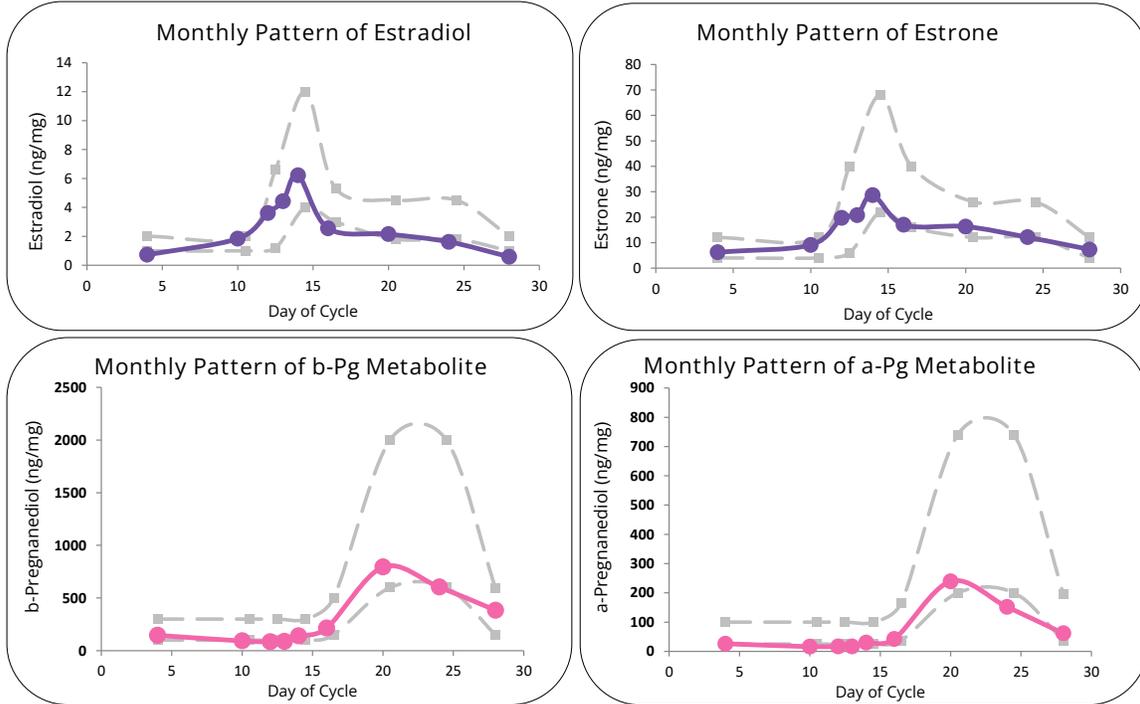


Estrogen (E) patterns can be seen below in purple. Progesterone (Pg) patterns can be seen below in pink. Normal ranges are within the gray dashed lines. See page 2 for more information.



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 |

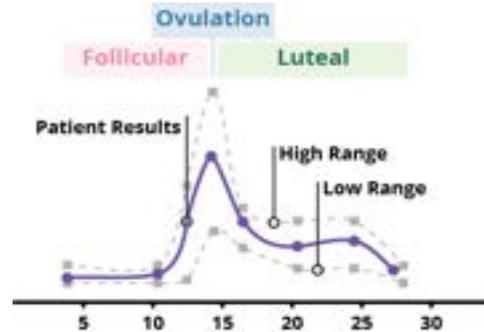
Sample (#7) with the highest b-Pg value (794) is used for E and Pg metabolites for DUTCH Complete or Plus if ordered.

| 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.

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.

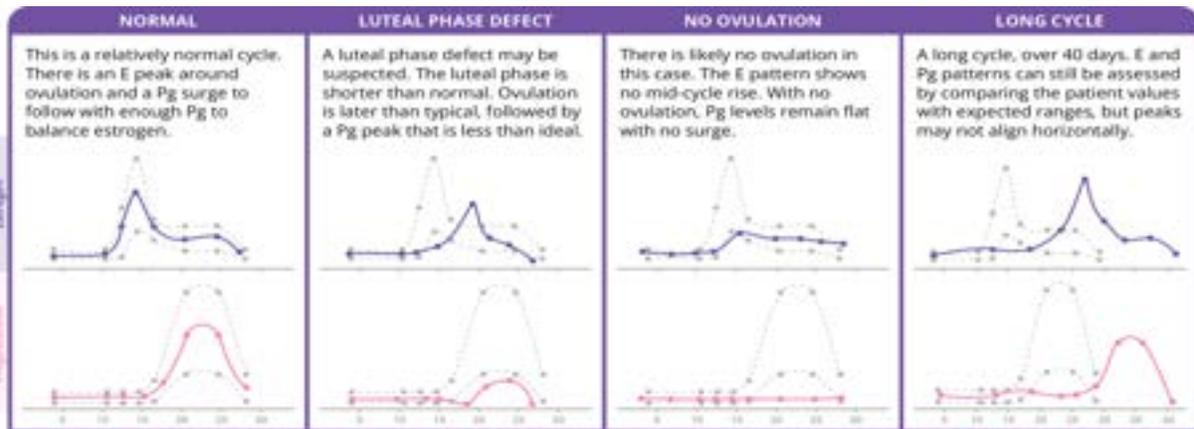


For most cycles <34 days, measurements are made from single days, selected to best represent overall patterns of ovulatory & luteal peaks. The day 4 sample set is usually collected at the end of the cycle, four days after menses (used for DUTCH Complete/Plus), but is plotted at the beginning of the cycle 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.

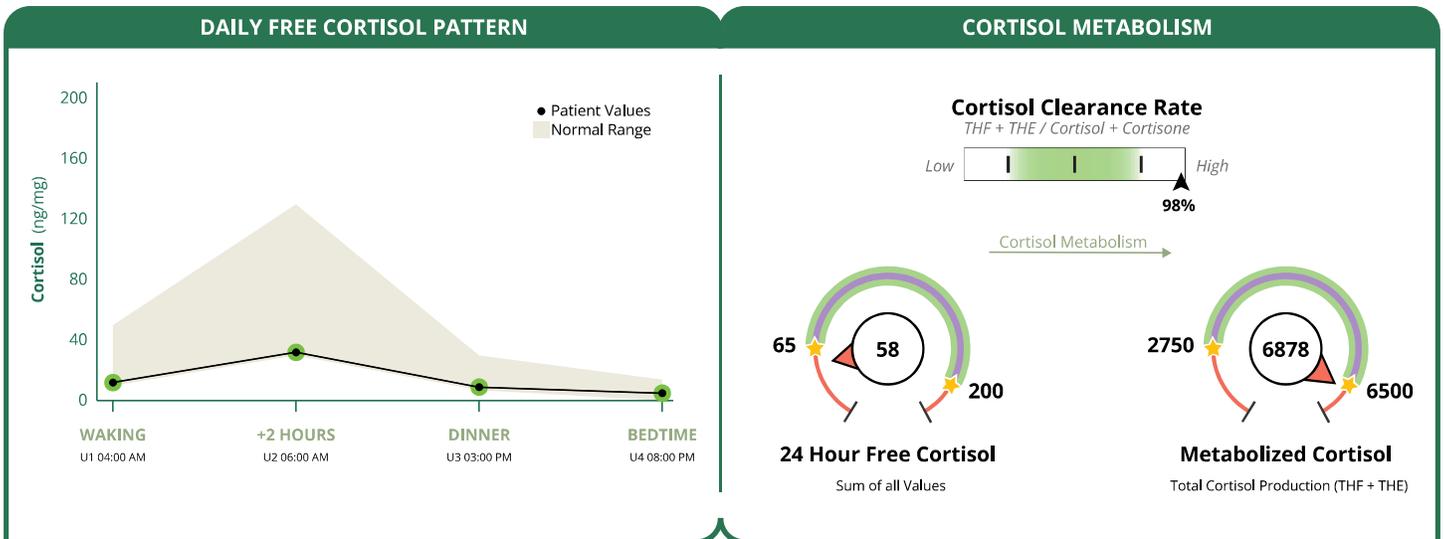
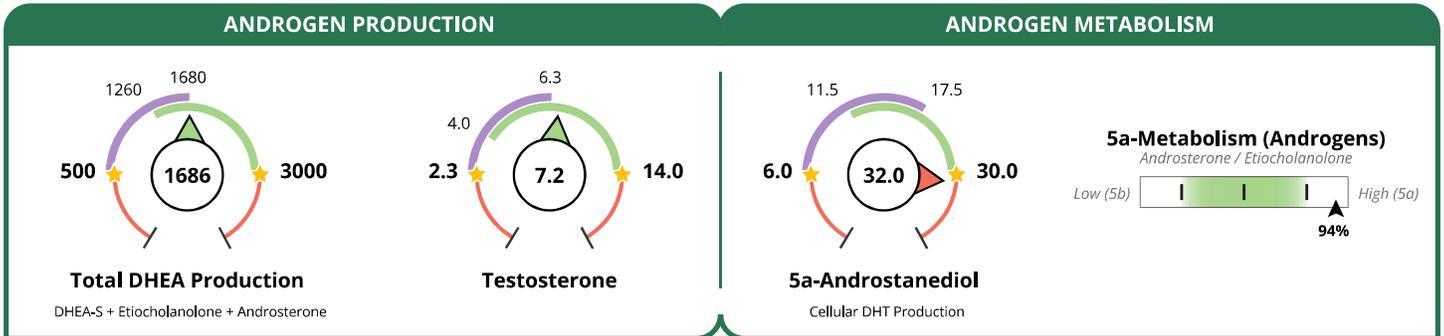
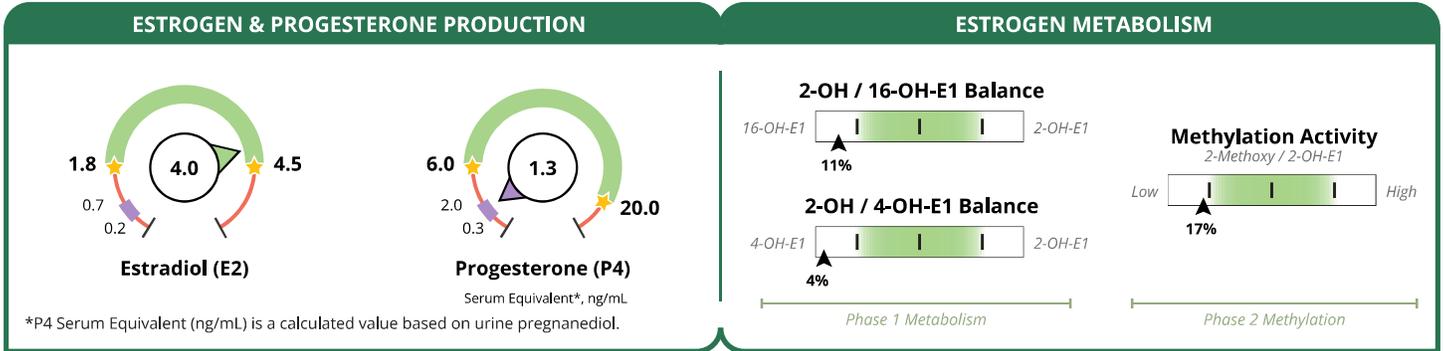
Below are four different cycle patterns that may help with interpretation ([video tutorial here](#))



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.

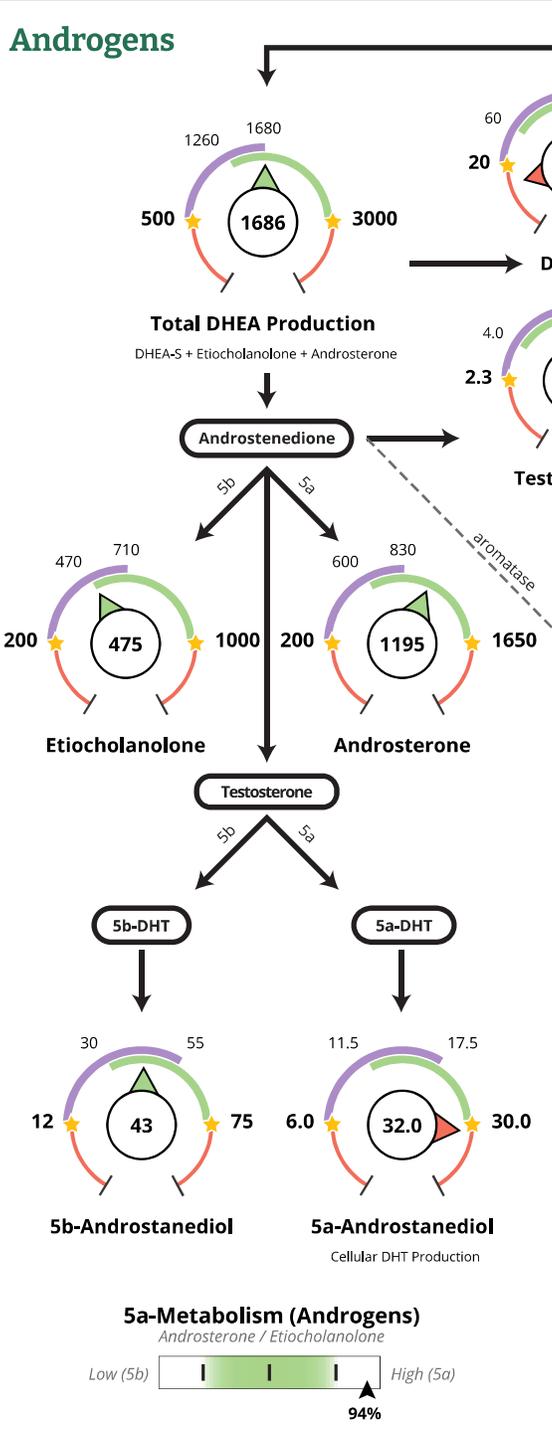


Organic Acid Tests (OATs) Suggests the Following Possible Imbalances | see page 6 for details

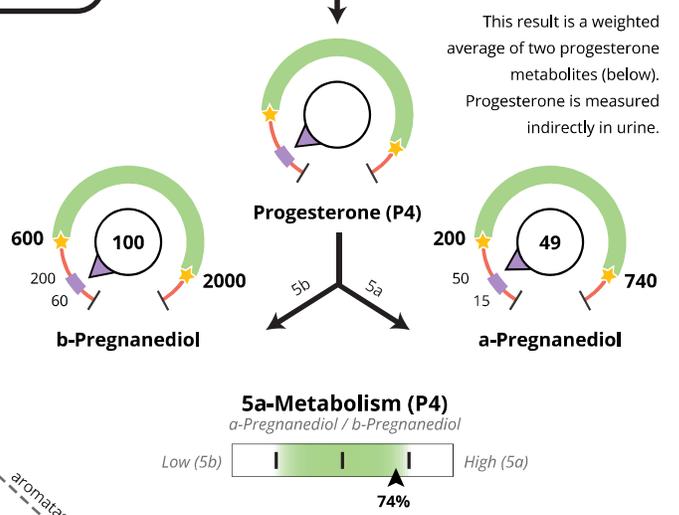
● Watch ● Needs Attention

- B12 Deficiency
- B6 Deficiency
- GI Dysbiosis
- Melatonin

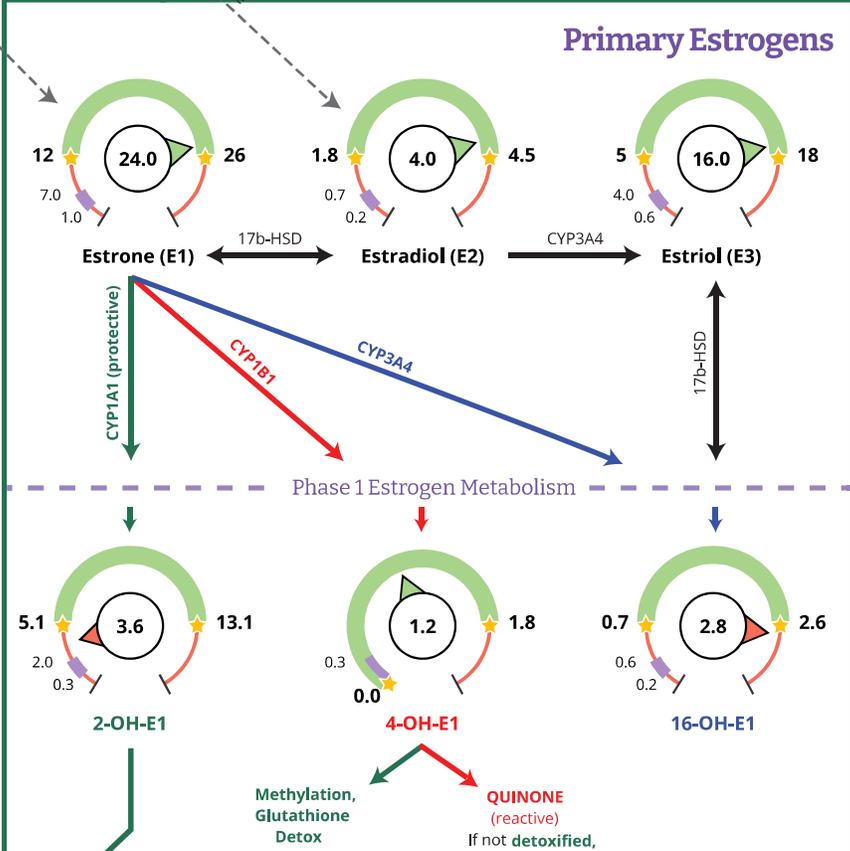
Androgens



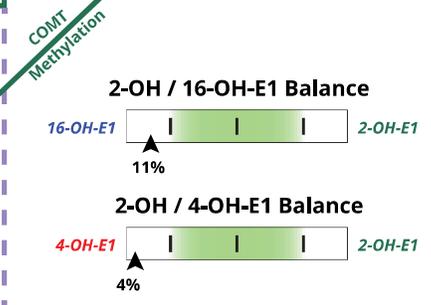
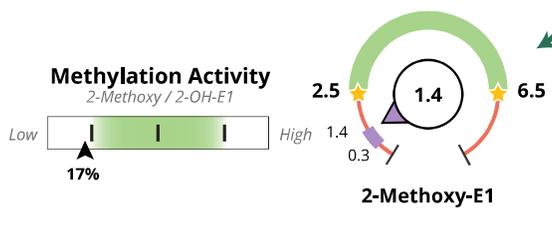
Progesterone



Primary Estrogens



Phase 2 Estrogen Metabolism



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](#).



Accession # 01093510

Female Sample Report
123 A Street
Sometown, SC 90266

DOB: 1976-01-01

Age: 49

Sex: Female

Last Menstrual Period:

2025-05-26

Collection Times:

2025-06-13 04:00AM (U1)
2025-06-13 06:00AM (U2)
2025-06-12 03:00PM (U3)
2025-06-12 08:00PM (U4)

Ordering Provider:

Test Provider MD

Sex Hormones & Metabolites

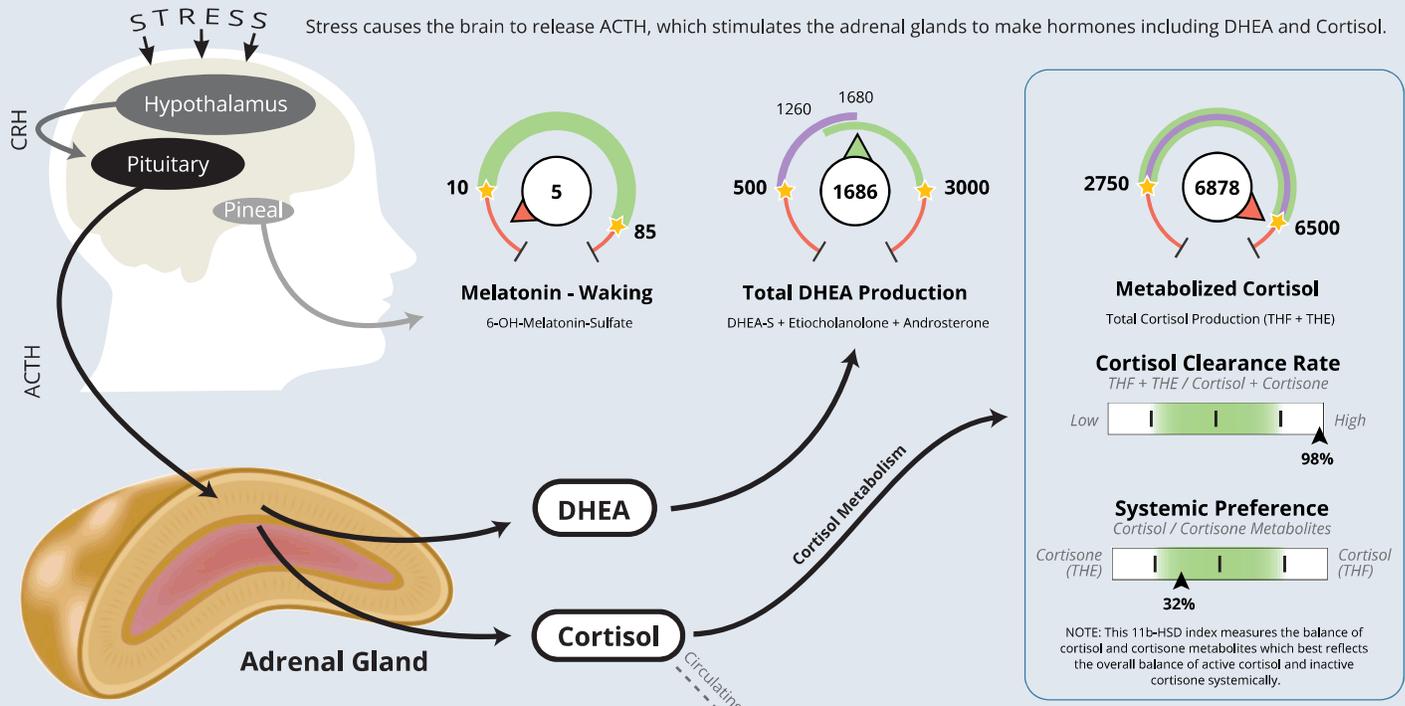
| TEST | | RESULT | UNITS | LUTEAL* | POSTMENOPAUSAL |
|--|--------------------------|--------|-------|--------------|----------------|
| Progesterone Metabolites (Urine) | | | | | |
| b-Pregnanediol | Below luteal range | 100.0 | ng/mg | 600 - 2000 | 60 - 200 |
| a-Pregnanediol | Below luteal range | 49.0 | ng/mg | 200 - 740 | 15 - 50 |
| Estrogens and Metabolites (Urine) | | | | | |
| Estrone (E1) | High end of luteal range | 24.01 | ng/mg | 12 - 26 | 1.0 - 7.0 |
| Estradiol (E2) | High end of luteal range | 4.00 | ng/mg | 1.8 - 4.5 | 0.2 - 0.7 |
| Estriol (E3) | High end of luteal range | 16.0 | ng/mg | 5 - 18 | 0.6 - 4.0 |
| 2-OH-E1 | Below luteal range | 3.58 | ng/mg | 5.1 - 13.1 | 0.3 - 2.0 |
| 4-OH-E1 | Within luteal range | 1.20 | ng/mg | 0 - 1.8 | 0 - 0.3 |
| 16-OH-E1 | Above luteal range | 2.80 | ng/mg | 0.7 - 2.6 | 0.2 - 0.6 |
| 2-Methoxy-E1 | Below luteal range | 1.35 | ng/mg | 2.5 - 6.5 | 0.3 - 1.4 |
| 2-OH-E2 | Within luteal range | 0.74 | ng/mg | 0 - 3.1 | 0 - 0.52 |
| 4-OH-E2 | Within luteal range | 0.41 | ng/mg | 0 - 0.52 | 0 - 0.12 |
| Total Estrogen | Within range | 54.1 | ng/mg | 35 - 70 | 3.5 - 15 |
| Metabolite Ratios (Urine) | | | | | |
| 2-OH / 16-OH-E1 Balance | Below range | 1.28 | ratio | 2.69 - 11.83 | |
| 2-OH / 4-OH-E1 Balance | Below range | 2.98 | ratio | 5.4 - 12.62 | |
| 2-Methoxy / 2-OH Balance | Below range | 0.38 | ratio | 0.39 - 0.67 | |
| Androgens and Metabolites (Urine) | | | | Range | |
| DHEA-S | Below range | 16.0 | ng/mg | 20 - 750 | |
| Androsterone | Within range | 1195.0 | ng/mg | 200 - 1650 | |
| Etiocholanolone | Within range | 474.6 | ng/mg | 200 - 1000 | |
| Testosterone | Within range | 7.16 | ng/mg | 2.3 - 14 | |
| 5a-DHT | Within range | 6.2 | ng/mg | 0 - 6.6 | |
| 5a-Androstanediol | Above range | 32.0 | ng/mg | 6 - 30 | |
| 5b-Androstanediol | Within range | 42.6 | ng/mg | 12 - 75 | |
| Epi-Testosterone | Within range | 8.6 | 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

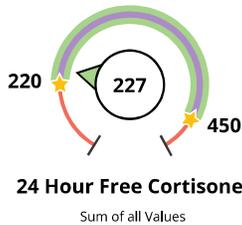
● Optimal Luteal Range ● Postmenopausal Range ● Out of Range ★ Edge of Range



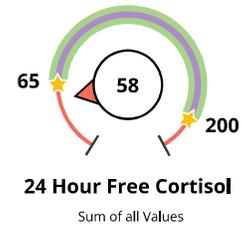
Daily Free Cortisone Pattern



Daily Free Cortisol Pattern



Cortisol and Cortisone interconvert (11β-HSD)





Accession # 01093510

Female Sample Report
 123 A Street
 Sometown, SC 90266

DOB: 1976-01-01

Age: 49

Sex: Female

Last Menstrual Period:

2025-05-26

Collection Times:

2025-06-13 04:00AM (U1)
 2025-06-13 06:00AM (U2)
 2025-06-12 03:00PM (U3)
 2025-06-12 08:00PM (U4)

Ordering Provider:

Test Provider MD

Adrenal Hormones & Metabolites

| TEST | | RESULT | UNITS | NORMAL RANGE |
|--|------------------|--------|-------|--------------|
| Daily Free Cortisol and Cortisone (Urine) | | | | |
| Cortisol (U1) - Waking | Low end of range | 12.0 | ng/mg | 10 - 50 |
| Cortisol (U2) - +2 Hours | Low end of range | 32.0 | ng/mg | 30 - 130 |
| Cortisol (U3) - Dinner | Low end of range | 9.0 | ng/mg | 7 - 30 |
| Cortisol (U4) - Bedtime | Within range | 5.0 | ng/mg | 0 - 14 |
| Cortisone (U1) - Waking | Low end of range | 50.0 | ng/mg | 40 - 120 |
| Cortisone (U2) - +2 Hours | Low end of range | 110.0 | ng/mg | 90 - 230 |
| Cortisone (U3) - Dinner | Within range | 52.0 | ng/mg | 32 - 110 |
| Cortisone (U4) - Bedtime | Within range | 15.0 | ng/mg | 0 - 55 |
| 24 Hour Free Cortisol (Sum of all Values) | Below range | 58.0 | ng/mg | 65 - 200 |
| 24 Hour Free Cortisone (Sum of all Values) | Low end of range | 227.0 | ng/mg | 220 - 450 |
| Creatinine (Urine) | | | | |
| Creatinine (U1) - Waking | Within range | 0.50 | mg/ml | 0.2 - 2 |
| Creatinine (U2) - +2 Hours | Within range | 0.72 | mg/ml | 0.2 - 2 |
| Creatinine (U3) - Dinner | Within range | 0.48 | mg/ml | 0.2 - 2 |
| Creatinine (U4) - Bedtime | Within range | 0.34 | mg/ml | 0.2 - 2 |
| Cortisol Metabolites and DHEA-S (Urine) | | | | |
| a-Tetrahydrocortisol (a-THF) | Above range | 464.0 | ng/mg | 75 - 370 |
| b-Tetrahydrocortisol (b-THF) | Within range | 2318.9 | ng/mg | 1050 - 2500 |
| b-Tetrahydrocortisone (b-THE) | Above range | 4095.1 | ng/mg | 1550 - 3800 |
| Metabolized Cortisol (THF + THE) | Above range | 6878.0 | ng/mg | 2750 - 6500 |
| DHEA-S | Below range | 16.0 | ng/mg | 20 - 750 |
| Cortisol Clearance Rate (CCR) | Above range | 24.1 | | 6 - 12.5 |

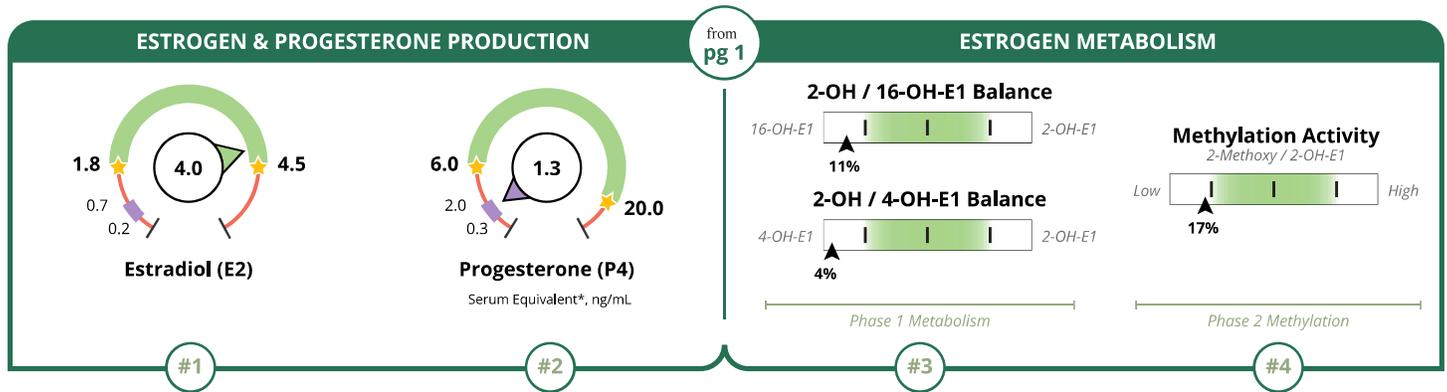
Organic Acid Tests (OATs)

| TEST | RESULT | UNITS | NORMAL RANGE |
|--|--------------|-------|------------------|
| Nutritional Organic Acids (Urine) | | | |
| Vitamin B12 Marker - May be deficient if high | | | |
| Methylmalonate (MMA) | Above range | 4.9 | ug/mg 0 - 2.5 |
| Vitamin B6 Markers - May be deficient if high | | | |
| Xanthurenate | Above range | 1.23 | ug/mg 0.12 - 1.2 |
| Kynurenate | Above range | 5.4 | ug/mg 0.8 - 4.5 |
| Biotin Marker - May be deficient if high | | | |
| b-Hydroxyisovalerate | Within range | 7.9 | ug/mg 0 - 12.5 |
| Glutathione Marker - May be deficient if high | | | |
| Pyroglutamate | Within range | 42.0 | ug/mg 28 - 58 |
| Gut Marker - Potential gut putrefaction or dysbiosis if high | | | |
| Indican | Above range | 114.0 | 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 | 4.3 | ug/mg 2.2 - 5.5 |
| Neuroinflammation Marker | | | |
| Quinolinatate | Within range | 8.0 | ug/mg 0 - 9.6 |
| Additional Markers (Urine) | | | |
| Melatonin - Waking | | | |
| 6-OH-Melatonin-Sulfate | Below range | 5.3 | ng/mg 10 - 85 |
| Oxidative Stress / DNA Damage | | | |
| 8-Hydroxy-2-deoxyguanosine (8-OHdG) | Within range | 2.6 | 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 indican is above the range. This can indicate gut dysbiosis. Gut dysbiosis can affect estrogen metabolism, inflammation, and malabsorption of nutrients. Further GI testing may be indicated.
- 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:

- The patient reports regular menstrual cycles.
- The patient reported collecting samples on Cycle Day 18. Estrogen and progesterone levels would be expected to reflect luteal phase values if the onset of her next menstrual cycle occurred 4-10 days after sample collection.

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

- Estradiol (the most potent estrogen) is **4.00 ng/mg**, which is within the optimal luteal range, but toward the higher end. If paired with other elevated estrogen markers, poor estrogen metabolism, or suboptimal progesterone, this may contribute to estrogen excess symptoms.

#2. Assess progesterone levels given the patient's reproductive status

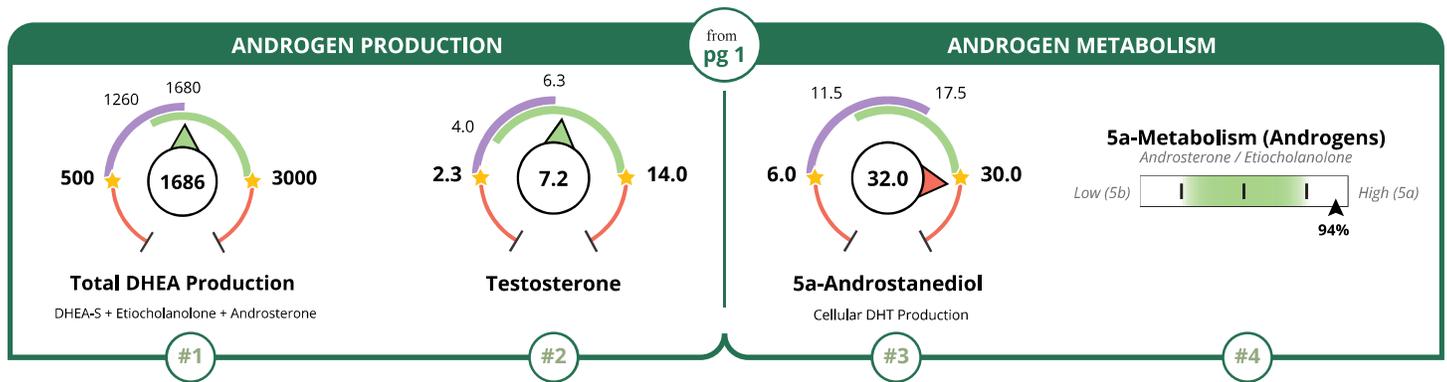
- The progesterone serum equivalent is **1.30 ng/mL**, which is below the optimal luteal range. This may indicate the patient did not ovulate or, if the patient ovulated, progesterone is suboptimal. Confirm that the patient's samples were collected in the luteal phase to interpret this result.
- The balance between progesterone and estradiol is assessed in the luteal phase, which is confirmed when progesterone is in the green range on the dial. In this case the progesterone is below the luteal range, so it is important to confirm sample timing relative to menses. The b-pregnanediol/E2 ratio is **25.0**, which is below the optimal range of 100-500. This can indicate progesterone may be suboptimal relative to estradiol, if peak progesterone was captured.

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

- The 2-OH/16-OH-E1 is higher than only **11.0%** 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 only **4.00%** of the population, which is below the optimal range. This indicates a preference for the potentially genotoxic (DNA damaging) 4-OH-E1 metabolite compared to the beneficial 2-OH-E1 metabolite. The 4-OH preference may be associated with oxidative stress.

#4. Assess methylation of reactive 2-OH catechol estrogens

- The methylation activity is higher than only **17.0%** 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.

#1. Assess adrenal androgen levels (Total DHEA)

- The total DHEA production is **1,686 ng/mg**, which is within the optimal premenopausal range. 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

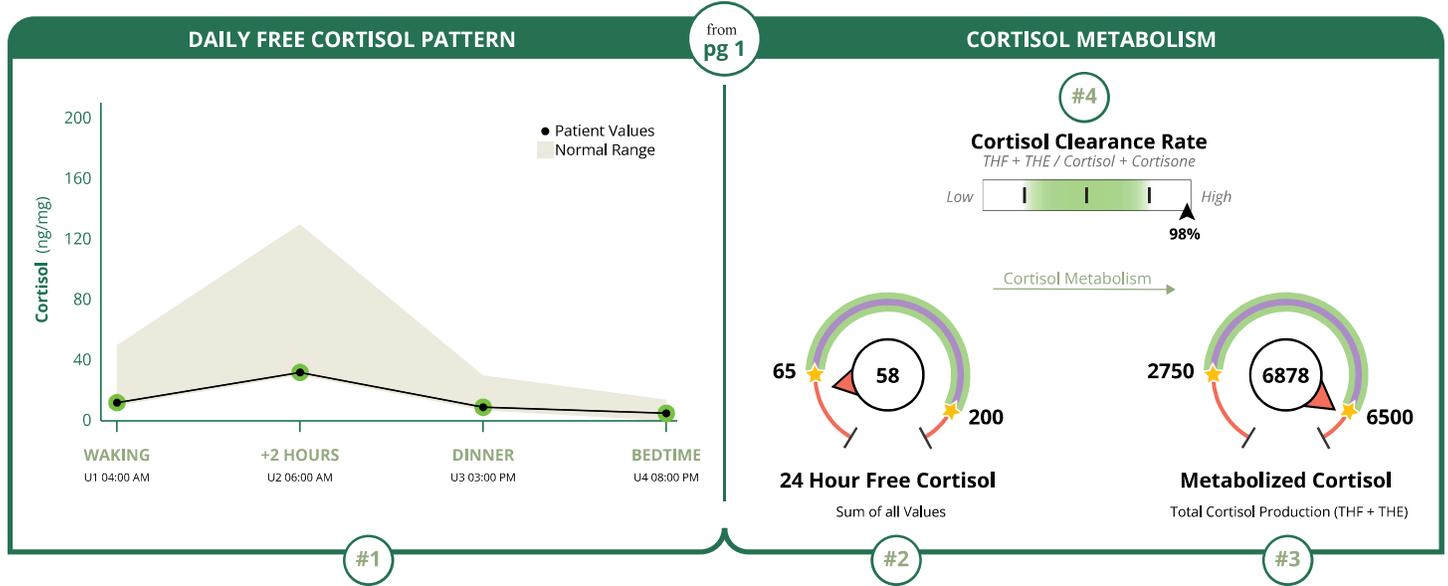
- Testosterone is **7.2 ng/mg**, which is within the optimal premenopausal range. In most cases, 25-50% of testosterone comes from the ovaries and the rest from adrenal androgen production (see above). Testosterone is a strong androgen and can become 3x more potent if metabolized to 5a-DHT (see below) within target tissue.

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

- 5a-Androstenediol is **32.0 ng/mg**, which is above the range for women of any age. 5a-Androstenediol reflects the tissue activity of 5a-DHT (the most potent androgen).

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

- The 5a-Metabolism of androgens is higher than **94.0%** of the population, which is above the range. This indicates a preference for the more androgenic pathway. If paired with high androgens, this may contribute to androgen excess symptoms.



Cortisol-related Patient or Sample Comments:

#1. Assess the daily free cortisol pattern

- All points on the Daily Free Cortisol Pattern are within the optimal range. Cortisol levels should follow a rhythm that is higher in the morning and lower at night.

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

- The 24hr Free Cortisol is **58.0 ng/mg**, which is below the optimal range. This indicates low 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 **6,878 ng/mg**, which is above the optimal range.

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

- The Cortisol Clearance Rate is higher than **98.0%** of the population, which is above the optimal range. This indicates that cortisol and cortisone are being metabolized at a faster rate than expected. If paired with low free cortisol, this can contribute to low cortisol symptoms.
- The patient reports that they have a BMI between 25 and 30. A higher BMI is associated with a fast cortisol clearance 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 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.

#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 **74.0%** 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 dysbiosis, 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 **4.90 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.
- Indican is **114 ug/mg**, which is above the optimal range. High urinary indican is a marker of dysbiosis (bacterial imbalance) and intestinal permeability. If paired with high E2 or suboptimal estrogen metabolism, this may contribute to poor estrogen detoxification through the GI tract.

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 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

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

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 **32.0%** of the population, which is within the optimal range. This indicates the balance between systemic cortisone and cortisol is normal.

#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).

About Your Results | Advanced Insights (continued)

#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-Pregnenediol | 20% | 90% | 600 | 2000 | Cortisol U0 (Mid-Sleep) | 0 | 90% | 0 | 15 |
| a-Pregnenediol | 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-Androstenediol | 20% | 80% | 6 | 30 | Homovanillate | 10% | 95% | 3 | 11 |
| 5b-Androstenediol | 20% | 80% | 12 | 75 | Vanilmandelate | 10% | 95% | 2.2 | 5.5 |
| Épi-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."