Ordering Provider:
Test Provider MD

PATIENT INFORMATION

Female Sample Report
123 A Street
Sometown, SC 90266

DOB: 1976-01-01
Age: 49
Sex: Female
Last Menstrual Period:
2025-05-26

Accession # 01093520

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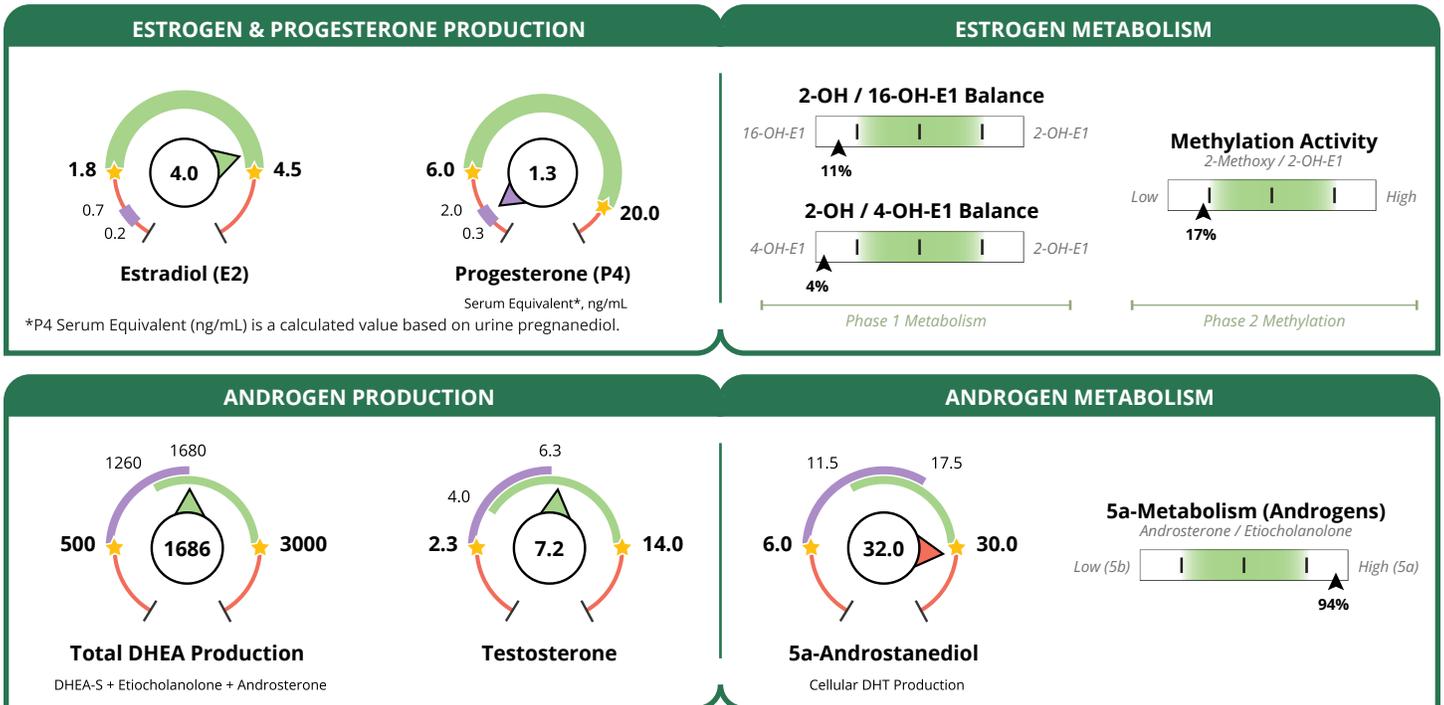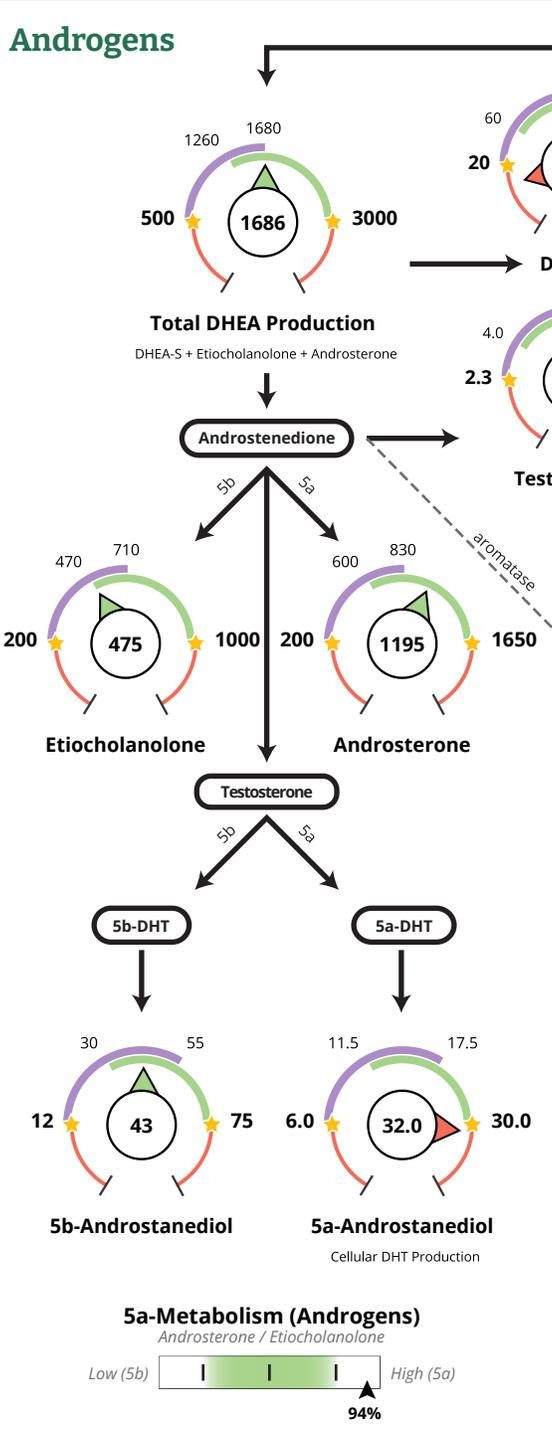**2025-06-13** (U1 U2)

Hormone Testing Summary

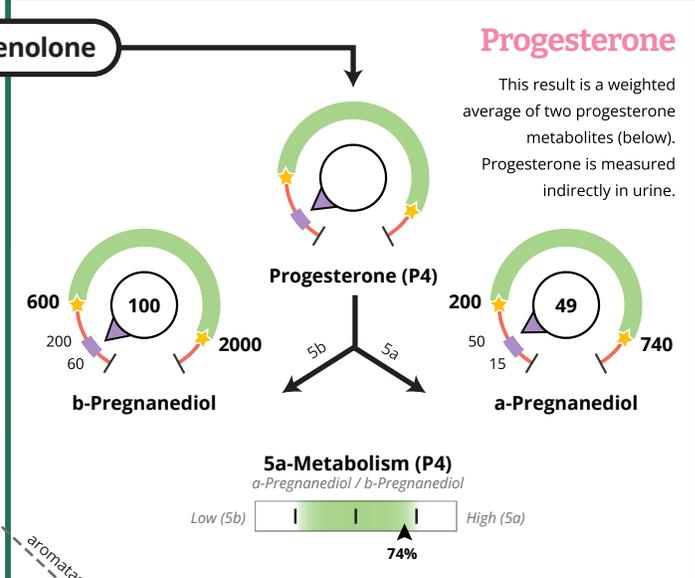● Optimal Luteal Range   ● Postmenopausal Range   ● Out of Range   ⭐ Edge of Range

For an expanded view of results, see page 2 & 3. For interpretive assistance, see *About Your Results* pages.
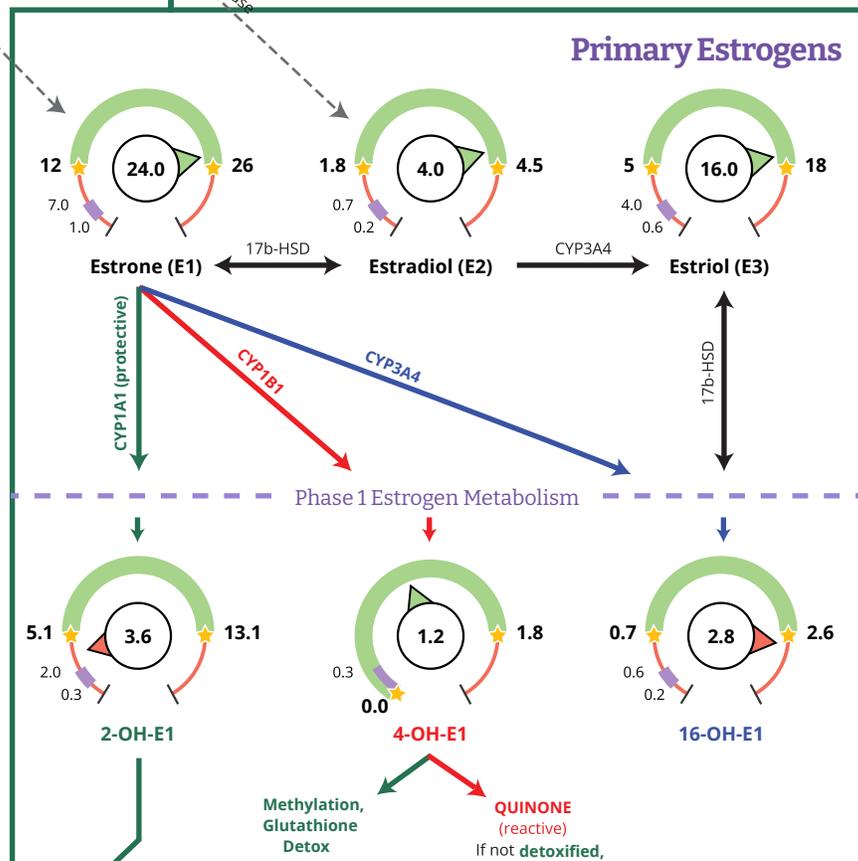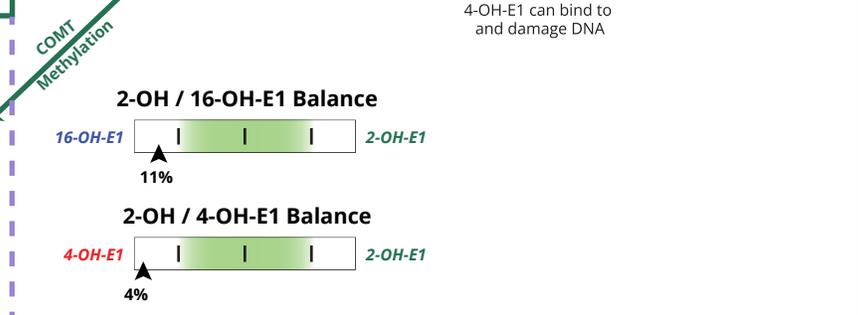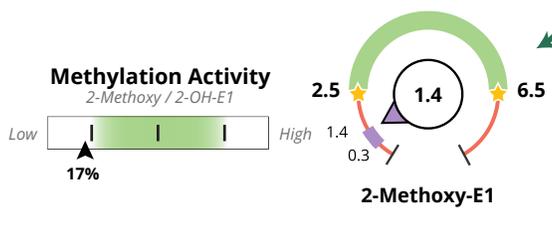
ESTROGEN & PROGESTERONE PRODUCTION

Estradiol (E2)
1.8 / 4.5 · 0.7 · 0.2 — value 4.0

Progesterone (P4)
Serum Equivalent*, ng/mL
6.0 / 20.0 · 2.0 · 0.3 — value 1.3

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

ESTROGEN METABOLISM

2-OH / 16-OH-E1 Balance
16-OH-E1 — 2-OH-E1
11%

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

Phase 1 Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1
Low — High
17%

Phase 2 Methylation

ANDROGEN PRODUCTION

Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone
1260 / 1680 · 500 / 3000 — value 1686

Testosterone
4.0 / 6.3 · 2.3 / 14.0 — value 7.2

ANDROGEN METABOLISM

5a-Androstanediol
Cellular DHT Production
11.5 / 17.5 · 6.0 / 30.0 — value 32.0

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b) — High (5a)
94%

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

Androgens

Pregnenolone

Progesterone

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

Total DHEA Production
1260 | 1680
500 | **1686** | 3000
DHEA-S + Etiocholanolone + Androsterone

DHEA-S
60 | 270
20 | 16 | **750**

Testosterone
6.3
4.0
2.3 | 7.2 | **14.0**

Progesterone (P4)

b-Pregnanediol
600 | 100
200 | **2000**
60

a-Pregnanediol
200 | 49
50 | **740**
15

5a-Metabolism (P4)
a-Pregnanediol / b-Pregnanediol
Low (5b) | *High (5a)*
74%

Androstenedione
5b | 5a

Etiocholanolone
470 | 710
200 | 475 | **1000**

Androsterone
600 | 830
200 | 1195 | **1650**

aromatase

Testosterone
5b | 5a

5b-DHT

5a-DHT

5b-Androstanediol
30 | 55
12 | 43 | **75**

5a-Androstanediol
11.5 | 17.5
6.0 | 32.0 | **30.0**
Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b) | *High (5a)*
94%

Primary Estrogens

Estrone (E1)
12 | 24.0 | 26
7.0
1.0

17b-HSD

Estradiol (E2)
1.8 | 4.0 | 4.5
0.7
0.2

CYP3A4

Estriol (E3)
5 | 16.0 | 18
4.0
0.6

CYP1A1 (protective) — CYP1B1 — CYP3A4 — 17b-HSD

Phase 1 Estrogen Metabolism

2-OH-E1
5.1 | 3.6 | 13.1
2.0
0.3

4-OH-E1
1.2 | 1.8
0.3
0.0

16-OH-E1
0.7 | 2.8 | 2.6
0.6
0.2

Methylation, Glutathione Detox

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

COMT Methylation

Phase 2 Estrogen Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1
Low | *High*
17%

2-Methoxy-E1
2.5 | 1.4 | **6.5**
1.4
0.3

2-OH / 16-OH-E1 Balance
16-OH-E1 | *2-OH-E1*
11%

2-OH / 4-OH-E1 Balance
4-OH-E1 | *2-OH-E1*
4%

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Accession # 01093520

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
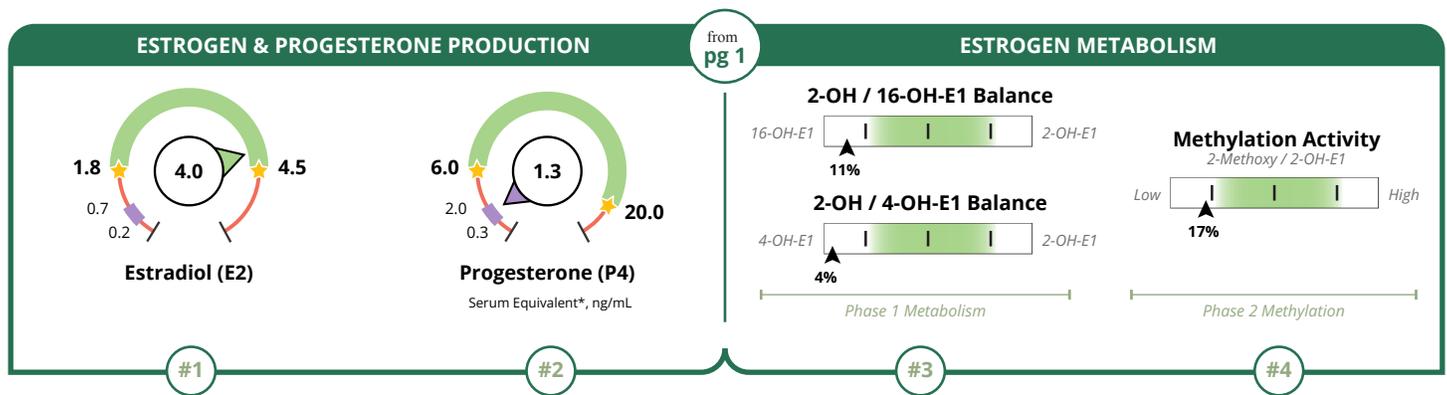
Sex Hormones & Metabolites

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
b-Pregnanediol	100 - 300	100 - 300
a-Pregnanediol	25 - 100	25 - 100
Estrone (E1)	4.0 - 12.0	22 - 68
Estradiol (E2)	1.0 - 2.0	4.0 - 1

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About Your Results | Estrogen & Progesterone

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

ESTROGEN & PROGESTERONE PRODUCTION	from pg 1	ESTROGEN METABOLISM

ESTROGEN & PROGESTERONE PRODUCTION

Estradiol (E2)
- 1.8
- 4.0
- 4.5
- 0.7
- 0.2

Progesterone (P4)
Serum Equivalent*, ng/mL
- 6.0
- 1.3
- 2.0
- 0.3
- 20.0

ESTROGEN METABOLISM

2-OH / 16-OH-E1 Balance
16-OH-E1 — 2-OH-E1
11%

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

Phase 1 Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1
Low — High
17%

Phase 2 Methylation

#1 #2 #3 #4

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.

#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 **17.0%**, which is in the optimal range, but towards the low end. This may indicate slightly reduced estrogen methylation capacity.

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ANDROGEN PRODUCTION

from pg 1

ANDROGEN METABOLISM

Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone

1260 — 1680
500 ⭐ 1686 ⭐ 3000

Testosterone

6.3
4.0
2.3 ⭐ 7.2 ⭐ 14.0

5a-Androstanediol
Cellular DHT Production

11.5 — 17.5
6.0 ⭐ 32.0 ⭐ 30.0

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone

Low (5b) ———— High (5a)
94%

#1   #2   #3   #4

Androgen-related Patient or Sample Comments:

- The patient reports high androgen symptoms.

#1. Assess adrenal androgen levels (Total DHEA)

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

#2. Assess testosterone levels

- Testosterone is **7.2 ng/mg**, which is within the optimal premenopausal range.

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

- 5a-Androstanediol is **32.0 ng/mg**, which is above the range for women 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 **94.0%,** which is above the range. This indicates a preference for the more androgenic pathway.

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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.

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

ANDROGENS

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

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

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

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- 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 inflammation and nutrient status. Check the OATs page for imbalances in B6 and neuroinflammation markers, which may help identify contributing factors affecting androgens.

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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 05.20.2025)								
	Low%	High%	Low	High		Low%	High%	Low	High
b-Pregnanediol	20%	90%	600	2000	Cortisol A (waking)	20%	90%	10	50
a-Pregnanediol	20%	90%	200	740	Cortisol B (morning)	20%	90%	30	130
Estrone (E1)	20%	80%	12	26	Cortisol C (~5pm)	20%	90%	7	30
Estradiol (E2)	20%	80%	1.8	4.5	Cortisol D (bed)	0	90%	0	14
Estriol (E3)	20%	80%	5	18	Cortisone A (waking)	20%	90%	40	120
2-OH-E1	20%	80%	5.1	13.1	Cortisone B (morning)	20%	90%	90	230
4-OH-E1	0	80%	0	1.8	Cortisone C (~5pm)	20%	90%	32	110
16-OH-E1	20%	80%	0.7	2.6	Cortisone D (bed)	0	90%	0	55
2-Methoxy-E1	20%	80%	2.5	6.5	Cortisol Clearance Rate (CCR)	20%	80%	6	12.5
2-OH-E2	0	80%	0	3.1	Melatonin (6-OHMS)	20%	90%	10	85
4-OH-E2	0	80%	0	0.52	8-OHdG	0	90%	0	5.2
2-16-ratio	20%	80%	2.69	11.83	Methylmalonate	0	90%	0	2.5
2-4-ratio	20%	80%	5.4	12.62	Xanthurenate	0	90%	0.12	1.2
2Me-2OH-ratio	20%	80%	0.39	0.67	Kynurenate	0	90%	0.8	4.5
DHEA-S	20%	90%	20	750	b-Hydroxyisovalerate	0	90%	0	12.5
Androsterone	20%	80%	200	1650	Pyroglutamate	10%	90%	28	58
Etiocholanolone	20%	80%	200	1000	Indican	0	90%	0	100
Testosterone	20%	80%	2.3	14	Homovanillate	10%	95%	3	11
5a-DHT	0	80%	0	6.6	Vanilmandelate	10%	95%	2.2	5.5
5a-Androstanediol	20%	80%	6	30	Quinolinate	0	90%	0	9.6
5b-Androstanediol	20%	80%	12	75	**Calculated Values**				
Epi-Testosterone	20%	80%	2.3	14	Total DHEA Production	20%	80%	500	3000
a-THF	20%	90%	75	370	Total Estrogens	20%	80%	35	70
b-THF	20%	90%	1050	2500	Metabolized Cortisol	20%	90%	2750	6500
b-THE	20%	90%	1550	3800	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."

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