dutchtest COMPLETE

PATIENT INFORMATION

Ordering Provider:
Test Provider MD

Male Sample Report
123 A Street
Sometown, CA 90266

DOB: 1976-01-01
Age: 49
Sex: Male

Accession # 01093511

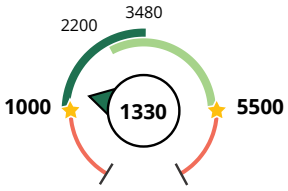
Collection Dates:
2025-06-12 (U3 U4)
2025-06-13 (U1 U2)

Hormone Testing Summary

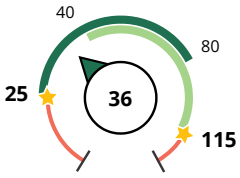
Normal, Age 18 - 40 (Androgens) | Age 41 - 60+ (Androgens) | Out of Range | Edge of Range

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

ANDROGEN PRODUCTION

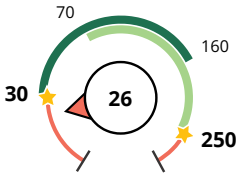


Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone



Testosterone

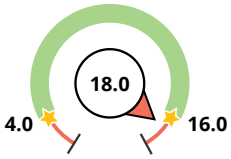
ANDROGEN METABOLISM



5a-Androstanediol
Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone

ESTROGEN PRODUCTION



Estrone (E1)

Estradiol (E2)

ESTROGEN METABOLISM

2-OH / 16-OH-E1 Balance

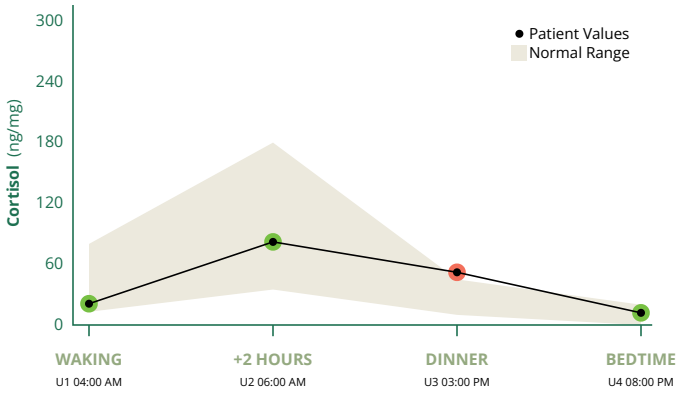
2-OH / 4-OH-E1 Balance

Phase 1 Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1

Phase 2 Methylation

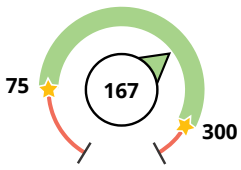
DAILY FREE CORTISOL PATTERN



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

B6 Deficiency | Biotin Deficiency | Neurotransmitters | Melatonin

Androgens

Pregnenolone

Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone
2200 | 3480 | 1000 | 1330 | 5500

DHEA-S
115 | 820 | 30 | 110 | 1500

Androstenedione

Testosterone
40 | 80 | 25 | 36 | 115

5b | 5a

Etiocholanolone
765 | 1090 | 400 | 810 | 1500

Androsterone
1170 | 1870 | 500 | 410 | 3000

aromatase

aromatase

Testosterone

5b | 5a

5b-DHT

5a-DHT
9 | 5 | 7 | 20 | 25

5b-Androstanediol
70 | 160 | 40 | 142 | 250

5a-Androstanediol
70 | 160 | 30 | 26 | 250

Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b) — High (5a)
4%

Estrogens

Estrone (E1)
18.0 | 4.0 | 16.0

17b-HSD

Estradiol (E2)
2.4 | 0.5 | 2.2

CYP3A4

Estriol (E3)
5.6 | 2.0 | 8.0

CYP1A1 (protective)

CYP1B1

CYP3A4

17b-HSD

Phase 1 Estrogen Metabolism

2-OH-E1
2.1 | 0.0 | 5.9

4-OH-E1
0.6 | 0.0 | 0.8

16-OH-E1
1.0 | 0.0 | 1.2

Methylation, Glutathione Detox

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

OMT
ethylation

Phase 2 Estrogen Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1
Low — High
65%

2-Methoxy-E1
1.3 | 0.0 | 2.8

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
4%

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Accession # 01093511

Male Sample Report
123 A Street
Sometown, CA 90266
DOB: 1976-01-01
Age: 49
Sex: Male

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

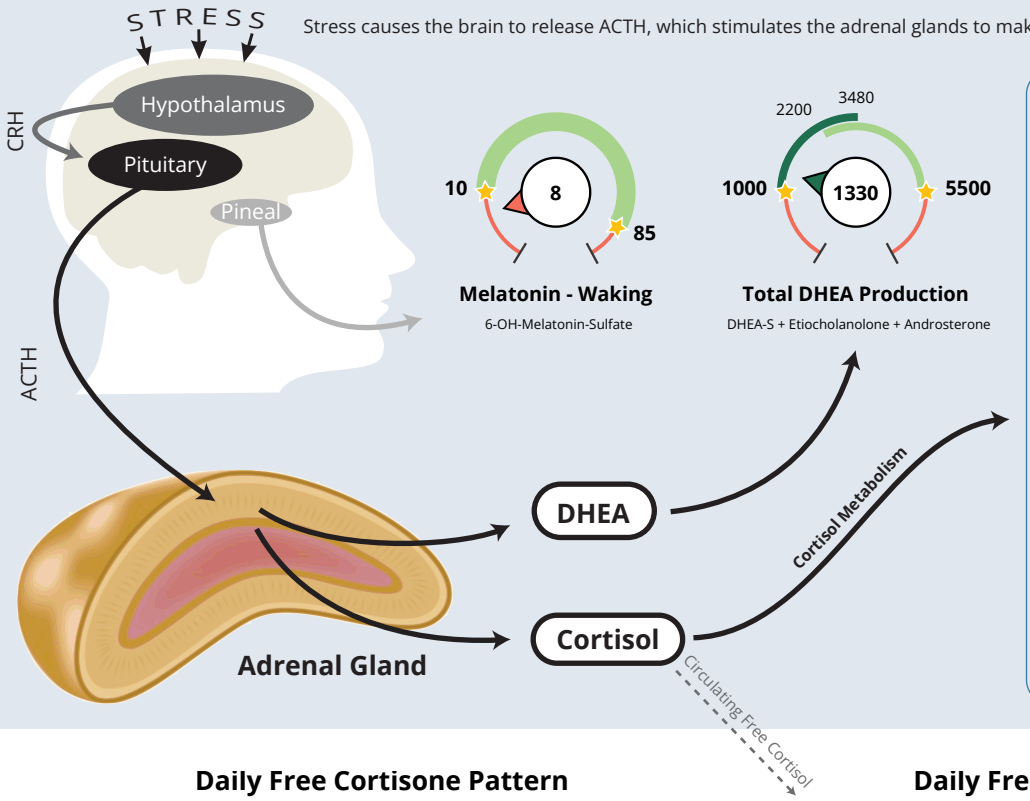
Sex Hormones & Metabolites

TEST		RESULT	UNITS	NORMAL RANGE
Progesterone Metabolites (Urine)				
b-Pregnanediol	Within range	175.7	ng/mg	75 - 400
a-Pregnanediol	Low end of range	24.0	ng/mg	20 - 130
Estrogens and Metabolites (Urine)				
Estrone (E1)	Above range	17.96	ng/mg	4 - 16
Estradiol (E2)	Above range	2.42	ng/mg	0.5 - 2.2
Estriol (E3)	Within range	5.6	ng/mg	2 - 8
2-OH-E1	Within range	2.08	ng/mg	0 - 5.9
4-OH-E1	Within range	0.60	ng/mg	0 - 0.8
16-OH-E1	Within range	1.00	ng/mg	0 - 1.2
2-Methoxy-E1	Within range	1.25	ng/mg	0 - 2.8
2-OH-E2	Within range	0.31	ng/mg	0 - 1.2
4-OH-E2	Within range	0.21	ng/mg	0 - 0.25
Total Estrogen	Within range	31.4	ng/mg	10 - 34
Metabolite Ratios (Urine)				
2-OH / 16-OH-E1 Balance	Below range	2.08	ratio	2.85 - 9.88
2-OH / 4-OH-E1 Balance	Below range	3.47	ratio	6.44 - 12.6
2-Methoxy / 2-OH Balance	Within range	0.60	ratio	0.4 - 0.7
Androgens and Metabolites (Urine)				
DHEA-S	Within range	110.0	ng/mg	30 - 1500
Androsterone	Below range	410.0	ng/mg	500 - 3000
Etiocholanolone	Within range	809.7	ng/mg	400 - 1500
Testosterone	Within range	36.03	ng/mg	25 - 115
5a-DHT	Within range	7.0	ng/mg	5 - 25
5a-Androstanediol	Below range	26.0	ng/mg	30 - 250
5b-Androstanediol	Within range	142.0	ng/mg	40 - 250
Epi-Testosterone	Within range	41.2	ng/mg	25 - 115

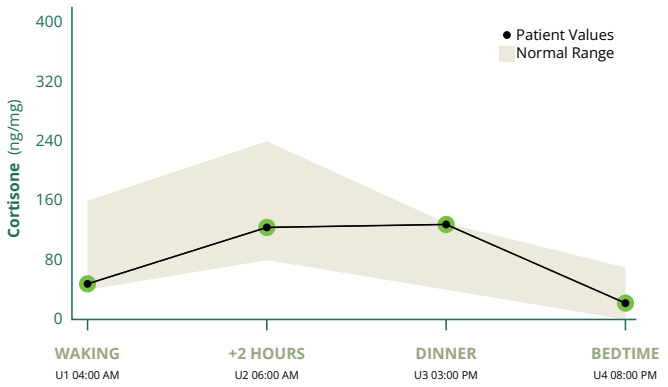
"Normal range" shown above refers to the overall range across all ranges, which lands between the stars on the dials. Age-dependent ranges are now included on the DUTCH dials on page 2.

EXPANDED CORTISOL & ADRENAL HORMONES

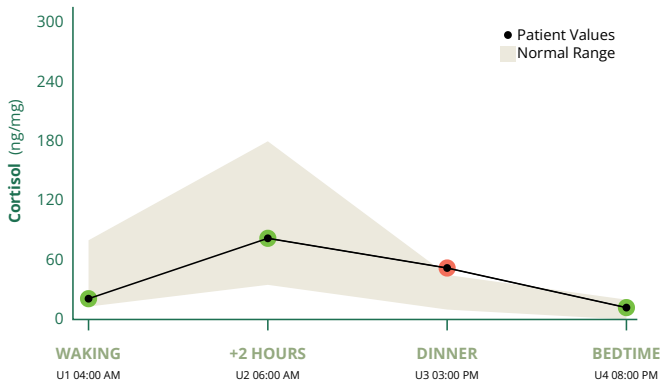
Normal, Age 18 - 40 (Androgens) | Age 41 - 60+ (Androgens) | Out of Range | Edge of Range

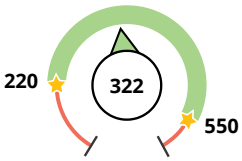


Daily Free Cortisone Pattern



Daily Free Cortisol Pattern

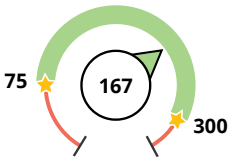




24 Hour Free Cortisone

Sum of all Values

Cortisol and Cortisone interconvert (11b-HSD)



24 Hour Free Cortisol

Sum of all Values

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Male Sample Report
123 A Street
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DOB: 1976-01-01
Age: 49
Sex: Male

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	21.0	ng/mg	13 - 80
Cortisol (U2) - +2 Hours	Within range	82.0	ng/mg	35 - 180
Cortisol (U3) - Dinner	Above range	52.0	ng/mg	10 - 45
Cortisol (U4) - Bedtime	Within range	12.0	ng/mg	0 - 20
Cortisone (U1) - Waking	Low end of range	48.0	ng/mg	40 - 160
Cortisone (U2) - +2 Hours	Within range	124.0	ng/mg	80 - 240
Cortisone (U3) - Dinner	High end of range	128.0	ng/mg	40 - 130
Cortisone (U4) - Bedtime	Within range	22.0	ng/mg	0 - 70
24 Hour Free Cortisol (Sum of all Values)	Within range	167.0	ng/mg	75 - 300
24 Hour Free Cortisone (Sum of all Values)	Within range	322.0	ng/mg	220 - 550
Creatinine (Urine)				
Creatinine (U1) - Waking	Within range	0.50	mg/ml	0.3 - 3
Creatinine (U2) - +2 Hours	Within range	0.72	mg/ml	0.3 - 3
Creatinine (U3) - Dinner	Within range	0.48	mg/ml	0.3 - 3
Creatinine (U4) - Bedtime	Within range	0.34	mg/ml	0.3 - 3
Cortisol Metabolites and DHEA-S (Urine)				
a-Tetrahydrocortisol (a-THF)	Below range	140.0	ng/mg	175 - 700
b-Tetrahydrocortisol (b-THF)	Low end of range	1900.0	ng/mg	1750 - 4000
b-Tetrahydrocortisone (b-THE)	Below range	1950.0	ng/mg	2350 - 5800
Metabolized Cortisol (THF + THE)	Below range	3990.0	ng/mg	4550 - 10000
DHEA-S	Low end of range	110.0	ng/mg	30 - 1500
Cortisol Clearance Rate (CCR)	Below range	8.2		8.5 - 17.5

Organic Acid Tests (OATs)

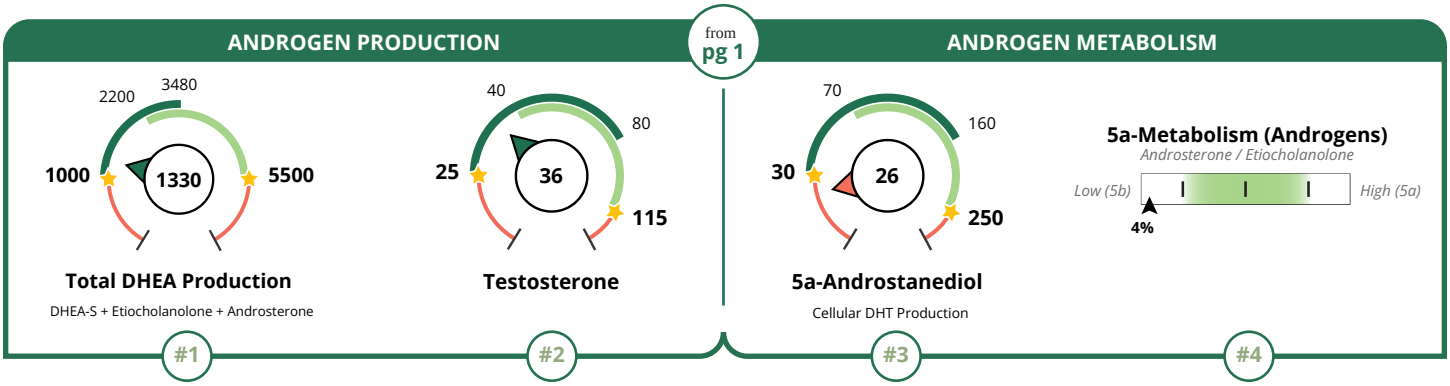
TEST		RESULT	UNITS	NORMAL RANGE
Nutritional Organic Acids (Urine)				
Vitamin B12 Marker - May be deficient if high				
Methylmalonate (MMA)	Within range	2.9	ug/mg	0 - 3.5
Vitamin B6 Markers - May be deficient if high				
Xanthurenate	Above range	2.20	ug/mg	0.2 - 1.9
Kynurenate	High end of range	6.4	ug/mg	1 - 6.6
Biotin Marker - May be deficient if high				
b-Hydroxyisovalerate	Above range	23.0	ug/mg	0 - 18
Glutathione Marker - May be deficient if high				
Pyroglutamate	Within range	62.0	ug/mg	38 - 83
Gut Marker - Potential gut putrefaction or dysbiosis if high				
Indican	Within range	90.4	ug/mg	0 - 131
Neuro-Related Markers (Urine)				
Dopamine Metabolite				
Homovanillate (HVA)	Low end of range	4.4	ug/mg	4 - 16
Norepinephrine/Epinephrine Metabolite				
Vanilmandelate (VMA)	High end of range	7.3	ug/mg	2.5 - 7.5
Neuroinflammation Marker				
Quinolinate	Within range	9.1	ug/mg	0 - 12.5
Additional Markers (Urine)				
Melatonin - Waking				
6-OH-Melatonin-Sulfate	Below range	7.8	ng/mg	10 - 85
Oxidative Stress / DNA Damage				
8-Hydroxy-2-deoxyguanosine (8-OHdG)	Within range	3.7	ng/mg	0 - 8.8

Organic Acids Comments:

- The xanthurenate is above the range. This may indicate a vitamin B6 deficiency. B6 is essential for phase 2 methylation (estrogen detoxification), neurotransmitter synthesis, and other key metabolic processes. Tryptophan taken within 72 hours before testing can also raise kynurenate without indicating a true B6 deficiency.
- The b-hydroxyisovalerate is above the range. This may indicate biotin (vitamin B7) deficiency.
- The HVA, a metabolite of dopamine, is within the normal range, but towards the low end. This may be seen with low dopamine or with slow methylation. Review dopamine-related symptoms before initiating treatment.
- The VMA, a metabolite of epinephrine/norepinephrine, is within the normal range, but towards the high end. This may be seen with high adrenal output or stress. Reviewing cortisol issues may help determine the root cause.
- 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 | Androgens

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



Androgen-related Patient or Sample Comments:

- The patient reports low androgen symptoms.

#1. Assess adrenal androgen levels (Total DHEA)

- The total DHEA production is **1,330 ng/mL**, which is within the range for men who are 41 and older, but towards the lower end of the overall range. If paired with low testosterone or low 5a-androstanediol, this may contribute to a low androgen picture.

#2. Assess testosterone levels

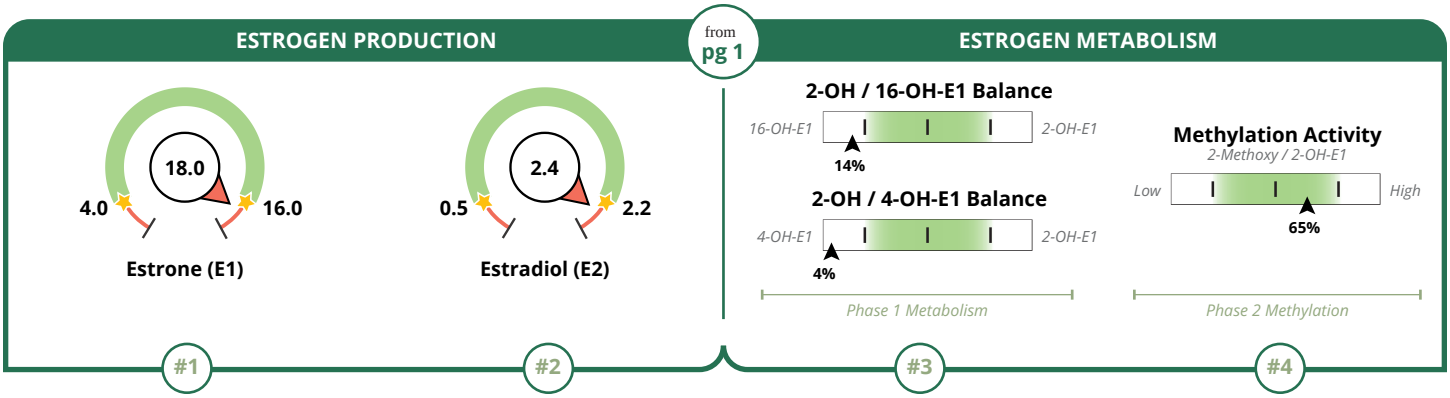
- Testosterone is **36.0 ng/mL**, which is within the optimal range for men who are 41 and older, but on the lower end. If paired with low 5a-androstanediol, this may contribute to low androgen symptoms.

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

- 5a-Androstanediol is **26.0 ng/mL**, which is below the range for men of any age. 5a-Androstanediol 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

- 5a-Metabolism of androgens is **4.00%**, 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.



Estrogen-related Patient or Sample Comments:

- The patient reports symptoms of estrogen excess.

#1. Assess estrogen levels

- Estradiol (the most potent estrogen) is **2.42ng/mg**, which is above the optimal range.

#2. Assess the conversion of testosterone to estrogen (via aromatase)

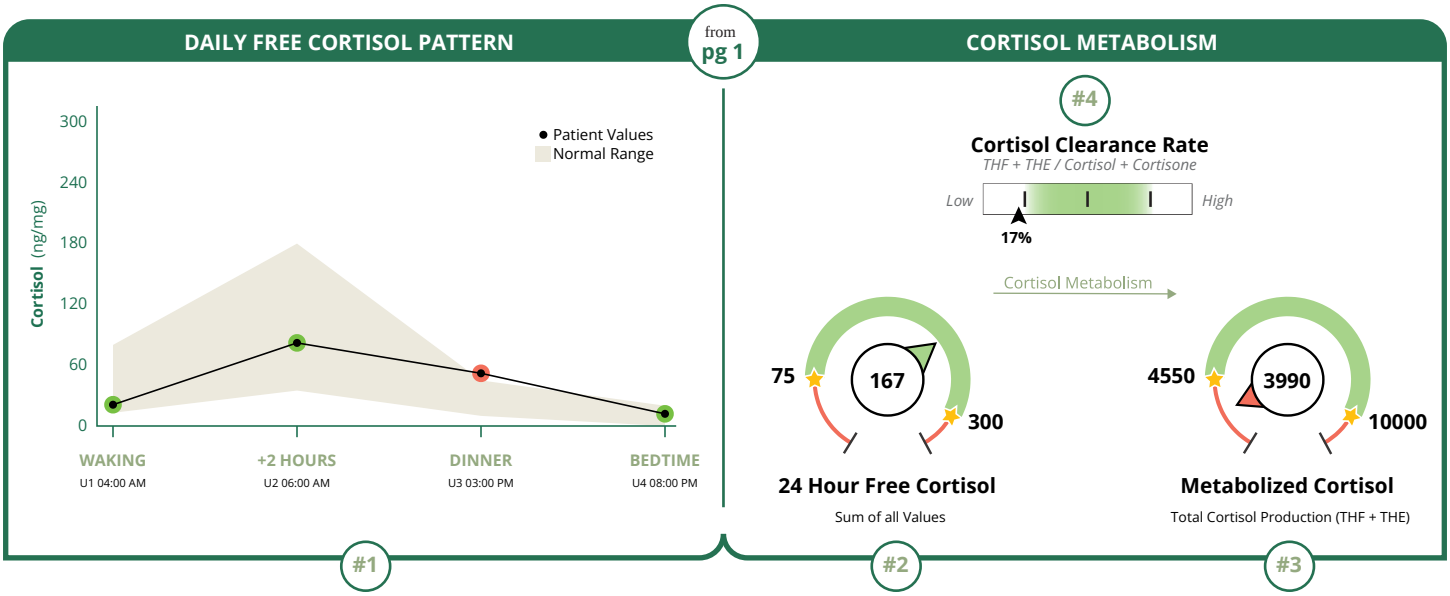
- In males, E2 levels come from circulating testosterone via the aromatase enzyme. This enzyme is upregulated in fat tissue. Testosterone replacement therapy may also contribute to E2 levels.
- Estradiol is above the optimal range relative to testosterone, which indicates that aromatase activity may be upregulated.

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

- The 2-OH/16-OH-E1 is **14.0%**, which is below the optimal range. This indicates a preference for the less desirable 16-OH-E1 metabolite compared to the beneficial 2-OH-E1 metabolite. The 16-OH preference may be associated with estrogenic activity.
- The 2-OH/4-OH-E1 is **4.00%**, which is below the optimal range. This indicates a preference for the less desirable 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 **65.0%**, which is within the optimal range. This indicates optimal estrogen methylation, which is beneficial for efficient estrogen detoxification.



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 (the sum of the 4 points on the Daily Free Cortisol Pattern) is **167ng/mg**, which is within the optimal range.

#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 **3,990ng/mg**, which is below the optimal range.

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

- The Cortisol Clearance Rate is **17.0%**, 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.

About Your Results | Advanced Insights

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.

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 on the DUTCH Test.

  A specific enzyme called UGT2B17, is primarily responsible for the process (glucuronidation) of how testosterone, 5a-DHT, and 5b-Androstanediol are excreted in the urine. Some people have a genetic variation affecting this enzyme which impacts how the body gets rid of those metabolites in urine. This can mean urine tests might show low testosterone levels when actual testosterone levels in the body are normal.

  This variation 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 if low testosterone, 5a-DHT, or 5b-androstanediol results are noted on a urinary test. It does not affect epi-testosterone, 5a-androstanediol, or other androgens, as those are processed (glucuronidated) by different enzymes.

#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 sleep and oxidative stress. Check the OATs page for imbalances in glutathione, melatonin, and oxidative stress markers, which may help identify contributing factors affecting androgens.

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 progesterone production

- In males, progesterone metabolites measured in urine are primarily of adrenal origin. B-Pregnanediol is the best marker of total progesterone. High b-pregnanediol may be associated with increased stress or inflammation. Low b-pregnanediol may accompany reduced adrenal cortisol output, although the clinical significance of low progesterone in men is not well understood.

- 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. Check the OATs page for imbalances in glutathione, B12, B6, gut dybiosis, and oxidative stress markers, which may help identify contributing factors affecting estrogens.

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

ADRENAL

#1. Assess if cortisone (inactive) adds more insight to the free cortisol assessment

- Cortisol is the 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 the 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 levels may imply. 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 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 is influenced by systemic cortisol needs. 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.

  A rightward shift (toward cortisol) paired with elevated free cortisol, may contribute to elevated tissue cortisol. If paired with low free cortisol, it may be helping preserve active cortisol in the systemic tissues.

  A leftward shift (toward cortisone) paired with elevated free cortisol may be protective, helping reduce tissue exposure. If paired with low free cortisol it may worsen low cortisol symptoms by inactivating available cortisol.

#3. Assess for anabolic-catabolic balance

- Androgens support tissue growth and repair, while cortisol promotes tissue breakdown. When androgens are significantly higher than cortisol, it may suggest an anabolic state (favoring tissue building and repair). When androgens are 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. Check the OATs page for imbalances in B12, B6, melatonin, and neuroinflammation markers, which may help identify contributing factors affecting cortisol.

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:

Male Reference Ranges (Updated 05.20.2025)

	Low%	High%	Low	High		Low%	High%	Low	High
b-Pregnanediol	10%	90%	75	400	Cortisol A (waking)	20%	90%	13	80
a-Pregnanediol	10%	90%	20	130	Cortisol B (morning)	20%	90%	35	180
Estrone (E1)	10%	90%	4	16	Cortisol C (~5pm)	20%	90%	10	45
Estradiol (E2)	10%	90%	0.5	2.2	Cortisol D (bed)	0	90%	0	20
Estriol (E3)	10%	90%	2	8	Cortisone A (waking)	20%	90%	40	160
2-OH-E1	0	90%	0	5.9	Cortisone B (morning)	20%	90%	80	240
4-OH-E1	0	90%	0	0.8	Cortisone C (~5pm)	20%	90%	40	130
16-OH-E1	0	90%	0	1.2	Cortisone D (bed)	0	90%	0	70
2-Methoxy-E1	0	90%	0	2.8	Cortisol Clearance Rate (CCR)	20%	80%	8.5	17.5
2-OH-E2	0	90%	0	1.2	Melatonin (6-OHMS)	20%	90%	10	85
4-OH-E2	0	90%	0	0.25	8-OHdG	0	90%	0	8.8
2-16-ratio	20%	80%	2.85	9.88	Methylmalonate	0	90%	0	3.5
2-4-ratio	20%	80%	6.44	12.6	Xanthurenate	0	90%	0.2	1.9
2Me-2OH-ratio	20%	80%	0.4	0.7	Kynurenate	0	90%	1	6.6
DHEA-S	20%	90%	30	1500	b-Hydroxyisovalerate	0	90%	0	18
Androsterone	20%	80%	500	3000	Pyroglutamate	10%	90%	38	83
Etiocholanolone	20%	80%	400	1500	Indican	0	90%	0	131
Testosterone	20%	90%	25	115	Homovanillate	10%	95%	4	16
5a-DHT	20%	90%	5	25	Vanilmandelate	10%	95%	2.5	7.5
5a-Androstanediol	20%	90%	30	250	Quinolinate	0	90%	0	12.5
5b-Androstanediol	20%	90%	40	250	**Calculated Values**				
Epi-Testosterone	20%	90%	25	115	Total DHEA Production	20%	80%	1000	5500
a-THF	20%	90%	175	700	Total Estrogens	10%	90%	10	34
b-THF	20%	90%	1750	4000	Metabolized Cortisol	20%	90%	4550	10000
b-THE	20%	90%	2350	5800	24hr Free Cortisol	20%	90%	75	300
					24hr Free Cortisone	20%	90%	220	550

% = 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."