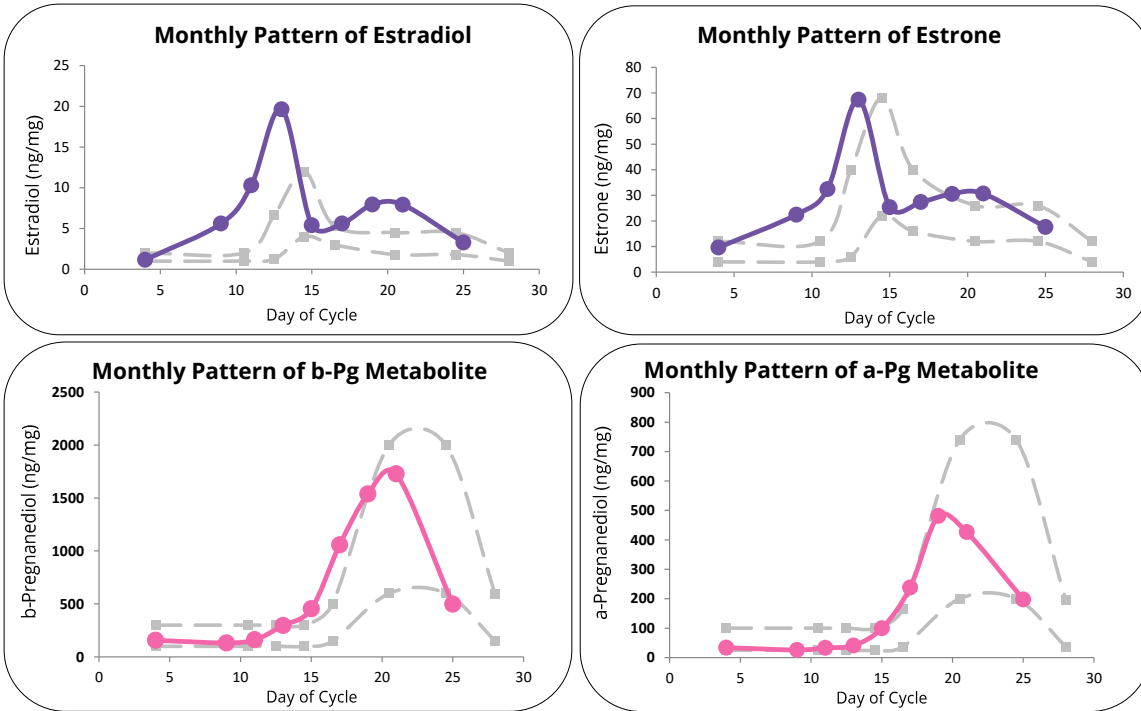


Estrogen (E) patterns can be seen below in purple. Progesterone (Pg) patterns can be seen below in pink. Normal ranges are within the gray dashed lines. See page 2 for more information.



All values given in ng/mg creatinine

| Measurement     | 1 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
|-----------------|---|---|----|----|----|----|----|----|----|
| Day(s) of Cycle | 4 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 25 |

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)          | 1.16 | 5.60 | 10.30 | 19.64 | 5.41 | 5.62 | 7.94 | 7.92        | 3.28 |
| Estrone (E1)            | 9.6  | 22.5 | 32.4  | 67.3  | 25.4 | 27.4 | 30.6 | 30.7        | 17.6 |
| a-Pregnanediol          | 34   | 26   | 33    | 41    | 99   | 238  | 481  | 426         | 197  |
| b-Pregnanediol          | 157  | 132  | 161   | 296   | 453  | 1057 | 1537 | <b>1727</b> | 496  |
| b-Pregnanediol/E2 Ratio | 135  | 24   | 16    | 15    | 84   | 188  | 194  | 218         | 151  |
| Creatinine              |      | 0.54 | 0.30  | 0.52  | 0.55 | 0.26 | 0.32 | 0.56        | 0.78 |

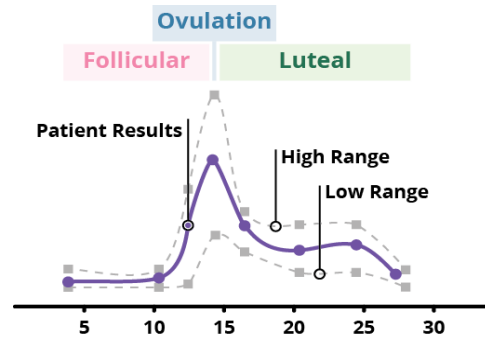
Sample (#8) with the highest b-Pg value (1727) is used for E and Pg metabolites for DUTCH Complete or Plus if ordered.

| 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](http://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 represent 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.

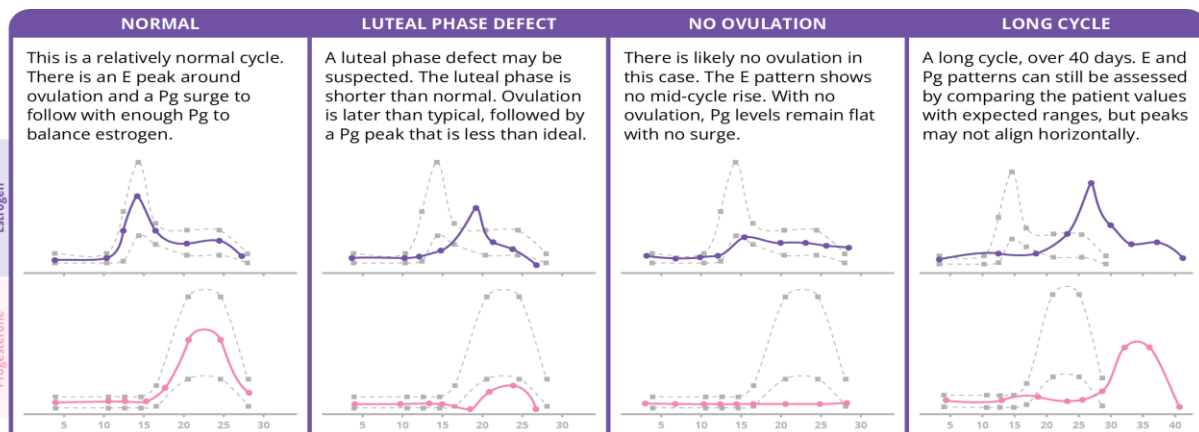


For most cycles <34 days, measurements are made from single days, selected to best represent overall patterns of ovulatory & luteal peaks. The day 4 sample set is usually collected at the end of the cycle, four days after menses (used for DUTCH Complete/Plus), but is plotted at the beginning of the cycle 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 2<sup>nd</sup> 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](#))



Ordering Provider:  
Test Provider MD

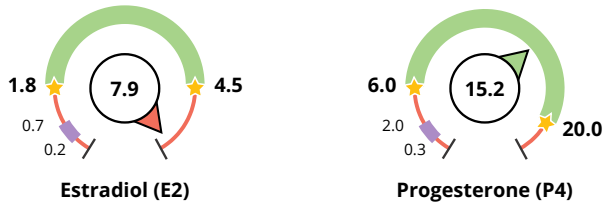
Female Sample Report

## Hormone Testing Summary

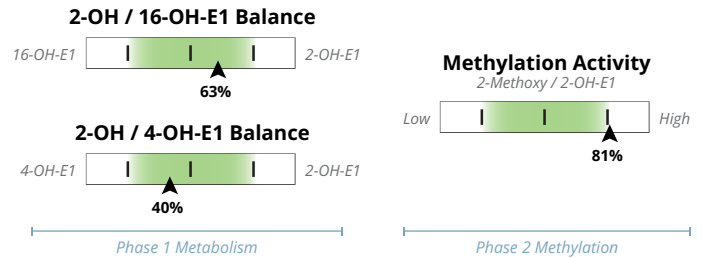
● Optimal Luteal Range ● Postmenopausal Range ● Out of Range ★ Edge of Range

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

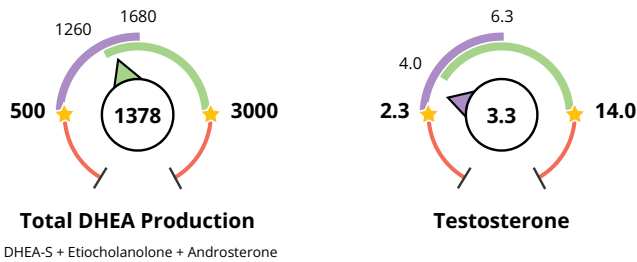
### ESTROGEN & PROGESTERONE PRODUCTION



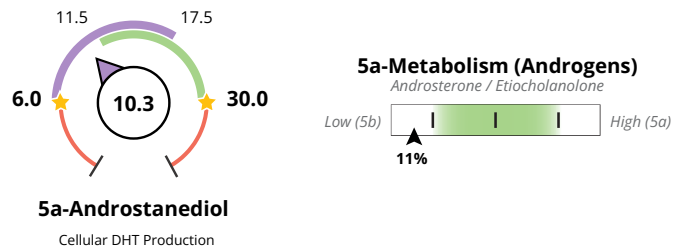
### ESTROGEN METABOLISM



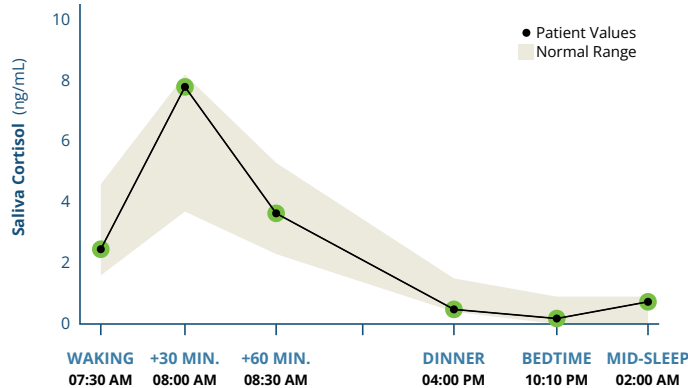
### ANDROGEN PRODUCTION



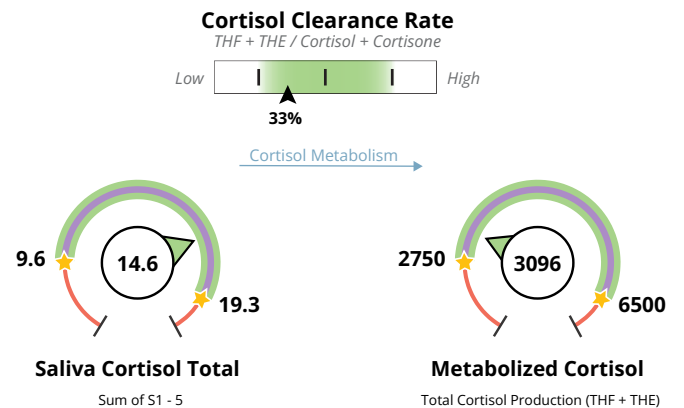
### ANDROGEN METABOLISM



### FREE CORTISOL with CORTISOL AWAKENING RESPONSE (CAR)



### CORTISOL METABOLISM

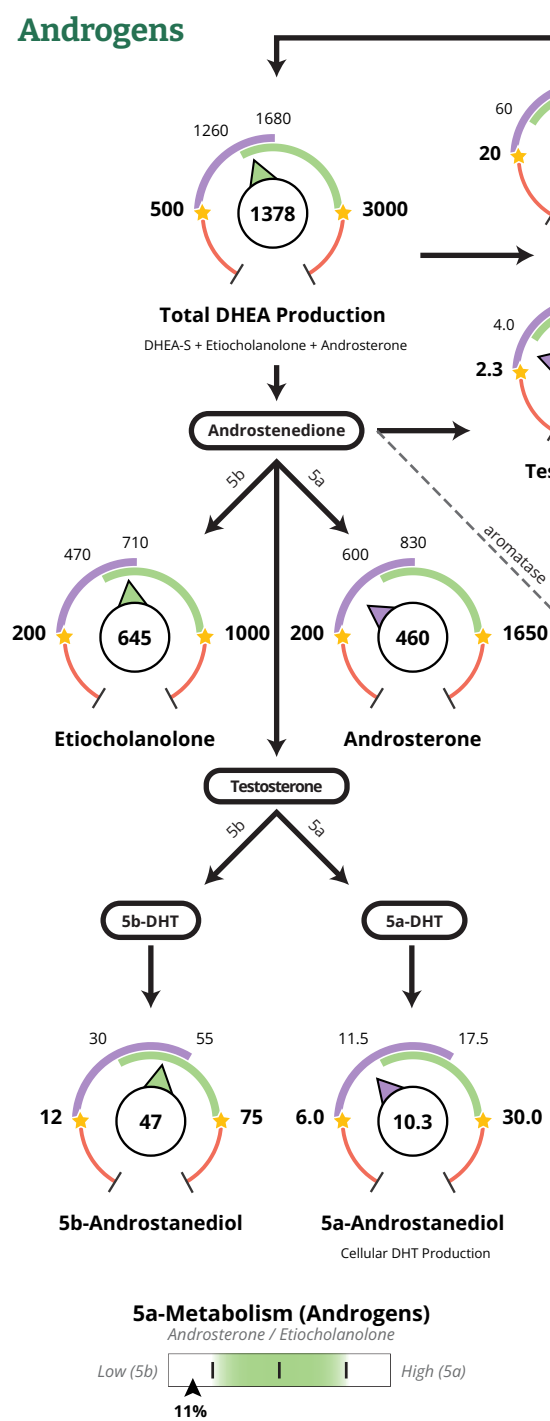


Organic Acid Tests (OATs) Suggests the Following Possible Imbalances | see page 6 for details

● Watch ● Needs Attention

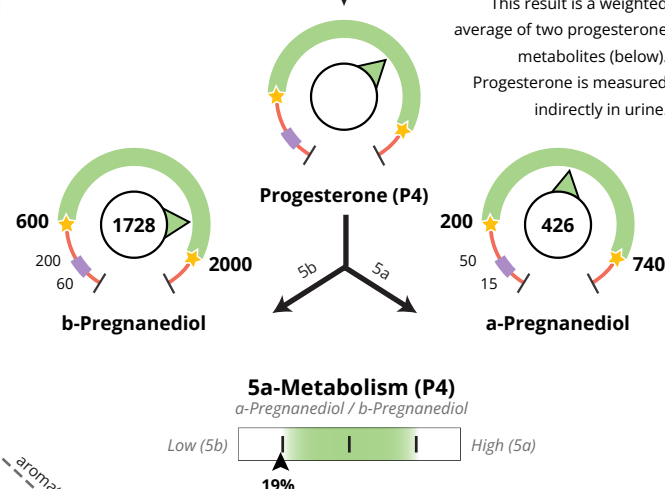
● Biotin Deficiency ● GI Dysbiosis

## Androgens

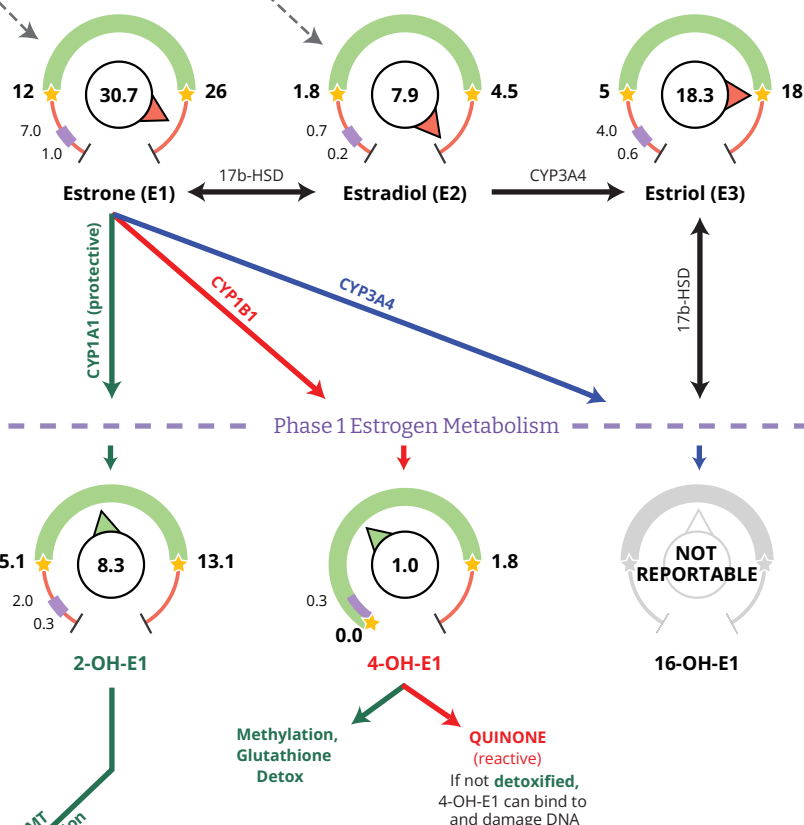


## Progesterone

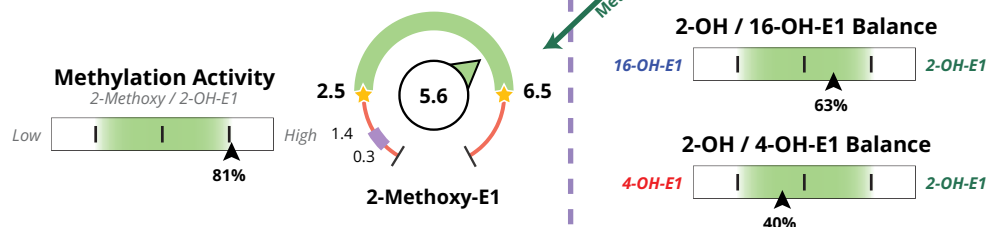
This result is a weighted average of two progesterone metabolites (below). Progesterone is measured indirectly in urine.



## Primary Estrogens



## Phase 2 Estrogen Metabolism



The three estrogen sliders show your result as a population percentile. The green center marks the normal range; results within or to the right are more favorable. Favoring the 2-OH pathway in Phase 1 and 2-methoxy in Phase 2 may have anti-estrogenic and antioxidant effects. 16-OH is more estrogenic; 4-OH is genotoxic.



Accession # 010411

Collection Times:

2025-08-11 02:00AM (S0)  
2025-08-10 07:30AM (S1)  
2025-08-10 08:00AM (S2)  
2025-08-10 08:30AM (S3)  
2025-08-10 04:00PM (S4)  
2025-08-10 10:10PM (S5)  
2025-08-10 07:30AM (U1)  
2025-08-10 10:05AM (U2)  
2025-08-10 04:10PM (U3)  
2025-08-10 10:00PM (U4)

Female Sample Report

DOB: 1990-01-01

Age: 35

Sex: Female

Last Menstrual Period:

2025-07-14

Ordering Provider:

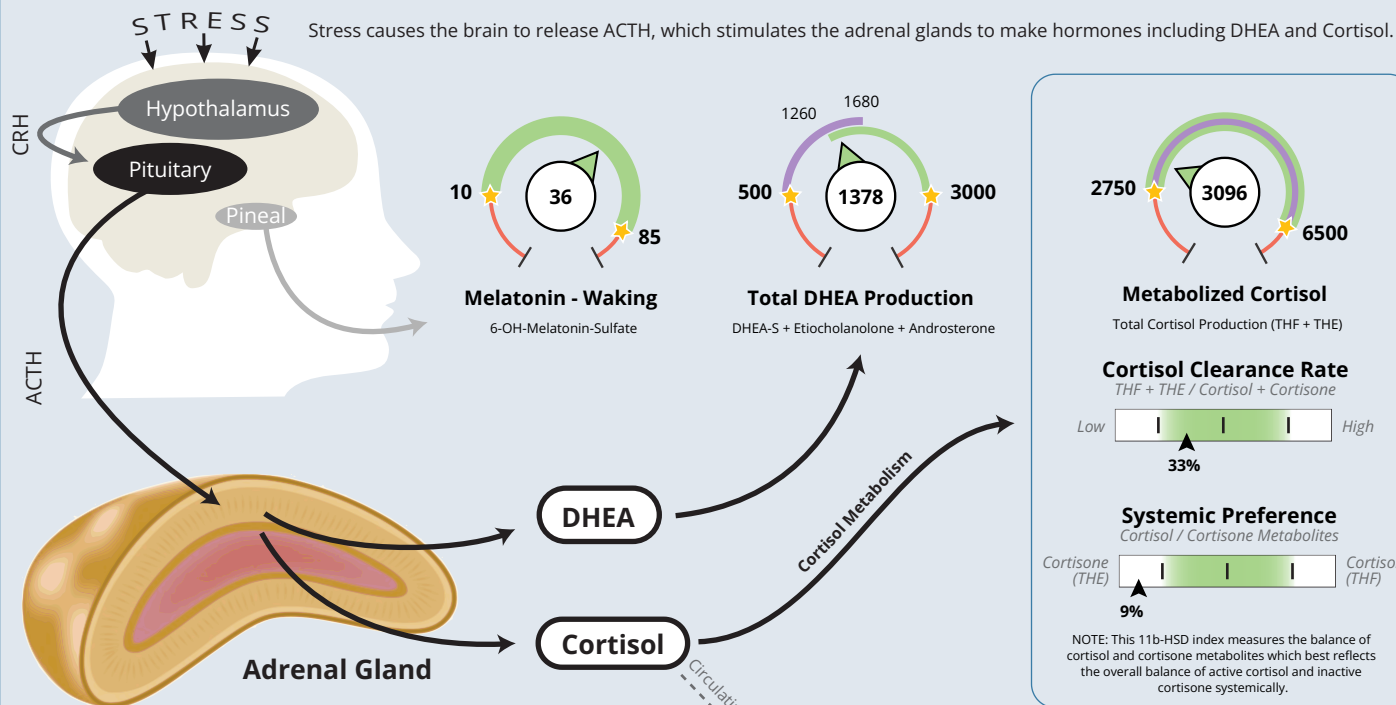
Test Provider MD

## Sex Hormones & Metabolites

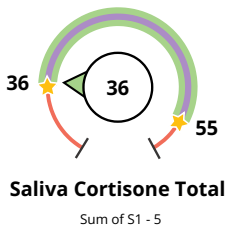
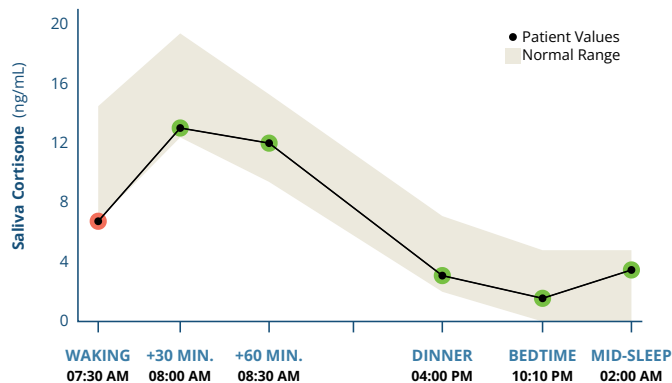
| TEST                              |                          | RESULT | UNITS | LUTEAL*      | POSTMENOPAUSAL |
|-----------------------------------|--------------------------|--------|-------|--------------|----------------|
| Progesterone Metabolites (Urine)  |                          |        |       |              |                |
| b-Pregnanediol                    | Within luteal range      | 1727.5 | ng/mg | 600 - 2000   | 60 - 200       |
| a-Pregnanediol                    | Within luteal range      | 426.2  | ng/mg | 200 - 740    | 15 - 50        |
| Estrogens and Metabolites (Urine) |                          |        |       |              |                |
| Estrone (E1)                      | Above luteal range       | 30.67  | ng/mg | 12 - 26      | 1.0 - 7.0      |
| Estradiol (E2)                    | Above luteal range       | 7.92   | ng/mg | 1.8 - 4.5    | 0.2 - 0.7      |
| Estriol (E3)                      | Above luteal range       | 18.3   | ng/mg | 5 - 18       | 0.6 - 4.0      |
| 2-OH-E1                           | Within luteal range      | 8.30   | ng/mg | 5.1 - 13.1   | 0.3 - 2.0      |
| 4-OH-E1                           | Within luteal range      | 1.03   | ng/mg | 0 - 1.8      | 0 - 0.3        |
| 16-OH-E1                          | Low end of luteal range  | 1.03   | ng/mg | 0.7 - 2.6    | 0.2 - 0.6      |
| 2-Methoxy-E1                      | Within luteal range      | 5.62   | ng/mg | 2.5 - 6.5    | 0.3 - 1.4      |
| 2-OH-E2                           | High end of luteal range | 2.65   | ng/mg | 0 - 3.1      | 0 - 0.52       |
| 4-OH-E2                           | Above luteal range       | 0.53   | ng/mg | 0 - 0.52     | 0 - 0.12       |
| Total Estrogen                    | Above range              | 76.1   | ng/mg | 35 - 70      | 3.5 - 15       |
| Metabolite Ratios (Urine)         |                          |        |       |              |                |
| 2-OH / 16-OH-E1 Balance           | Within range             | 8.06   | ratio | 2.69 - 11.83 |                |
| 2-OH / 4-OH-E1 Balance            | Within range             | 8.06   | ratio | 5.4 - 12.62  |                |
| 2-Methoxy / 2-OH Balance          | Above range              | 0.68   | ratio | 0.39 - 0.67  |                |
| Androgens and Metabolites (Urine) |                          |        |       | Range        |                |
| DHEA-S                            | Within range             | 272.7  | ng/mg | 20 - 750     |                |
| Androsterone                      | Within range             | 460.1  | ng/mg | 200 - 1650   |                |
| Etiocholanolone                   | Within range             | 645.2  | ng/mg | 200 - 1000   |                |
| Testosterone                      | Within range             | 3.25   | ng/mg | 2.3 - 14     |                |
| 5a-DHT                            | Within range             | 2.7    | ng/mg | 0 - 6.6      |                |
| 5a-Androstanediol                 | Within range             | 10.3   | ng/mg | 6 - 30       |                |
| 5b-Androstanediol                 | Within range             | 46.6   | ng/mg | 12 - 75      |                |
| Epi-Testosterone                  | Below range              | 1.9    | 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.

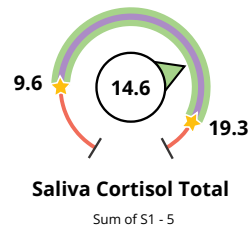
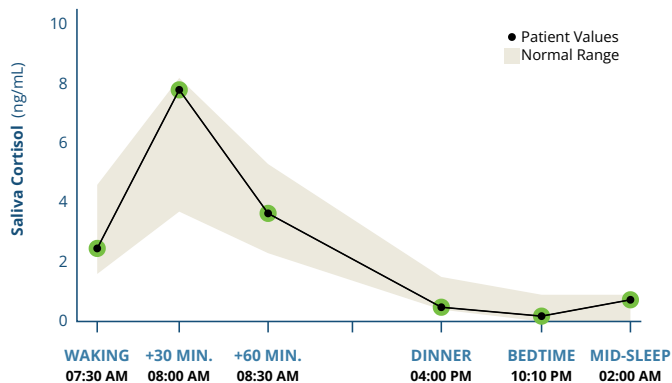
| ADDITIONAL NORMAL RANGES | FOLLICULAR | OVULATORY  | ON ORAL PG  |
|--------------------------|------------|------------|-------------|
| b-Pregnanediol           | 100 - 300  | 100 - 300  | 2000 - 9000 |
| a-Pregnanediol           | 25 - 100   | 25 - 100   | 580 - 3000  |
| Estrone (E1)          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



Saliva Free Cortisone Pattern



Saliva Free Cortisol Pattern



Cortisol and Cortisone interconvert (11b-HSD)



Accession # 010411

Collection Times:

2025-08-11 02:00AM (S0)  
2025-08-10 07:30AM (S1)  
2025-08-10 08:00AM (S2)  
2025-08-10 08:30AM (S3)  
2025-08-10 04:00PM (S4)  
2025-08-10 10:10PM (S5)  
2025-08-10 07:30AM (U1)  
2025-08-10 10:05AM (U2)  
2025-08-10 04:10PM (U3)  
2025-08-10 10:00PM (U4)

Ordering Provider:

Test Provider MD

Female Sample Report

DOB: 1990-01-01

Age: 35

Sex: Female

Last Menstrual Period:

2025-07-14

Adrenal Hormones & Metabolites

| TEST                                    |                   | RESULT | UNITS | NORMAL RANGE |
|-----------------------------------------|-------------------|--------|-------|--------------|
| Free Cortisol and Cortisone (Saliva)    |                   |        |       |              |
| Cortisol (S0) - Mid-Sleep               | Within range      | 0.73   | ng/mL | 0 - 0.9      |
| Cortisol (S1) - Waking                  | Within range      | 2.46   | ng/mL | 1.6 - 4.6    |
| Cortisol (S2) - +30 Min.                | High end of range | 7.80   | ng/mL | 3.7 - 8.2    |
| Cortisol (S3) - +60 Min.                | Within range      | 3.64   | ng/mL | 2.3 - 5.3    |
| Cortisol (S4) - Dinner                  | Low end of range  | 0.48   | ng/mL | 0.4 - 1.5    |
| Cortisol (S5) - Bedtime                 | Within range      | 0.18   | ng/mL | 0 - 0.9      |
| Cortisone (S0) - Mid-Sleep              | Within range      | 3.47   | ng/mL | 0 - 4.8      |
| Cortisone (S1) - Waking                 | Below range       | 6.75   | ng/mL | 6.8 - 14.5   |
| Cortisone (S2) - +30 Min.               | Low end of range  | 13.03  | ng/mL | 12.4 - 19.4  |
| Cortisone (S3) - +60 Min.               | Within range      | 12.01  | ng/mL | 9.4 - 15.3   |
| Cortisone (S4) - Dinner                 | Within range      | 3.09   | ng/mL | 2 - 7.1      |
| Cortisone (S5) - Bedtime                | Within range      | 1.56   | ng/mL | 0 - 4.8      |
| Saliva Cortisol Total (S1 - 5)          | Within range      | 14.57  | ng/mL | 9.6 - 19.3   |
| Saliva Cortisone Total (S1 - 5)         | Low end of range  | 36.45  | ng/mL | 36 - 55      |
| Creatinine (Urine)                      |                   |        |       |              |
| Creatinine (U1) - Waking                | Within range      | 0.35   | mg/ml | 0.2 - 2      |
| Creatinine (U2) - +2 Hours              | Within range      | 0.63   | mg/ml | 0.2 - 2      |
| Creatinine (U3) - Dinner                | Within range      | 1.17   | mg/ml | 0.2 - 2      |
| Creatinine (U4) - Bedtime               | Within range      | 1.31   | mg/ml | 0.2 - 2      |
| Cortisol Metabolites and DHEA-S (Urine) |                   |        |       |              |
| a-Tetrahydrocortisol (a-THF)            | Below range       | 248.7  | ng/mg | 275 - 1160   |
| b-Tetrahydrocortisol (b-THF)            | Low end of range  | 793.0  | ng/mg | 750 - 1800   |
| b-Tetrahydrocortisone (b-THE)           | Within range      | 2054.5 | ng/mg | 1550 - 3800  |
| Metabolized Cortisol (THF + THE)        | Low end of range  | 3096.0 | ng/mg | 2750 - 6500  |
| DHEA-S                                  | Within range      | 272.7  | ng/mg | 20 - 750     |
| Cortisol Clearance Rate (CCR)           | Low end of range  | 60.7   |       | 49 - 110     |

Ordering Provider:

Test Provider

Female Sample Report

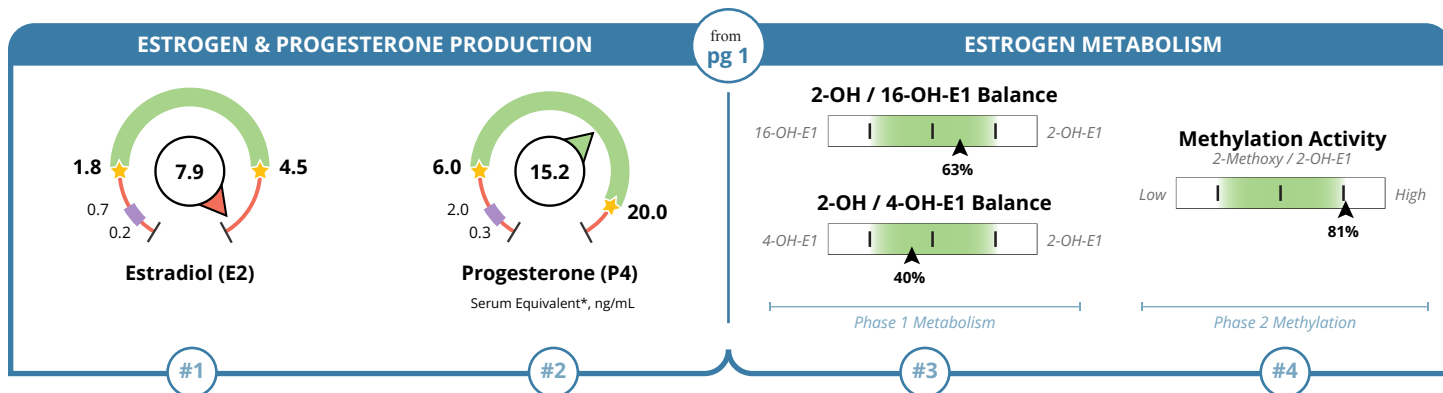
## Organic Acid Tests (OATs)

| TEST                                                         | RESULT            | UNITS | NORMAL RANGE |            |
|--------------------------------------------------------------|-------------------|-------|--------------|------------|
| Nutritional Organic Acids (Urine)                            |                   |       |              |            |
| Vitamin B12 Marker - May be deficient if high                |                   |       |              |            |
| Methylmalonate (MMA)                                         | Within range      | 1.9   | ug/mg        | 0 - 2.5    |
| Vitamin B6 Markers - May be deficient if high                |                   |       |              |            |
| Xanthurenate                                                 | Within range      | 0.52  | ug/mg        | 0.12 - 1.2 |
| Kynurenate                                                   | Within range      | 2.4   | ug/mg        | 0.8 - 4.5  |
| Biotin Marker - May be deficient if high                     |                   |       |              |            |
| b-Hydroxyisovalerate                                         | Above range       | 17.0  | ug/mg        | 0 - 12.5   |
| Glutathione Marker - May be deficient if high                |                   |       |              |            |
| Pyroglutamate                                                | Within range      | 33.5  | ug/mg        | 28 - 58    |
| Gut Marker - Potential gut putrefaction or dysbiosis if high |                   |       |              |            |
| Indican                                                      | High end of range | 100.0 | ug/mg        | 0 - 100    |
| Neuro-Related Markers (Urine)                                |                   |       |              |            |
| Dopamine Metabolite                                          |                   |       |              |            |
| Homovanillate (HVA)                                          | Within range      | 3.9   | ug/mg        | 3 - 11     |
| Norepinephrine/Epinephrine Metabolite                        |                   |       |              |            |
| Vanilmandelate (VMA)                                         | Within range      | 2.9   | ug/mg        | 2.2 - 5.5  |
| Neuroinflammation Marker                                     |                   |       |              |            |
| Quinolate                                                    | Within range      | 6.4   | ug/mg        | 0 - 9.6    |
| Additional Markers (Urine)                                   |                   |       |              |            |
| Melatonin - Waking                                           |                   |       |              |            |
| 6-OH-Melatonin-Sulfate                                       | Within range      | 36.4  | ng/mg        | 10 - 85    |
| Oxidative Stress / DNA Damage                                |                   |       |              |            |
| 8-Hydroxy-2-deoxyguanosine (8-OHdG)                          | Within range      | 2.9   | ng/mg        | 0 - 5.2    |

- The b-hydroxyisovalerate is above the range. This may indicate biotin (vitamin B7) deficiency.

## 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 predominant progesterone metabolite) level.
- The patient reports regular menstrual cycles.
- The patient reports symptoms of both estrogen deficiency and excess. Levels of estrogen (and metabolites) should be carefully reviewed.

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

- Estradiol (the most potent estrogen) is **7.9 ng/mg**, which is above the optimal luteal range. Confirm that the patient's samples were collected in the luteal phase to interpret this result.

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

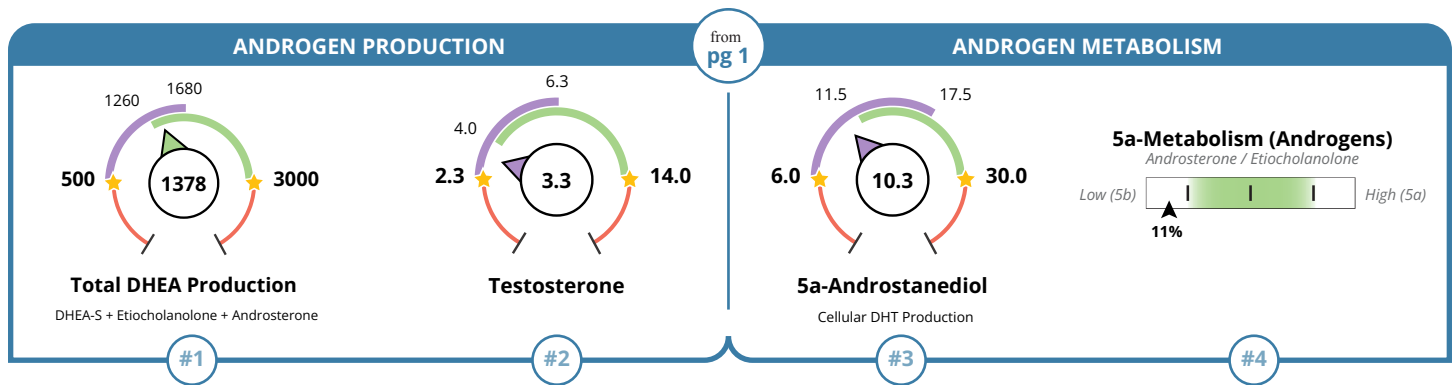
- The progesterone serum equivalent is **15.2 ng/mL**, which is within the optimal luteal range. This indicates that the patient ovulated.

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

- The 2-OH/16-OH-E1 is higher than **63.0%** of the population, which is within the optimal range. This indicates a balance between the beneficial 2-OH-E1 metabolite and the estrogenic 16-OH-E1 metabolite.
- The 2-OH/4-OH-E1 is higher than **40.0%** 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.

- The methylation activity is higher than **81.0%** 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:

- The patient reports symptoms of both androgen deficiency and androgen excess.

### #1. Assess adrenal androgen levels (Total DHEA).

- The total DHEA production is **1,378 ng/mg**, which is within the premenopausal range, but towards the lower end. If paired with low testosterone or low 5a-androstenediol, this may contribute to low androgen symptoms. 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.

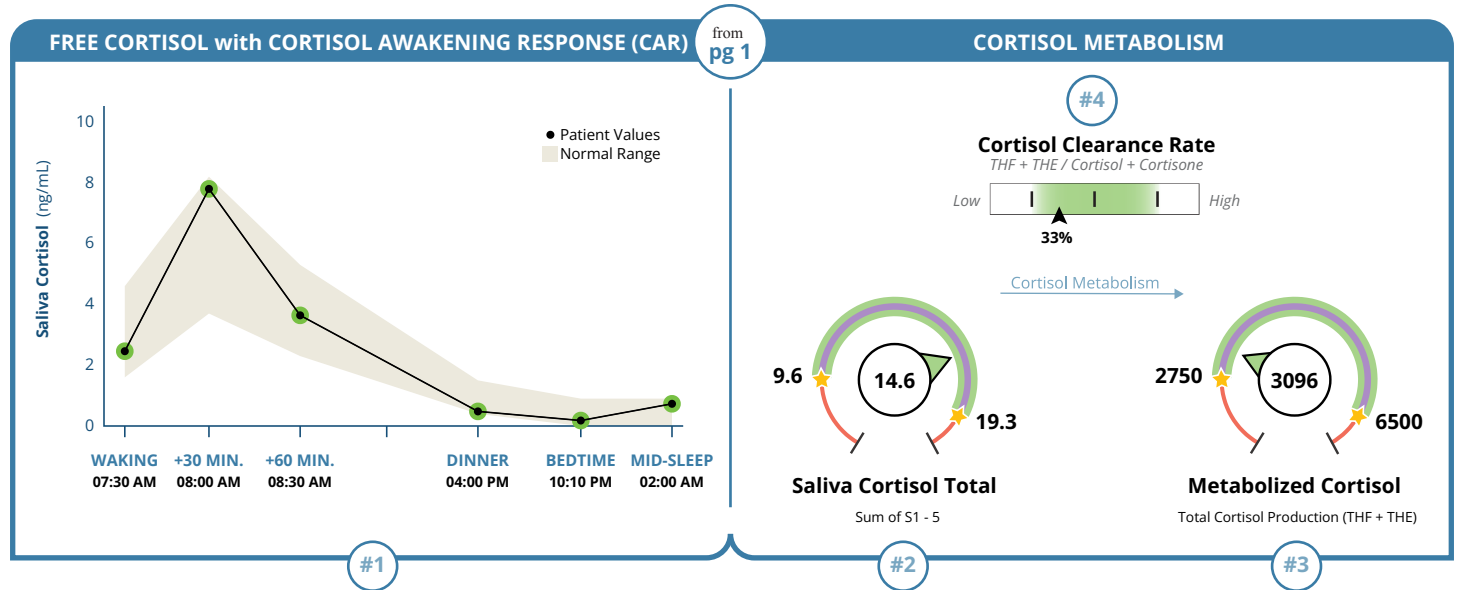
- Testosterone is **3.25 ng/mg**, which is below the optimal premenopausal range, but within the overall range. If paired with low 5a-androstenediol, this may contribute to low androgen symptoms. In most cases, 25-50% of testosterone comes from the ovaries and the rest from adrenal androgen production (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-androstenediol.

- 5a-Androstenediol is **10.3 ng/mg**, which is below the optimal premenopausal range but within the overall range. 5a-Androstenediol 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 only **11.0%** of the population, which is below the range. This indicates a preference for less androgenic pathway. If paired with low androgens, this may contribute to low androgen symptoms.



Cortisol-related Patient or Sample Comments:

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

### #1. Assess the daily free cortisol pattern i including the CAR. i

- All points on the Saliva 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 (sum of S1-S5) of free cortisol in circulation. i

- The Saliva Cortisol Total is **14.6 ng/mL**, which is within the optimal range. This indicates normal overall cortisol levels.

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

- The Metabolized Cortisol, which reflects the total cortisol output for the day, is **3,096 ng/mg**, which is within the optimal range, but towards the low end.

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

- The Cortisol Clearance Rate is higher than **33.0%** 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 76.1 ng/mg, which is above 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. High total estrogens do not always mean the patient has too much estrogen activity, as some estrogen metabolites included in this result are weak or even anti-estrogenic.

#### #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 only **19.0%** of the population, which is below the optimal range. This indicates a preference for 5b compared to 5a metabolites. 5a progesterone metabolites are active on GABA receptors and may impact mood and sleep, but in this case the patient makes less of these metabolites than most. 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.

## About Your Results | Advanced Insights (continued)

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 are low compared to the primary estrogens (E1, E2). This indicates the primary estrogens may be metabolized more slowly through phase 1, which can be associated with a higher risk of estrogen excess conditions. This is most clinically relevant with high estrogens or 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.

- Indican is **100.0 ug/mg**, which is within the optimal range, but towards the higher end. 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 (on the Sex Hormone and Metabolites Table page) alongside other androgens and androgenic symptoms for a more complete interpretation.

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

## About Your Results | Advanced Insights (continued)

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 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.

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

- In this case, free cortisone in the saliva is somewhat lower than the free cortisol. To the degree that this is true, it may indicate the free cortisol levels may not be quite as high in circulation (serum) as the cortisol levels in the saliva imply.

#### #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 provides an estimate of the body's overall cortisol-to-cortisone balance. As these metabolites are processed through the liver, the body may shift toward cortisol (THF) or cortisone (THE) depending on physiologic demands and underlying medical conditions. A normal ratio indicates an appropriate balance between THF and THE.

- The Systemic Preference slider is higher than only **9.0%** 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. A low systemic preference may be seen with hyperthyroidism (or too much thyroid medication), lean PMOS, dutasteride use, fatty liver disease, and type 1 diabetes (insulin dependent).

#### #3. Assess for anabolic-catabolic balance.

- The Total DHEA Production is balanced compared to the Total Cortisol Production. This indicates a balanced state for tissue repair and maintenance.

#### #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>

# About Your Results | Advanced Insights (continued)

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 9.24.2026)                                                                                                                      |      |       |      |       |                                   |      |       |      |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|-------|-----------------------------------|------|-------|------|------|
|                                                                                                                                                                  | 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%   | 49   | 110  |
| 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-Androstenediol                                                                                                                                                | 20%  | 80%   | 6    | 30    | Xanthurenate                      | 0    | 90%   | 0.12 | 1.2  |
| 5b-Androstenediol                                                                                                                                                | 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%   | 275  | 1160  | Pyroglutamate                     | 10%  | 90%   | 28   | 58   |
| b-THF                                                                                                                                                            | 20%  | 90%   | 750  | 1800  | 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  |
|                                                                                                                                                                  |      |       |      |       | <b>Calculated Values</b>          |      |       |      |      |
|                                                                                                                                                                  |      |       |      |       | 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   |