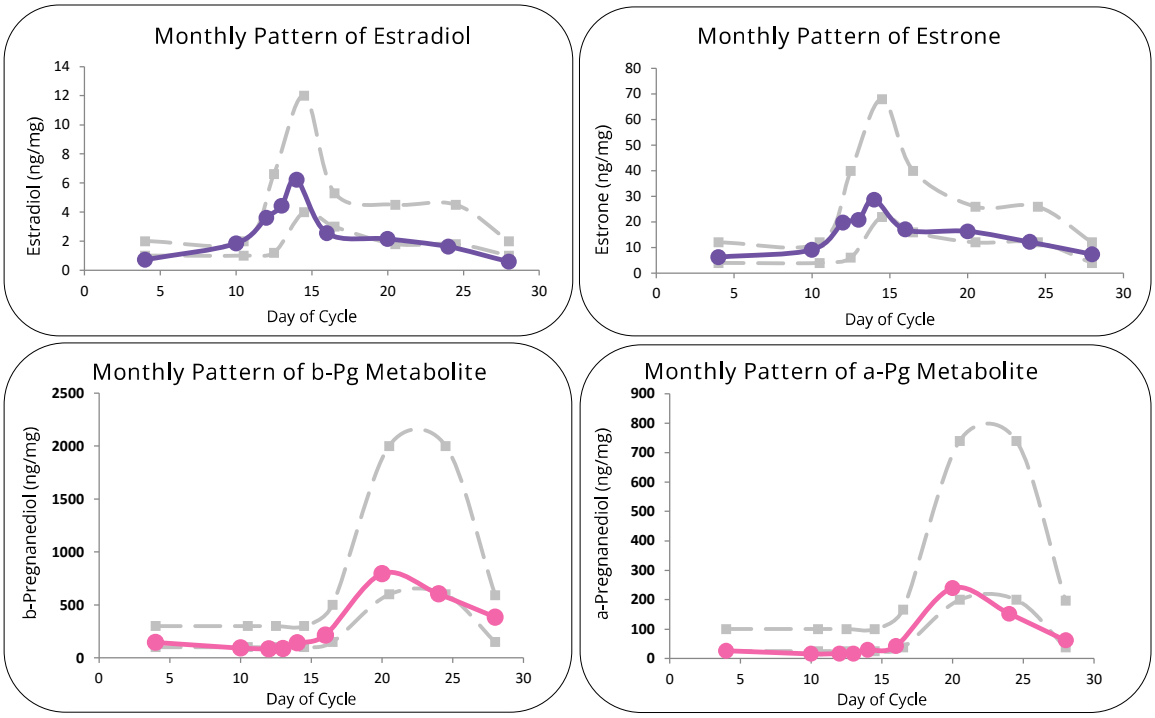
dutchtest® CYCLE MAPPING

Name: Female Sample Report
D.O.B. 04/09/93
Collection Dates:
9/9-10/1/2025
Provider: Precision Analytical
Accession # 1094122

Estrogen (E) patterns can be seen below in purple. Progesterone (Pg) patterns can be seen below in pink. Normal ranges are within the gray dashed lines. See page 2 for more information.



All values given in ng/mg creatinine

Measurement	1	2	3	4	5	6	7	8	9
Day(s) of Cycle	4	10	12	13	14	16	20	24	28

The days listed above were used for measurements. Two samples are used and listed for long cycles or patients without a normal cycle.

Estradiol (E2)	0.72	1.84	3.61	4.43	6.22	2.55	2.15	1.62	0.59
Estrone (E1)	6.3	9.1	19.7	20.8	28.7	17.0	16.3	12.1	7.3
a-Pregnanediol	26	16	17	17	30	42	239	152	62
b-Pregnanediol	146	93	85	88	140	214	794	603	383
b-Pregnanediol/E2 Ratio	201	50	23	20	23	84	369	373	653
Creatinine		1.07	0.78	1.28	0.59	0.63	1.80	0.76	1.13

Sample (#7) with the highest b-Pg value (794) is used for E and Pg metabolites for DUTCH Complete or Plus if ordered.

Normal Ranges	Follicular	Ovulatory	Luteal	Postmenopausal
Estradiol	1-2ng/mg	4-12ng/mg	1.8-4.5ng/mg	0.2-0.7ng/mg
Estrone	4-12ng/mg	22-68ng/mg	12-26ng/mg	1.0-7.0ng/mg
a-Pregnanediol	25-100ng/mg	25-100ng/mg	200-740ng/mg	15-50ng/mg
b-Pregnanediol	100-300ng/mg	100-300ng/mg	600-2000ng/mg	60-200ng/mg

b-Pregnanediol/E2 ratio is typically 50-300 in the follicular phase, <100 during ovulation, and 100-500 in the luteal phase. Creatinine normal range, 0.2-2.0 mg/mL. Values outside this range may be less certain due to under or overhydration.

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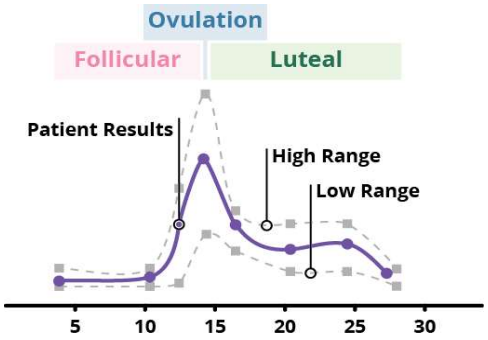
D.O.B. 04/09/93
Collection Dates:
9/9-10/1/2025
Provider: Precision Analytical
Accession # 1094122

Thank you for testing with us! If this is your first report, you are encouraged to watch our educational videos on how to read the report at www.dutchtest.com in the video library. The comments below include general information that we hope you will find useful in your understanding of the patient's results. These results and comments are not intended to diagnose any specific conditions.

You'll find four stacked graphs with the reference ranges and the patient's results mapped out. The top graphs represent estrogen (E) production, and the bottom graphs represents progesterone (Pg) production. The horizontal axis shows the cycle days (0-30+) and the vertical axis shows hormone concentration or hormone metabolites being measured. Healthy cycles typically range from 21-35 days. The patient likely submitted many samples over one cycle, and we have selected the 9 most relevant measurements. Some measurements from longer cycles are from two-day averages to ensure transitory E and Pg peaks are not missed.

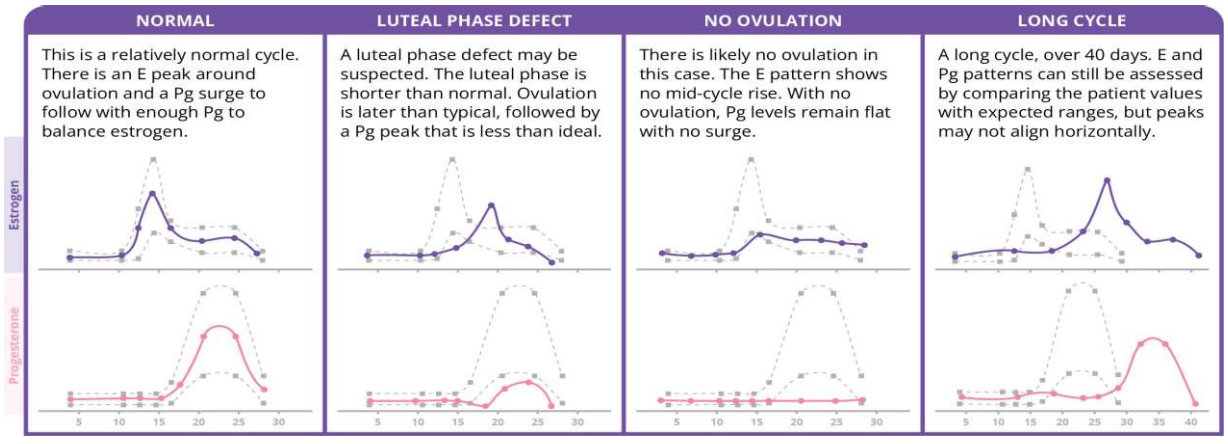


For most cycles <34 days, measurements are made from single days, selected to best represent overall patterns of ovulatory & luteal peaks. The day 4 sample set is usually collected at the end of the cycle, four days after menses (used for DUTCH Complete/Plus), but is plotted at the beginning of the cycle as above. If a DUTCH Complete or Plus was ordered, data for the E and Pg metabolite values are taken from the day on the Cycle Mapping associated with the progesterone (b-pregnanediol) peak in the luteal phase.

The first part of the cycle (days 1-14) is the "follicular phase," ovulation typically occurs mid-cycle, and the "luteal phase" refers to the 2nd half of the cycle (days 14 until menses). These phases may shift in patients with atypical cycle lengths. Levels may still be considered normal in short or long cycles even if the timing of the E or Pg peaks are at different times.

In the top graphs, we follow both primary estrogens, estrone (E1) and estradiol (E2). In a typical cycle, estrogen rises in the follicular phase, which stimulates the luteinizing hormone (LH) surge from the brain about 24-36 hours before ovulation, which leads to the production of Pg the second half of the cycle (measured by its primary pregnanediol metabolites). Pg rises only after ovulation has occurred, reaching its peak 5-7 days later, then begins to decrease before the onset of menses. When Pg does not rise it indicates that the patient is likely not ovulating. A weak rise in Pg can also indicate either no ovulation or a weak corpus luteum (luteal phase defect), which is associated with poor egg maturation, difficulty maintaining a secretory endometrium and infertility. Ranges for Pg are similar for a postmenopausal woman or a cycling woman who is in the follicular phase. In the table near the bottom of page 1 below the graphs, the patient's results are displayed in a table. This includes creatinine, which is used to correct for hydration. If creatinine is very low or very high, hormone measurements from that day may be less reliable.

Below are four different cycle patterns that may help with interpretation (video tutorial here)



dutchtest® COMPLETE

Ordering Provider:
Precision Analytical

PATIENT INFORMATION

Female Sample Report
123 A Street
Sometown , CA 90266

DOB: 1992-01-04
Age: 33
Sex: Female
Last Menstrual Period:

Accession # 01094121

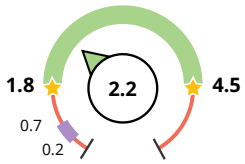
Collection Dates:
2025-10-01 (U1 U2 U3 U4)

Hormone Testing Summary

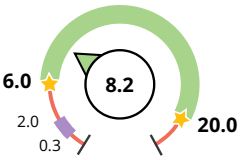
Optimal Luteal Range | Postmenopausal Range | Out of Range | Edge of Range

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

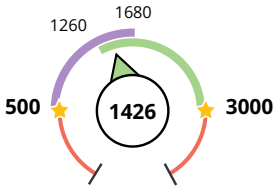
2-OH / 4-OH-E1 Balance

Phase 1 Metabolism

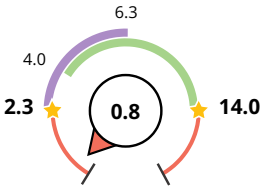
Methylation Activity
2-Methoxy / 2-OH-E1

Phase 2 Methylation

ANDROGEN PRODUCTION

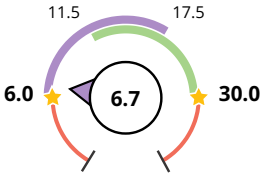


Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone



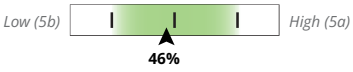
Testosterone

ANDROGEN METABOLISM

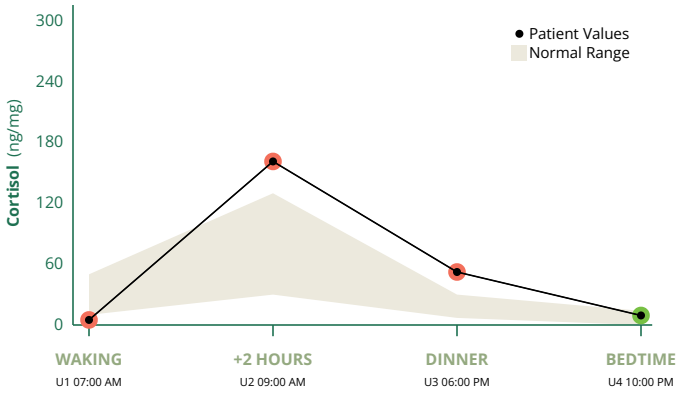


5a-Androstanediol
Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone



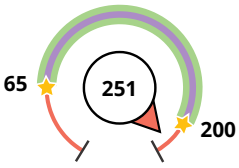
DAILY FREE CORTISOL PATTERN



CORTISOL METABOLISM

Cortisol Clearance Rate
THF + THE / Cortisol + Cortisone

Cortisol Metabolism

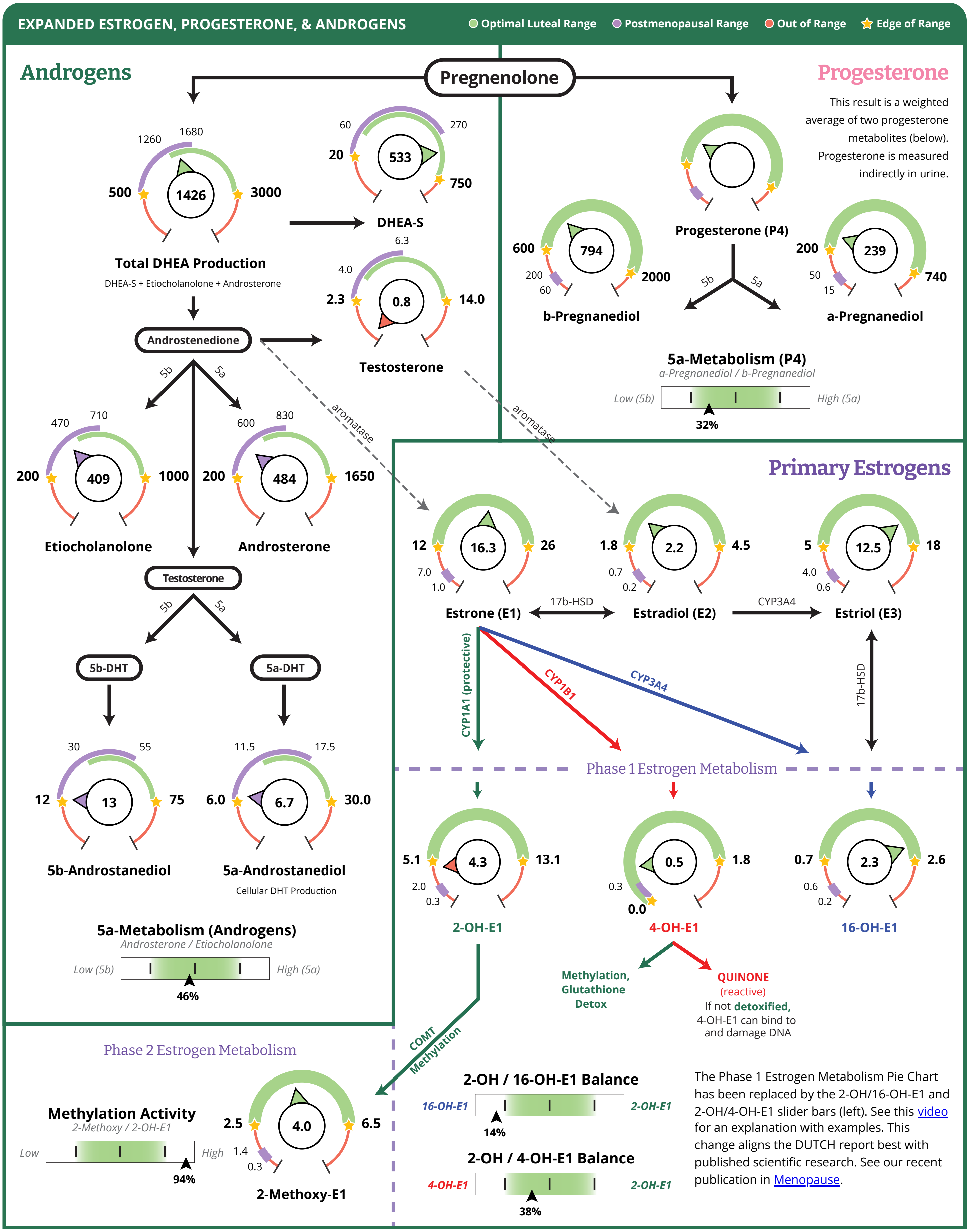


24 Hour Free Cortisol
Sum of all Values

Metabolized Cortisol
Total Cortisol Production (THF + THE)

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

Watch | Needs Attention


EXPANDED ESTROGEN, PROGESTERONE, & ANDROGENS
Optimal Luteal Range
Postmenopausal Range
Out of Range
Edge of Range
Androgens
Pregnenolone
Progesterone
This result is a weighted average of two progesterone metabolites (below). Progesterone is measured indirectly in urine.
1260
1680
500
1426
3000
Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone
60
270
20
533
750
DHEA-S
6.3
4.0
2.3
0.8
14.0
Testosterone
Progesterone (P4)
600
794
2000
200
60
b-Pregnanediol
200
239
740
50
15
a-Pregnanediol
5b
5a
5a-Metabolism (P4)
a-Pregnanediol / b-Pregnanediol
Low (5b)
High (5a)
32%
Androstenedione
aromatase
aromatase
470
710
200
409
1000
Etiocholanolone
600
830
200
484
1650
Androsterone
Primary Estrogens
12
16.3
26
7.0
1.0
Estrone (E1)
1.8
2.2
4.5
0.7
0.2
Estradiol (E2)
5
12.5
18
4.0
0.6
Estriol (E3)
17b-HSD
CYP3A4
Testosterone
5b-DHT
5a-DHT
CYP1A1 (protective)
CYP1B1
CYP3A4
17b-HSD
30
55
12
13
75
5b-Androstanediol
11.5
17.5
6.0
6.7
30.0
5a-Androstanediol
Cellular DHT Production
Phase 1 Estrogen Metabolism
5.1
4.3
13.1
2.0
0.3
2-OH-E1
0.5
1.8
0.3
0.0
4-OH-E1
0.7
2.3
2.6
0.6
0.2
16-OH-E1
5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b)
High (5a)
46%
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
94%
2.5
4.0
6.5
1.4
0.3
2-Methoxy-E1
2-OH / 16-OH-E1 Balance
16-OH-E1
2-OH-E1
14%
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.

dutchtest® COMPLETE

Accession # 01094121

Female Sample Report
123 A Street
Sometown , CA 90266

DOB: 1992-01-04
Age: 33
Sex: Female
Last Menstrual Period:

Collection Times:

2025-10-01 07:00AM (U1)
2025-10-01 09:00AM (U2)
2025-10-01 06:00PM (U3)
2025-10-01 10:00PM (U4)

Ordering Provider:

Precision Analytical

Sex Hormones & Metabolites

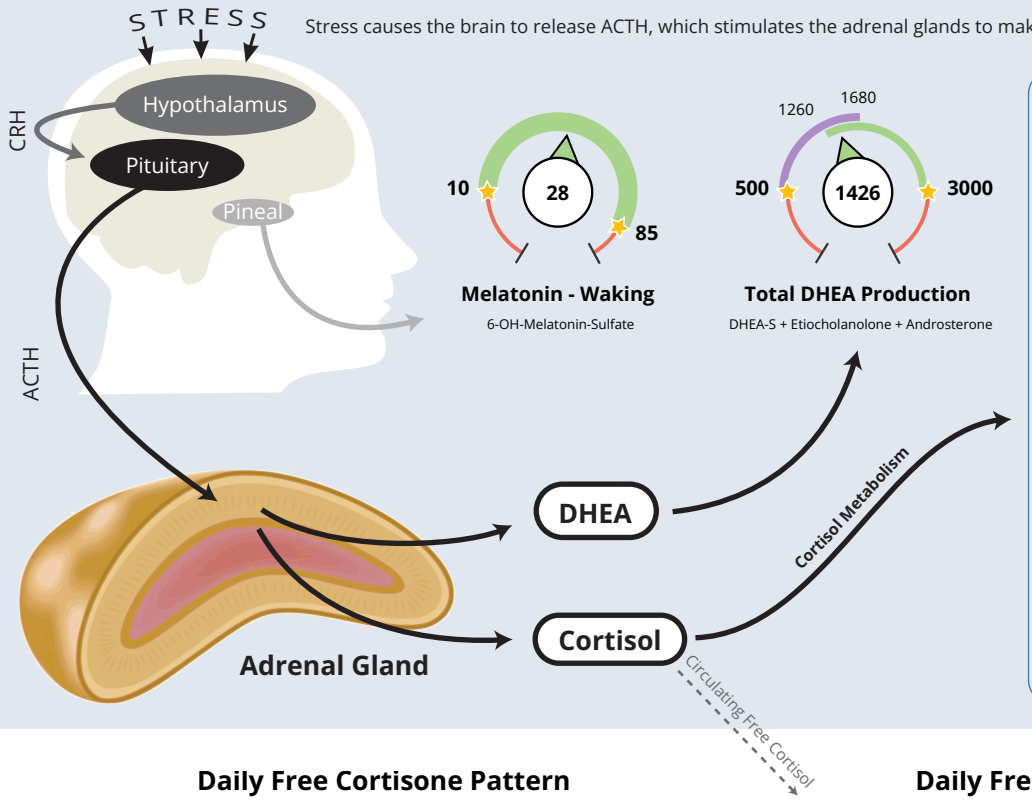
TEST		RESULT	UNITS	LUTEAL*	POSTMENOPAUSAL
Progesterone Metabolites (Urine)					
b-Pregnanediol	Low end of luteal range	794.0	ng/mg	600 - 2000	60 - 200
a-Pregnanediol	Low end of luteal range	239.2	ng/mg	200 - 740	15 - 50
Estrogens and Metabolites (Urine)					
Estrone (E1)	Within luteal range	16.33	ng/mg	12 - 26	1.0 - 7.0
Estradiol (E2)	Low end of luteal range	2.15	ng/mg	1.8 - 4.5	0.2 - 0.7
Estriol (E3)	Within luteal range	12.5	ng/mg	5 - 18	0.6 - 4.0
2-OH-E1	Below luteal range	4.25	ng/mg	5.1 - 13.1	0.3 - 2.0
4-OH-E1	Within luteal range	0.54	ng/mg	0 - 1.8	0 - 0.3
16-OH-E1	High end of luteal range	2.31	ng/mg	0.7 - 2.6	0.2 - 0.6
2-Methoxy-E1	Within luteal range	3.97	ng/mg	2.5 - 6.5	0.3 - 1.4
2-OH-E2	Within luteal range	0.67	ng/mg	0 - 3.1	0 - 0.52
4-OH-E2	Within luteal range	0.12	ng/mg	0 - 0.52	0 - 0.12
Total Estrogen	Within range	42.8	ng/mg	35 - 70	3.5 - 15
Metabolite Ratios (Urine)					
2-OH / 16-OH-E1 Balance	Below range	1.84	ratio	2.69 - 11.83	
2-OH / 4-OH-E1 Balance	Within range	7.87	ratio	5.4 - 12.62	
2-Methoxy / 2-OH Balance	Above range	0.93	ratio	0.39 - 0.67	
Androgens and Metabolites (Urine)				**Range**	
DHEA-S	Within range	532.5	ng/mg	20 - 750	
Androsterone	Within range	484.2	ng/mg	200 - 1650	
Etiocholanolone	Within range	408.9	ng/mg	200 - 1000	
Testosterone	Below range	0.81	ng/mg	2.3 - 14	
5a-DHT	Within range	0.4	ng/mg	0 - 6.6	
5a-Androstanediol	Within range	6.7	ng/mg	6 - 30	
5b-Androstanediol	Within range	13.0	ng/mg	12 - 75	
Epi-Testosterone	Within range	3.4	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.

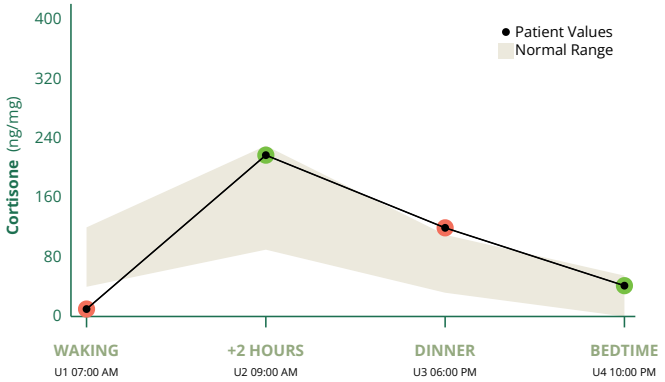
ADDITIONAL NORMAL RANGES	FOLLICULAR	OVULATORY	ON ORAL PG
b-Pregnanediol	100 - 300	100 - 300	2000 - 9000
a-Pregnanediol	25 - 100	25 - 100	580 - 3000
Estrone (E1)	4.0 - 12.0	22 - 68	N/A
Estradiol (E2)	1.0 - 2.0	4.0 - 12.0	N/A

EXPANDED CORTISOL & ADRENAL HORMONES

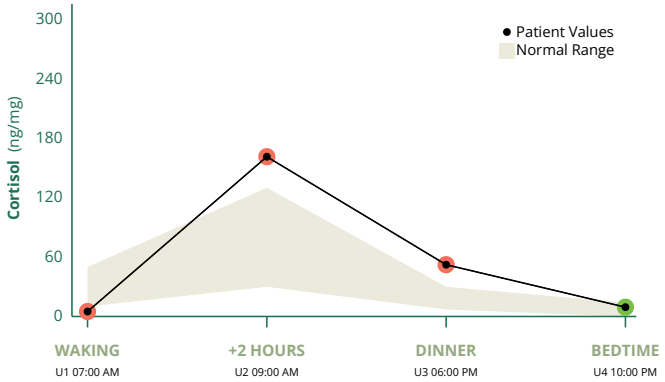
Optimal Luteal Range | Postmenopausal Range | Out of Range | Edge of Range

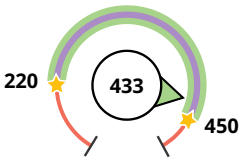


Daily Free Cortisone Pattern



Daily Free Cortisol Pattern





24 Hour Free Cortisone

Sum of all Values

Cortisol and Cortisone interconvert (11b-HSD)

24 Hour Free Cortisol

Sum of all Values

dutchtest® COMPLETE

Accession # 01094121

Female Sample Report
123 A Street
Sometown , CA 90266
DOB: 1992-01-04
Age: 33
Sex: Female
Last Menstrual Period:

Collection Times:

2025-10-01 07:00AM (U1)
2025-10-01 09:00AM (U2)
2025-10-01 06:00PM (U3)
2025-10-01 10:00PM (U4)

Ordering Provider:

Precision Analytical

Adrenal Hormones & Metabolites

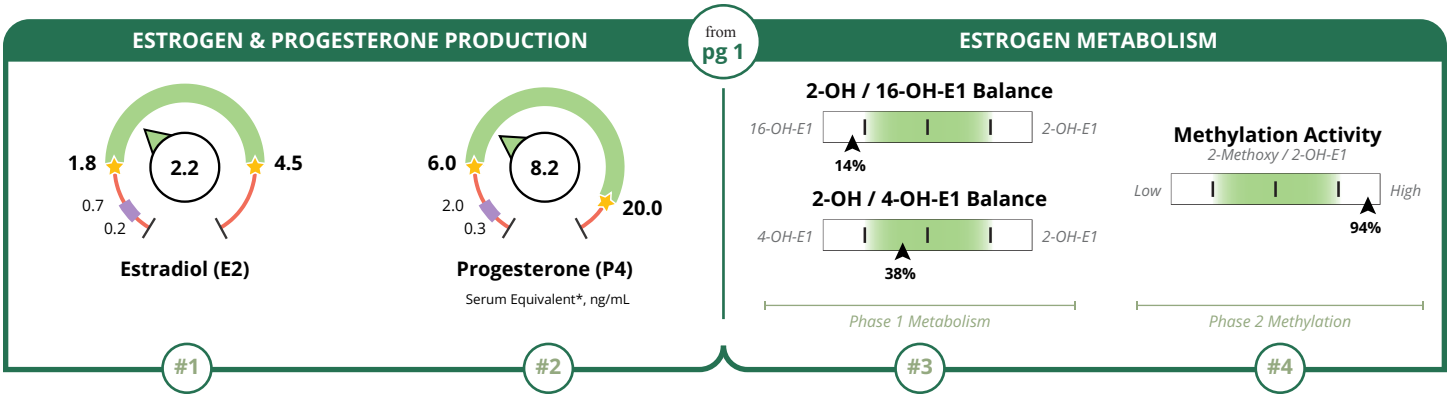
TEST		RESULT	UNITS	NORMAL RANGE
Daily Free Cortisol and Cortisone (Urine)				
Cortisol (U1) - Waking	Below range	5.0	ng/mg	10 - 50
Cortisol (U2) - +2 Hours	Above range	161.4	ng/mg	30 - 130
Cortisol (U3) - Dinner	Above range	52.3	ng/mg	7 - 30
Cortisol (U4) - Bedtime	Within range	9.4	ng/mg	0 - 14
Cortisone (U1) - Waking	Below range	10.0	ng/mg	40 - 120
Cortisone (U2) - +2 Hours	High end of range	217.3	ng/mg	90 - 230
Cortisone (U3) - Dinner	Above range	119.4	ng/mg	32 - 110
Cortisone (U4) - Bedtime	Within range	41.5	ng/mg	0 - 55
24 Hour Free Cortisol (Sum of all Values)	Above range	251.4	ng/mg	65 - 200
24 Hour Free Cortisone (Sum of all Values)	High end of range	433.2	ng/mg	220 - 450
Creatinine (Urine)				
Creatinine (U1) - Waking	Within range	1.34	mg/ml	0.2 - 2
Creatinine (U2) - +2 Hours	Within range	0.80	mg/ml	0.2 - 2
Creatinine (U3) - Dinner	Within range	1.21	mg/ml	0.2 - 2
Creatinine (U4) - Bedtime	Within range	1.40	mg/ml	0.2 - 2
Cortisol Metabolites and DHEA-S (Urine)				
a-Tetrahydrocortisol (a-THF)	Within range	180.0	ng/mg	75 - 370
b-Tetrahydrocortisol (b-THF)	Low end of range	1315.1	ng/mg	1050 - 2500
b-Tetrahydrocortisone (b-THE)	Within range	2333.7	ng/mg	1550 - 3800
Metabolized Cortisol (THF + THE)	Within range	3829.0	ng/mg	2750 - 6500
DHEA-S	Within range	532.5	ng/mg	20 - 750
Cortisol Clearance Rate (CCR)	Below range	5.7		6 - 12.5

Organic Acid Tests (OATs)

TEST		RESULT	UNITS	NORMAL RANGE
Nutritional Organic Acids (Urine)				
Vitamin B12 Marker - May be deficient if high				
Methylmalonate (MMA)	Within range	1.3	ug/mg	0 - 2.5
Vitamin B6 Markers - May be deficient if high				
Xanthurenate	Within range	0.42	ug/mg	0.12 - 1.2
Kynurenate	Within range	2.0	ug/mg	0.8 - 4.5
Biotin Marker - May be deficient if high				
b-Hydroxyisovalerate	Within range	4.3	ug/mg	0 - 12.5
Glutathione Marker - May be deficient if high				
Pyroglutamate	Within range	31.4	ug/mg	28 - 58
Gut Marker - Potential gut putrefaction or dysbiosis if high				
Indican	Within range	37.5	ug/mg	0 - 100
Neuro-Related Markers (Urine)				
Dopamine Metabolite				
Homovanillate (HVA)	Within range	4.4	ug/mg	3 - 11
Norepinephrine/Epinephrine Metabolite				
Vanilmandelate (VMA)	Within range	3.5	ug/mg	2.2 - 5.5
Neuroinflammation Marker				
Quinolinate	Within range	4.1	ug/mg	0 - 9.6
Additional Markers (Urine)				
Melatonin - Waking				
6-OH-Melatonin-Sulfate	Within range	28.0	ng/mg	10 - 85
Oxidative Stress / DNA Damage				
8-Hydroxy-2-deoxyguanosine (8-OHdG)	Within range	2.4	ng/mg	0 - 5.2

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:

- This DUTCH test is associated with a Cycle Mapping report. The progesterone and estrogen metabolite values in this report are based on the Cycle Mapping sample with the highest b-pregnandiol (the primary progesterone metabolite) level.
- The patient reports regular menstrual cycles.

#1. Assess estrogen levels given the patient's reproductive status

- Estradiol (the most potent estrogen is **2.15 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

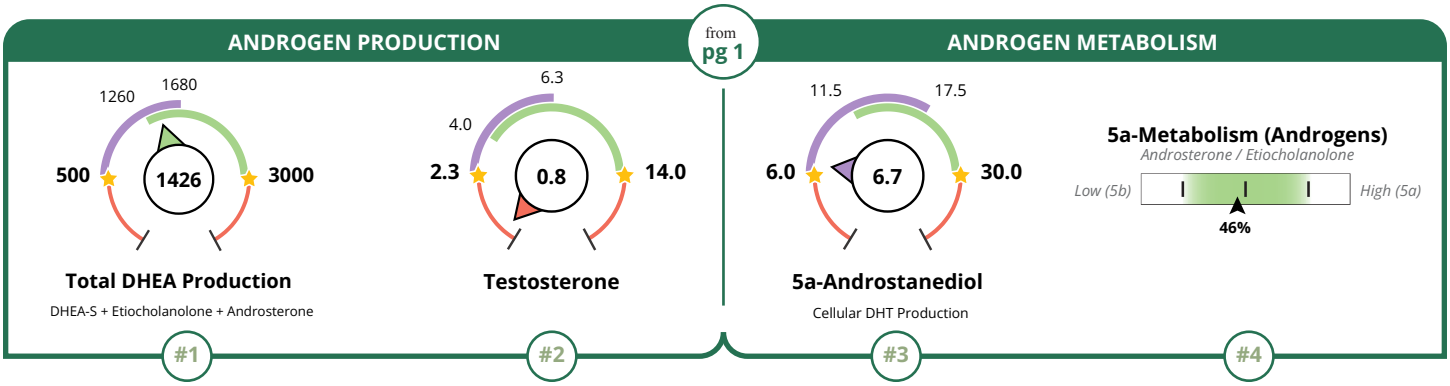
- The progesterone serum equivalent is **8.2 ng/mL**, which is within the optimal luteal range, but toward the lower end. This indicates that the patient ovulated, but progesterone may be suboptimal. If paired with high E2, this may contribute to estrogen excess symptoms.

#3. Assess 2-OH preference in phase 1 estrogen metabolism

- The 2-OH/16-OH-E1 is higher than only **14.0%** of the population, which is below the optimal range. This indicates a preference for the estrogenic 16-OH-E1 metabolite compared to the beneficial 2-OH-E1 metabolite. The 16-OH preference may be associated with estrogenic activity and high estrogen symptoms.
- 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 reactive 2-OH catechol estrogens

- The methylation activity is higher than **94.0%** of the population, which is above the optimal range. This indicates fast estrogen methylation, which is beneficial for efficient estrogen detoxification.



Androgen-related Patient or Sample Comments:

#1. Assess adrenal androgen levels (Total DHEA)

- The total DHEA production is **1,426 ng/mg**, which is within the premenopausal range, but towards the lower end. If paired with low testosterone or low 5a-androstanediol, this may contribute to low androgen symptoms. These three 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

- Testosterone is **0.81 ng/mg**, which is below the overall range, meaning it is low for women of any age. If paired with low 5a-androstanediol, this may contribute to low androgen symptoms. Consider testing serum testosterone to confirm testosterone levels before initiating treatment. 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.

- When testosterone is low and relatively lower than the other androgens on this page, urine testosterone may underestimate serum levels, especially when epi-testosterone levels are higher than testosterone. See advanced insights comments (androgens #2) or this video.

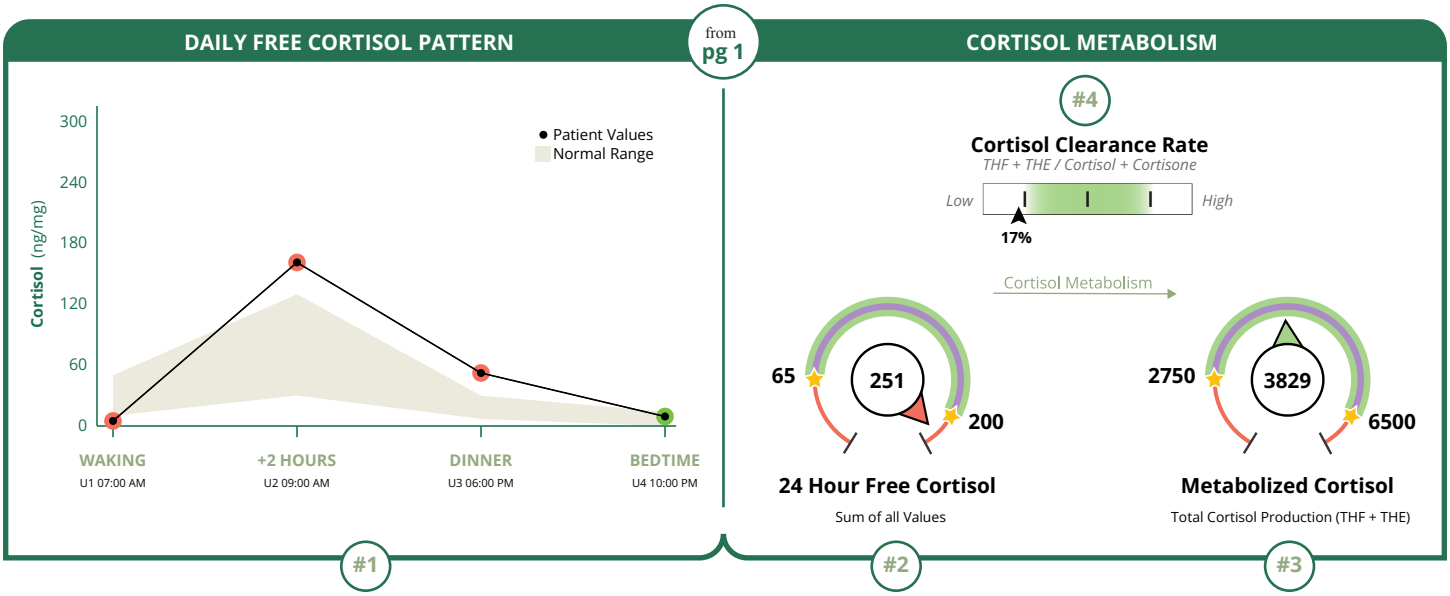
#3. Assess cellular production of 5a-DHT via 5a-androstanediol

- 5a-Androstanediol is **6.7 ng/mg**, which is below the optimal premenopausal range but within the overall 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

- 5a-Metabolism of androgens is higher than **46.0%** of the population, which is within the range. This indicates balanced metabolism of androgens.

About Your Results | Cortisol



Cortisol-related Patient or Sample Comments:

#1. Assess the daily free cortisol pattern

- One or more points on the Daily 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.

#2. Assess the daily total of free cortisol in circulation (24hr Free Cortisol)

- The 24hr Free Cortisol is **251 ng/mg**, which is above the optimal range. This indicates high free cortisol levels.

#3. Assess the total cortisol produced by the adrenal glands (Metabolized Cortisol)

- The Metabolized Cortisol, which reflects the total cortisol output for the day, is **3,829 ng/mg**, which is within the optimal range.

#4. Assess the rate of cortisol clearance from the body

- The Cortisol Clearance Rate is higher than only **17.0%** of the population, which is below the optimal range. This indicates that cortisol and cortisone are being metabolized at a slower rate than expected. If paired with high free cortisol, this can contribute to high cortisol symptoms.

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 16-OH-E1 add more insight into overall estrogenic activity

While E2 is the most potent estrogen, other estrogens - such as estrone (E1), 16-hydroxyestrone (16-OH-E1), and estriol (E3) - also contribute to overall estrogenic activity.

E1 is less potent than E2 but can still impact total estrogenic load and can be converted to E2 as needed. 16-OH-E1 is weaker than E2 but may exert significant estrogenic effects, depending on the tissue in which it is produced. E3 is a weak estrogen with mild estrogenic effects and may have anti-inflammatory properties.

Higher levels of these additional estrogens relative to E2 may enhance overall estrogenic activity, while lower levels may result in reduced estrogenic effects.

- For this patient, the E1 levels are relatively higher with respect to the range, compared to E2. To the degree that this is true, the patient's estrogenic load may be higher than implied by the E2 result in isolation.
- For this patient, the 16-OH-E1 levels are relatively higher with respect to the range, compared to E2. To the degree that this is true, the patient's estrogenic load may be higher than implied by the E2 result in isolation.
- For this patient, the E3 levels are higher with respect to the range, compared to E2. Because E3 has weak activity at the estrogen receptor, the significance of this finding may depend on the specific scenario.

#2. Assess if there is a preference for alpha metabolism of progesterone

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 **32.0%** 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

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.

#4. Assess whether any of the estrogen-related organic acids are out of range

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.

ANDROGENS

#1. Assess if the DHEA-S is relatively lower than the Total DHEA

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)

- This advanced topic is usually only relevant if the patient has low testosterone on the DUTCH Test and may be relevant in this case. For information on this topic, see this video

  A specific enzyme called UGT2B17, is primarily responsible for the process (glucuronidation) of how testosterone, but not epi-testosterone is excreted in the urine. When testosterone is low and epi-testosterone is higher, urine might show low testosterone levels when actual testosterone levels in the body are normal, especially if 5a-androstanediol and Total DHEA Production are normal. Some people have a genetic variation affecting this testosterone metabolizing enzyme which impacts how the body gets rid of testosterone, as well as 5a-DHT and 5b-androstanediol in urine.

  If this variant enzyme is present, it does not mean anything is wrong. It just makes urine results less reliable in some people and serum testing (checking free and total testosterone) should be considered prior to initiating treatment of low testosterone. Epi-testosterone, 5a-androstanediol, and the other androgens are processed (glucuronidated) by different enzymes, making them helpful in this analysis.

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

5a-DHT is testosterone's active metabolite and is three times more potent than testosterone. If elevated it may contribute to androgen excess syptoms. 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

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

Cortisol is an active adrenal glucocorticoid, while cortisone is an inactive "storage" form. In the kidney, a significant amount of cortisol is converted to cortisone before excretion into urine. Therefore, urinary 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 urinary 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 urinary free cortisol implies.

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

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 **24.0%** of the population, which is within the optimal range, but towards the low end. This indicates a mild preference for 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

Androgens such as DHEA (assessed as total DHEA or DHEA-S) support tissue growth and repair, while cortisol promotes tissue breakdown. When total DHEA (or DHEA-S) is significantly higher than cortisol, it may suggest an anabolic state (favoring tissue building and repair). When total DHEA (or DHEA-S) is significantly lower than cortisol, it may suggest a catabolic state (favoring tissue breakdown).

#4. Assess whether any of the cortisol-related organic acids are out of range

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 U0 (Mid-Sleep)	0	90%	0	15
a-Pregnanediol	20%	90%	200	740	Cortisol U1 (Waking)	20%	90%	10	50
Estrone (E1)	20%	80%	12	26	Cortisol U2 (+2 Hours)	20%	90%	30	130
Estradiol (E2)	20%	80%	1.8	4.5	Cortisol U3 (Dinner)	20%	90%	7	30
Estriol (E3)	20%	80%	5	18	Cortisol U4 (Bedtime)	0	90%	0	14
2-OH-E1	20%	80%	5.1	13.1	Cortisone U0 (Mid-Sleep)	0	90%	0	14
4-OH-E1	0	80%	0	1.8	Cortisone U1 (Waking)	20%	90%	40	120
16-OH-E1	20%	80%	0.7	2.6	Cortisone U2 (Morning)	20%	90%	90	230
2-Methoxy-E1	20%	80%	2.5	6.5	Cortisone U3 (Dinner)	20%	90%	32	110
2-OH-E2	0	80%	0	3.1	Cortisone U4 (Bedtime)	0	90%	0	55
4-OH-E2	0	80%	0	0.52	Cortisol Clearance Rate (CCR)	20%	80%	6	12.5
2-16-ratio	20%	80%	2.69	11.83	Melatonin (6-OHMS)	20%	90%	10	85
2-4-ratio	20%	80%	5.4	12.62	8-OHdG	0	90%	0	5.2
2Me-2OH-ratio	20%	80%	0.39	0.67	Methylmalonate	0	90%	0	2.5
DHEA-S	20%	90%	20	750	Xanthurenate	0	90%	0.12	1.2
Androsterone	20%	80%	200	1650	Kynurenate	0	90%	0.8	4.5
Etiocholanolone	20%	80%	200	1000	b-Hydroxyisovalerate	0	90%	0	12.5
Testosterone	20%	80%	2.3	14	Pyroglutamate	10%	90%	28	58
5a-DHT	0	80%	0	6.6	Indican	0	90%	0	100
5a-Androstanediol	20%	80%	6	30	Homovanillate	10%	95%	3	11
5b-Androstanediol	20%	80%	12	75	Vanilmandelate	10%	95%	2.2	5.5
Epi-Testosterone	20%	80%	2.3	14	Quinolinate	0	90%	0	9.6
a-THF	20%	90%	75	370	**Calculated Values**				
b-THF	20%	90%	1050	2500	Total DHEA Production	20%	80%	500	3000
b-THE	20%	90%	1550	3800	Total Estrogens	20%	80%	35	70
					Metabolized Cortisol	20%	90%	2750	6500
					24hr Free Cortisol	20%	90%	65	200
					24hr Free Cortisone	20%	90%	220	450

% = 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."