxy / 2-OH Balance	Below range	0.27	ratio	0.39 - 0.67	
Androgens and Metabolites (Urine)				**Range**	
DHEA-S	Below range	9.1	ng/mg	20 - 750	
Androsterone	Within range	247.0	ng/mg	200 - 1650	
Etiocholanolone	Below range	187.5	ng/mg	200 - 1000	
Testosterone	Within range	3.41	ng/mg	2.3 - 14	
5a-DHT	Within range	0.6	ng/mg	0 - 6.6	
5a-Androstanediol	Within range	6.8	ng/mg	6 - 30	
5b-Androstanediol	Below range	11.2	ng/mg	12 - 75	
Epi-Testosterone	Within range	3.0	ng/mg	2.3 - 14	

* The Luteal Range represents the expected premenopausal luteal range, collected menstrual cycle days 19-22 of a 28-day cycle. If your patient noted taking oral progesterone, the reference range represents the expected range on 100 - 200 mg of oral micronized progesterone (OMP). The ranges in the table below represent ranges in other times of the cycle your patient may have collected, such as follicular or ovulatory phases.

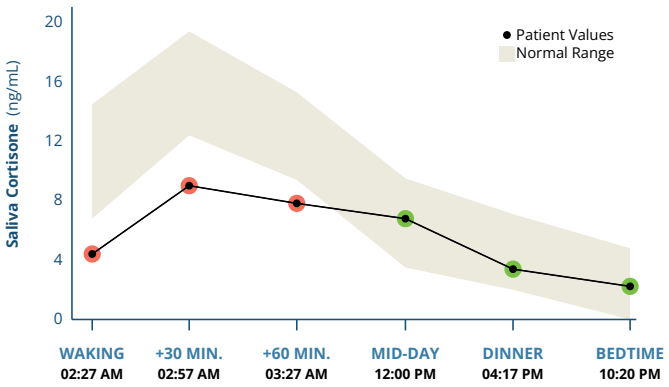
ADDITIONAL NORMAL RANGES	FOLLICULAR	OVULATORY	ON ORAL PG
b-Pregnanediol	100 - 300	100 - 300	2000 - 9000
a-Pregnanediol	25 - 100	25 - 100	580 - 3000
Estrone (E1)	4.0 - 12.0	22 - 68	N/A
Estradiol (E2)	1.0 - 2.0	4.0 - 12.0	N/A

EXPANDED CORTISOL & ADRENAL HORMONES

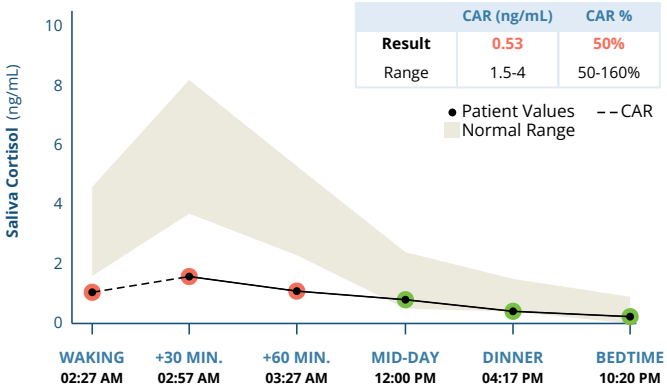
Optimal Luteal Range | Postmenopausal Range | Out of Range | Edge of Range

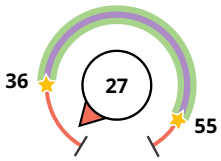


Saliva Free Cortisone Pattern



Saliva Free Cortisol Pattern





Saliva Cortisone Total

Sum of S1 - 5

Cortisol and Cortisone interconvert (11b-HSD)

Saliva Cortisol Total

Sum of S1 - 5

dutchplus®

Case # 1
Teresa, Burnout
123 A Street
Sometown , CA 90266
DOB: 1983-01-01
Age: 42
Sex: Female
Last Menstrual Period:
2004-02-01

Collection Times:
2025-10-09 02:27AM (S1)
2025-10-09 02:57AM (S2)
2025-10-09 03:27AM (S3)
2025-10-09 12:00PM (SX)
2025-10-09 04:17PM (S4)
2025-10-09 10:20PM (S5)
2025-10-09 02:29AM (U1)
2025-10-09 04:40AM (U2)
2025-10-09 04:20PM (U3)
2025-10-09 10:28PM (U4)

Ordering Provider:

Precision Analytical

Adrenal Hormones & Metabolites

TEST		RESULT	UNITS	NORMAL RANGE
Free Cortisol and Cortisone (Saliva)				
Cortisol Awakening Response (CAR)	Below range	0.53	ng/mL	1.5 - 4
Cortisol (S1) - Waking	Below range	1.05	ng/mL	1.6 - 4.6
Cortisol (S2) - +30 Min.	Below range	1.58	ng/mL	3.7 - 8.2
Cortisol (S3) - +60 Min.	Below range	1.09	ng/mL	2.3 - 5.3
Cortisol (SX) - Mid-Day	Low end of range	0.80	ng/mL	0.5 - 2.4
Cortisol (S4) - Dinner	Low end of range	0.41	ng/mL	0.4 - 1.5
Cortisol (S5) - Bedtime	Within range	0.23	ng/mL	0 - 0.9
Cortisone (S1) - Waking	Below range	4.41	ng/mL	6.8 - 14.5
Cortisone (S2) - +30 Min.	Below range	9.01	ng/mL	12.4 - 19.4
Cortisone (S3) - +60 Min.	Below range	7.82	ng/mL	9.4 - 15.3
Cortisone (SX) - Mid-Day	Within range	6.79	ng/mL	3.5 - 9.5
Cortisone (S4) - Dinner	Within range	3.39	ng/mL	2 - 7.1
Cortisone (S5) - Bedtime	Within range	2.23	ng/mL	0 - 4.8
Saliva Cortisol Total (S1 - 5)	Below range	4.37	ng/mL	9.6 - 19.3
Saliva Cortisone Total (S1 - 5)	Below range	26.86	ng/mL	36 - 55
Creatinine (Urine)				
Creatinine (U1) - Waking	Within range	1.26	mg/ml	0.2 - 2
Creatinine (U2) - +2 Hours	Within range	0.69	mg/ml	0.2 - 2
Creatinine (U3) - Dinner	Within range	0.48	mg/ml	0.2 - 2
Creatinine (U4) - Bedtime	Within range	0.71	mg/ml	0.2 - 2
Cortisol Metabolites and DHEA-S (Urine)				
a-Tetrahydrocortisol (a-THF)	Below range	34.0	ng/mg	75 - 370
b-Tetrahydrocortisol (b-THF)	Below range	543.5	ng/mg	1050 - 2500
b-Tetrahydrocortisone (b-THE)	Low end of range	1890.4	ng/mg	1550 - 3800
Metabolized Cortisol (THF + THE)	Below range	2468.0	ng/mg	2750 - 6500
DHEA-S	Below range	9.1	ng/mg	20 - 750
Cortisol Clearance Rate (CCR)	Within range	79.1		45 - 95

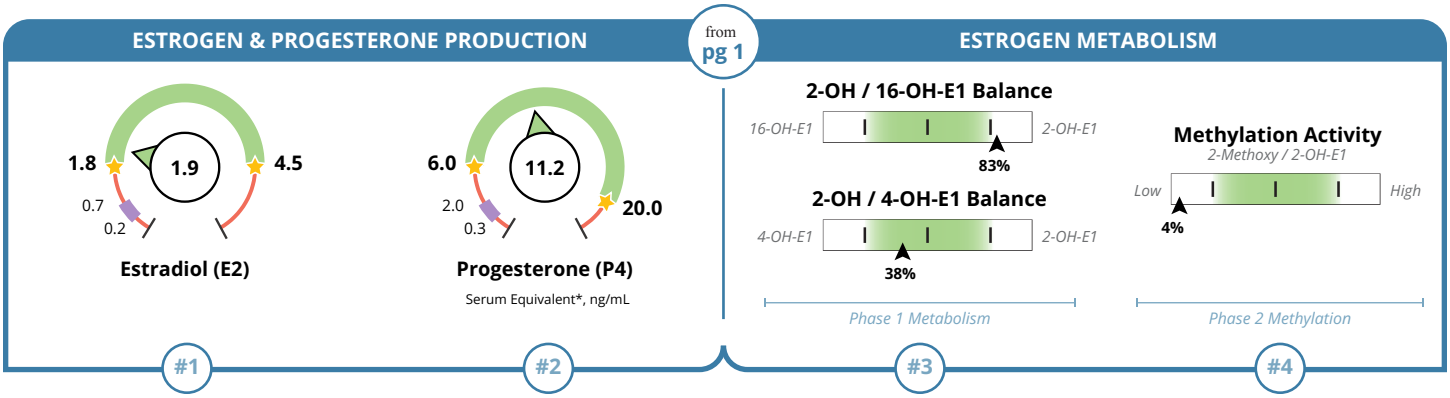
Organic Acid Tests (OATs)

TEST		RESULT	UNITS	NORMAL RANGE
Nutritional Organic Acids (Urine)				
Vitamin B12 Marker - May be deficient if high				
Methylmalonate (MMA)	Above range	2.9	ug/mg	0 - 2.5
Vitamin B6 Markers - May be deficient if high				
Xanthurenate	Above range	1.30	ug/mg	0.12 - 1.2
Kynurenate	Above range	4.7	ug/mg	0.8 - 4.5
Biotin Marker - May be deficient if high				
b-Hydroxyisovalerate	Above range	18.4	ug/mg	0 - 12.5
Glutathione Marker - May be deficient if high				
Pyroglutamate	Within range	49.3	ug/mg	28 - 58
Gut Marker - Potential gut putrefaction or dysbiosis if high				
Indican	Within range	31.6	ug/mg	0 - 100
Neuro-Related Markers (Urine)				
Dopamine Metabolite				
Homovanillate (HVA)	Below range	2.9	ug/mg	3 - 11
Norepinephrine/Epinephrine Metabolite				
Vanilmandelate (VMA)	Low end of range	2.5	ug/mg	2.2 - 5.5
Neuroinflammation Marker				
Quinolinate	Within range	5.0	ug/mg	0 - 9.6
Additional Markers (Urine)				
Melatonin - Waking				
6-OH-Melatonin-Sulfate	Below range	3.8	ng/mg	10 - 85
Oxidative Stress / DNA Damage				
8-Hydroxy-2-deoxyguanosine (8-OHdG)	Within range	1.6	ng/mg	0 - 5.2

- The MMA is above the range. This may indicate vitamin B12 or adenosylcobalamin deficiency. B12 is important for phase 2 methylation (estrogen detox), neurotransmitter synthesis, and other key processes.
- Both the xanthurenate and kynurenate are above the range. This may indicate vitamin B6 deficiency. B6 is important for phase 2 methylation (estrogen detox), neurotransmitter synthesis, and other key processes. Tryptophan taken within 72 hours before testing can also raise these markers without indicating a true B6 deficiency.
- The b-hydroxyisovalerate is above the range. This may indicate biotin (vitamin B7) deficiency.
- The HVA, a metabolite of dopamine, is below the normal range. This may be seen with low dopamine or with slow methylation. Review dopamine-related symptoms before initiating treatment.
- The waking urinary 6-OH-Melatonin-Sulfate is low. This reflects low overnight production of melatonin. This may be implicated in poor sleep and insomnia.

About Your Results | Estrogen & Progesterone

The following *About Your Results* sections include key DUTCH report elements from page 1 to aid your interpretation.



Estrogen-related Patient or Sample Comments:

#1. Assess estrogen levels given the patient's reproductive status. More information is available here.

- Estradiol (the most potent estrogen is **1.90 ng/mg**, which is within the optimal luteal range, but toward the lower end. If paired with other low estrogen markers, this may contribute to estrogen deficiency symptoms.

#2. Assess progesterone levels given the patient's reproductive status. More information is available here.

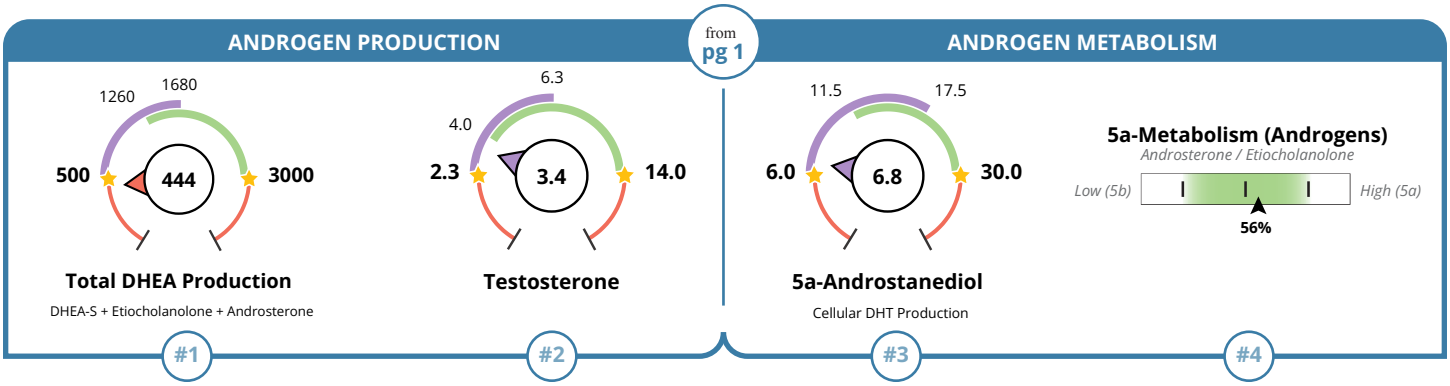
- The progesterone serum equivalent is **11.2 ng/mL**, which is within the optimal luteal range. This indicates that the patient ovulated.

#3. Assess 2-OH preference in phase 1 estrogen metabolism. More information is available here.

- The 2-OH/16-OH-E1 is higher than **83.0%** of the population, which is above the optimal range. This indicates a preference for the beneficial 2-OH-E1 metabolite compared to the estrogenic 16-OH-E1 metabolite.
- The 2-OH/4-OH-E1 is higher than **38.0%** of the population, which is within the optimal range. This indicates a balance between the beneficial 2-OH-E1 metabolite and the potentially genotoxic (DNA damaging) 4-OH-E1 metabolite.

#4. Assess methylation of 2-OH catechol estrogens. More information is available here.

- The methylation activity is higher than only **4.00%** of the population, which is below the optimal range. This indicates slow estrogen methylation, which inhibits estrogen detoxification.



Androgen-related Patient or Sample Comments:

- Women aged 41-55 may fall within or below the optimal premenopausal androgen range. Symptoms and other androgen levels should be considered when assessing whether these levels are appropriate for the patient. This age range includes the typical transition through perimenopause and menopause, which can vary significantly between individuals. Therefore, androgen results in this group should be interpreted with both premenopausal and postmenopausal reference ranges in mind.
- The patient reports significant symptoms of androgen deficiency.

#1. Assess adrenal androgen levels (Total DHEA). More information is available here.

- The total DHEA production is **444 ng/mg**, which is below the overall range, meaning it is low for women of any age. These three DHEA metabolites represent about 75% of adrenal androgens, which are typically the source of more than half a woman's circulating testosterone and a significant portion of circulating estrogens.

#2. Assess testosterone levels. More information is available here.

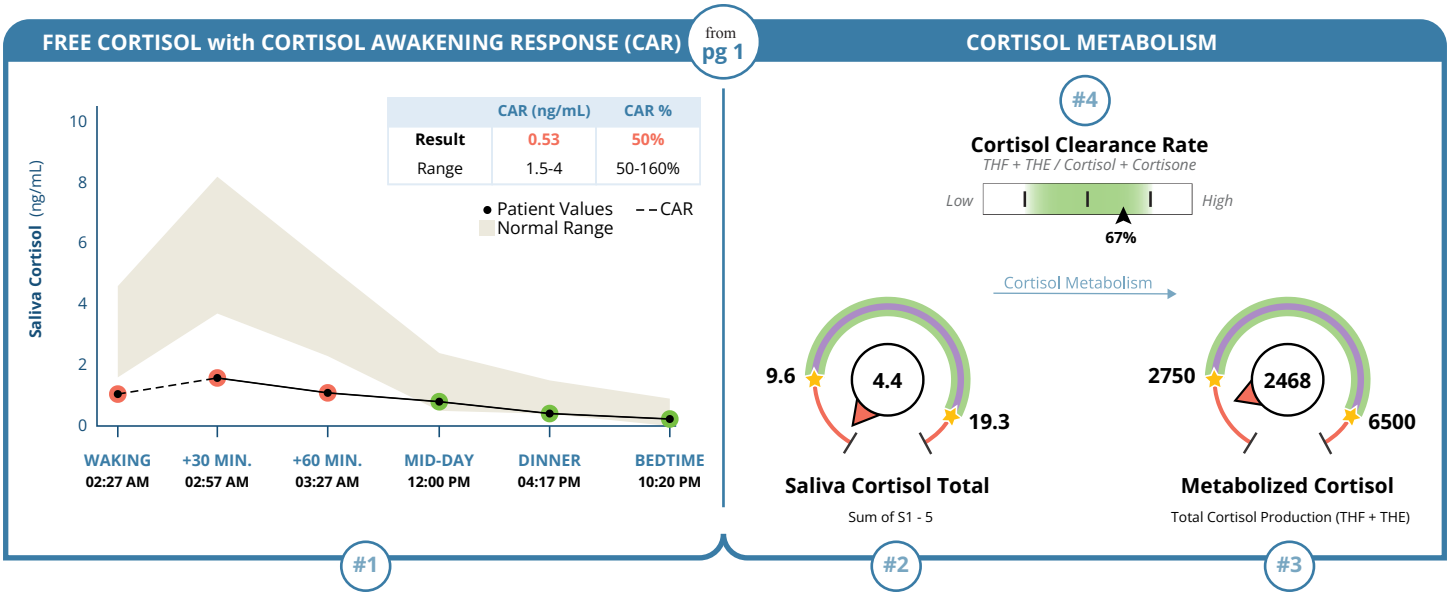
- Testosterone is **3.41 ng/mg**, which is below the optimal premenopausal range, but within the postmenopausal range. If paired with low 5a-androstanediol, this may contribute to low androgen symptoms. In most cases, 25-50% of testosterone comes from the ovaries and the rest from adrenal androgen production (see above). Testosterone is a strong androgen and can become 3x more potent if metabolized to 5a-DHT (see below) within target tissue.

#3. Assess cellular production of 5a-DHT via 5a-androstanediol. More information is available here.

- 5a-Androstanediol is **6.8 ng/mg**, which is below the optimal premenopausal range, but within the postmenopausal range range. 5a-Androstanediol reflects the tissue activity of 5a-DHT (the most potent androgen). If paired with low testosterone, this may contribute to low androgen symptoms.

#4. Assess if there is a preference for the more potent alpha metabolism of the androgens. More information is available here.

- 5a-Metabolism of androgens is higher than **56.0%** of the population, which is within the range. This indicates balanced metabolism of androgens.



Cortisol-related Patient or Sample Comments:

- The patient reported significant fatigue in both the AM and PM.

#1. Assess the daily free cortisol pattern including the CAR. More information is available here and here.

- One or more points on the Saliva Free Cortisol Pattern are out of the optimal range. Note the time of day and whether out-of-range results are low or high at each point.
- The CAR is **50.0%**, which is within the optimal range. This indicates a normal stress response upon waking.

#2. Assess the daily total (sum of S1-S5) of free cortisol in circulation. More information is available here.

- The Saliva Cortisol Total is **4.37 ng/mL**, which is below the optimal range. This indicates low overall cortisol levels. Review the Saliva Free Cortisol Pattern and CAR results carefully. The 30-minute point is usually the highest cortisol point of the day. If the CAR and the 30 minute point are low, this may lower the Saliva Cortisol Total.

#3. Assess the total cortisol produced by the adrenal glands (Metabolized Cortisol). More information is available here.

- The Metabolized Cortisol, which reflects the total cortisol output for the day, is **2,468 ng/mg**, which is below the optimal range.

#4. Assess the rate of cortisol clearance from the body. More information is available here.

- The Cortisol Clearance Rate is higher than **67.0%** of the population, which is within the optimal range. This indicates that cortisol and cortisone are being metabolized at a normal rate.

The previous "About Your Results" pages look at core insights for the DUTCH report shown on the Hormone Testing Summary page, all of which are worth considering for most patients. Next, "Advanced Insights" cover additional features within the DUTCH test that require reviewing the pages after the summary page. These concepts are more complex but can be highly relevant for some patients. Review the concepts and look for patient-specific comments, when notable, in bullets.

ESTROGEN & PROGESTERONE

#1. Assess whether E1, E3, or Total Estrogen levels add more insight into overall estrogenic activity.

While E2 is the most potent estrogen, other estrogens such as estrone (E1), and sometimes estriol (E3), also contribute to overall estrogenic activity. Additionally, examining Total Estrogens (listed on the Sex Hormones & Metabolites page) can provide insight into overall estrogen production, which may not be fully reflected in the E2 result alone.

E1 is 10% as potent as E2 but is typically more abundant, about 5x higher in premenopausal women and 10x higher in postmenopausal women. This makes it a significant contributor to estrogenic symptoms (high or low), especially in menopause. While all estrogens are potent immune stimulators, E1 may promote more inflammatory cytokine production than other estrogens. Reviewing the relative level of E1 to E2 may give further insight into estrogenic symptoms (high or low) and long-term outcomes, especially in menopause. In cases where E1 is significantly different from E2, a note will be here describing the potential impact.

E3 is a weak estrogen that may have anti-inflammatory properties. In most conditions, E3 is not a significant contributor to estrogenic symptoms. However, when supplemented, checking levels may be helpful. Since the route of administration can influence how the test result is interpreted, notes on E3 supplements (such as creams or pills) will be shown here, if applicable.

The Total Estrogen level should be viewed secondarily to the most potent estrogen levels like E1 and E2, which typically match the patient presentation best. For example, Total Estrogen can be high with robust, healthy estrogen metabolism. Therefore, its levels do not always indicate a cause for high or low estrogen-related symptoms. If out of range, the Total Estrogen level will be noted here.

- The Total Estrogen result is 32.3 ng/mg, which is below the optimal range. Review carefully for the timing of the test within the cycle, as this range is set for the luteal phase. Also review for estrogen metabolism and reported low estrogen symptoms. Some estrogens included in this result are more potent and some are weak.

#2. Assess if there is a preference for alpha metabolism of progesterone. More information is available here.

The slider bar for 5a-metabolism of progesterone metabolites reflects the balance between a-pregnanediol and b-pregnanediol. Most progesterone is typically metabolized to b-pregnanediol, but a-pregnanediol is an active metabolite that can bind to GABA receptors in the central nervous system. A higher result on the 5a-metabolism (P4) slider indicates that available progesterone has a greater potential for impact on GABA receptors.

- 5a-metabolism of progesterone is higher than **28.0%** of the population, which is in the normal range. This indicates that the patient does not have an extreme metabolic preference for either pathway. 5a progesterone metabolites are active on GABA receptors and may impact mood and sleep. This is most relevant when patients have luteal levels of progesterone or higher, and especially relevant for those on oral/sublingual progesterone.

#3. Assess estrogen clearance through phase 1 and 2. More information is available here.

By looking at the parent estrogens (E1, E2) and their breakdown products (2OH, 4OH, 16OH, and 2MeOHE1), we can see how quickly estrogen is being metabolized. If the parent estrogens are higher than the breakdown products, it means estrogen is clearing more slowly, which increases risk of estrogen excess symptoms. Balanced levels show normal clearance, while lower parent estrogens compared to breakdown products suggest faster clearance, decreasing the risk of estrogen excess symptoms.

- The phase 1 estrogen metabolites levels are balanced with the primary estrogens (E1, E2). This indicates normal phase 1 estrogen clearance.

#4. Assess whether any of the estrogen-related organic acids are out of range. More information is available here.

Estrogen levels, metabolites, and metabolism patterns can be influenced by nutrient status, oxidative stress, and gut health. Imbalances in glutathione, B12, B6, gut dybiosis, and oxidative stress markers will be commented on here, if relevant for the patient. This may help identify contributing factors affecting estrogens.

- The Methylmalonate (MMA) is **2.90 ug/mg**, which is above the optimal range. This may indicate B12 deficiency. B12 supports optimal methylation and may be useful in this case.
- Either Xanthurenate, Kynurenate, or both are above range. This may indicate B6 deficiency. B6 supports optimal methylation, which may be useful in this case.

ANDROGENS

#1. Assess if the DHEA-S is relatively lower than the Total DHEA. More information is available here.

DHEA-S is primarily produced in the adrenals through sulfation. Inflammation can inhibit sulfation, lowering DHEA-S levels and diverting DHEA metabolism toward 5a- and 5b-reductase pathways, resulting in higher etiocholanolone (5b-metabolite) and androsterone (5a-metabolite) levels relative to DHEA-S. Review the patient's results to assess if this pattern is present.

#2. Assess the androgen pattern to determine if urine testosterone may not accurately reflect systemic levels (UGT2B17 deletion). More information is available here.

- This advanced topic is only relevant if the patient has low testosterone (T) with other specific patterns of androgen metabolites, especially when levels of Epi-T (see page 3) are much higher than T on the DUTCH Test. In patients that do have a suspicious pattern, urine testosterone may underestimate true testosterone levels. This patient's results do NOT indicate a reason to be suspicious of the urine testosterone levels. For information on this topic, see this video.

#3. While 5a-androstanediol best represents cellular 5a-DHT production, assess if 5a-DHT offers additional insight into androgenic activity. More information is available here.

5a-DHT is testosterone's active metabolite and is three times more potent than testosterone. If elevated it may contribute to androgen excess symptoms. Research shows 5a-androstanediol may be a better marker of 5a-DHT tissue activity, but the 5a-DHT result may provide additional insight. Review the 5a-DHT result in context of other androgens and androgenic symptoms for a deeper understanding of the androgen results.

#4. Assess whether any of the androgen-related organic acids are out of range. More information is available here.

Androgen levels can be influenced by inflammation and nutrient status. Imbalances in B6 and neuroinflammation markers will be commented on here, if relevant for this patient's androgens. This may help identify factors contributing to androgen imbalances, if present.

ADRENAL

#1. Assess if cortisone (inactive) adds more insight to the free cortisol assessment. More information is available here.

If the cortisone is significantly different from cortisol, there will be a bulleted comment below.

Cortisol is an active adrenal glucocorticoid, while cortisone is an inactive "storage" form. In the saliva gland, a significant amount of cortisol is converted to cortisone before excretion into the saliva. Therefore, salivary cortisone should be considered a reflection or "shadow" of systemic cortisol. The degree to which this happens in an individual may vary. If free cortisone is significantly higher than free cortisol, it may indicate free cortisol levels were higher in circulation (serum) than the salivary free cortisol implies. If free cortisone is lower than free cortisol, this may indicate free cortisol levels were not as high in circulation (serum) as salivary free cortisol implies.

#2. Assess if there is a whole-body preference for (inactive) cortisone or (active) cortisol. More information is available here.

The Systemic Preference slider reflects the balance between cortisol (THF) and cortisone (THE) metabolites and is influenced by systemic cortisol needs. The balance between THF and THE is the best estimation of the systemic balance of cortisol to cortisone. As these metabolites are processed through the liver, the body may shift to cortisol (THF) in response to acute stressors (e.g., immune activation or infection), or toward cortisone (THE) with chronic stress (e.g., long-term inflammation or illness). Review the patient's result to determine if they are out of range.

- The Systemic Preference slider is higher than only **4.00%** of the population, which is below the optimal range. This indicates significantly higher levels of cortisone metabolites compared to cortisol metabolites. If free cortisol levels are robust, this may be protective by turning off excess cortisol to balance tissue levels. If cortisol levels are low, this may contribute to low cortisol symptoms.

#3. Assess for anabolic-catabolic balance

- The Total DHEA Production is low compared to the Total Cortisol Production. Androgens promote tissue growth and repair, while cortisol promotes tissue breakdown. When androgens are significantly lower than cortisol, as in this case, it may suggest a catabolic (breakdown) state.

#4. Assess whether any of the cortisol-related organic acids are out of range. More information is available here.

Cortisol can be impacted by inflammation, nutrient status, and sleep. Imbalances in B12, B6, melatonin, and neuroinflammation markers will be commented on here if relevant for the patient. This may help identify contributing factors affecting cortisol results.

Thank you for choosing DUTCH for your functional endocrinology testing needs!

Please review our DUTCH resources for information on reading the DUTCH test:
For DUTCH Overviews and Tutorials, click here: https://dutchtest.com/tutorials
To view the steroid pathway chart, click here: https://dutchtest.com/steroid-pathway

Finally, please review the patient's results along with their requisition form. It is designed to capture relevant medications, symptoms, diagnoses, sample collection, and notes that may be helpful in interpreting the results.

Additional Comments

Reference Range Percentiles

Reference ranges are developed by testing thousands of healthy individuals, while excluding results from outliers or those on impactful medications. A percentile approach is applied, as is done with most labs. Classic reference ranges use the 95th percentile as the upper end of range and the 5th percentile as the lower end of range. Our DUTCH ranges uses the percentiles found in the table below. We feel these ranges reflect the more optimal range sought in functional medicine practices. The table below shows the percentiles used for the reference range of each analyte on the DUTCH report:

Female Reference Ranges (Updated 10.15.2025)									
	Low%	High%	Low	High		Low%	High%	Low	High
b-Pregnanediol	20%	90%	600	2000	Cortisol Awakening Response (CAR)	20%	90%	1.5	4
a-Pregnanediol	20%	90%	200	740	Cortisol (S0) - Mid-Sleep	0	90%	0	0.9
Estrone (E1)	20%	80%	12	26	Cortisol (S1) - Waking	20%	90%	1.6	4.6
Estradiol (E2)	20%	80%	1.8	4.5	Cortisol (S2) - +30 Min.	20%	90%	3.7	8.2
Estriol (E3)	20%	80%	5	18	Cortisol (S3) - +60 Min.	20%	90%	2.3	5.3
2-OH-E1	20%	80%	5.1	13.1	Cortisol (SX) - Mid-Day	20%	90%	0.5	2.4
4-OH-E1	0	80%	0	1.8	Cortisol (S4) - Dinner	20%	90%	0.4	1.5
16-OH-E1	20%	80%	0.7	2.6	Cortisol (S5) - Bedtime	0	95%	0	0.9
2-Methoxy-E1	20%	80%	2.5	6.5	Cortisone (S0) - Mid-Sleep	0	90%	0	4.8
2-OH-E2	0	80%	0	3.1	Cortisone (S1) - Waking	20%	90%	6.8	14.5
4-OH-E2	0	80%	0	0.52	Cortisone (S2) - +30 Min.	20%	90%	12.4	19.4
2-16-ratio	20%	80%	2.69	11.83	Cortisone (S3) - +60 Min.	20%	90%	9.4	15.3
2-4-ratio	20%	80%	5.4	12.62	Cortisone (SX) - Mid-Day	20%	90%	3.5	9.5
2Me-2OH-ratio	20%	80%	0.39	0.67	Cortisone (S4) - Dinner	20%	90%	2	7.1
DHEA-S	20%	90%	20	750	Cortisone (S5) - Bedtime	0	95%	0	4.8
Androsterone	20%	80%	200	1650	Cortisol Clearance Rate (CCR)	20%	80%	45	95
Etiocholanolone	20%	80%	200	1000	Melatonin (6-OHMS)	20%	90%	10	85
Testosterone	20%	80%	2.3	14	8-OHdG	0	90%	0	5.2
5a-DHT	0	80%	0	6.6	Methylmalonate	0	90%	0	2.5
5a-Androstanediol	20%	80%	6	30	Xanthurenate	0	90%	0.12	1.2
5b-Androstanediol	20%	80%	12	75	Kynurenate	0	90%	0.8	4.5
Epi-Testosterone	20%	80%	2.3	14	b-Hydroxyisovalerate	0	90%	0	12.5
a-THF	20%	90%	75	370	Pyroglutamate	10%	90%	28	58
b-THF	20%	90%	1050	2500	Indican	0	90%	0	100
b-THE	20%	90%	1550	3800	Homovanillate	10%	95%	3	11
					Vanilmandelate	10%	95%	2.2	5.5
					Quinolinate	0	90%	0	9.6
					Calculated Values				
					Total DHEA Production	20%	80%	500	3000
% = population percentile: Example - a high limit of 90% means results higher than 90% of the women tested for the reference range will be designated as "high."					Total Estrogens	20%	80%	35	70
					Metabolized Cortisol	20%	90%	2750	6500
					Saliva Cortisol Total	20%	90%	9.6	19.3
					Saliva Cortisone Total	20%	90%	36	55