PATIENT INFORMATION

Ordering Provider:
Precision Analytical

Gabby, Infertility PCOS
123 A Street
Sometown , CA 90266

DOB: 1994-01-01
Age: 31
Sex: Female
Last Menstrual Period:
2025-08-23

Case # 4
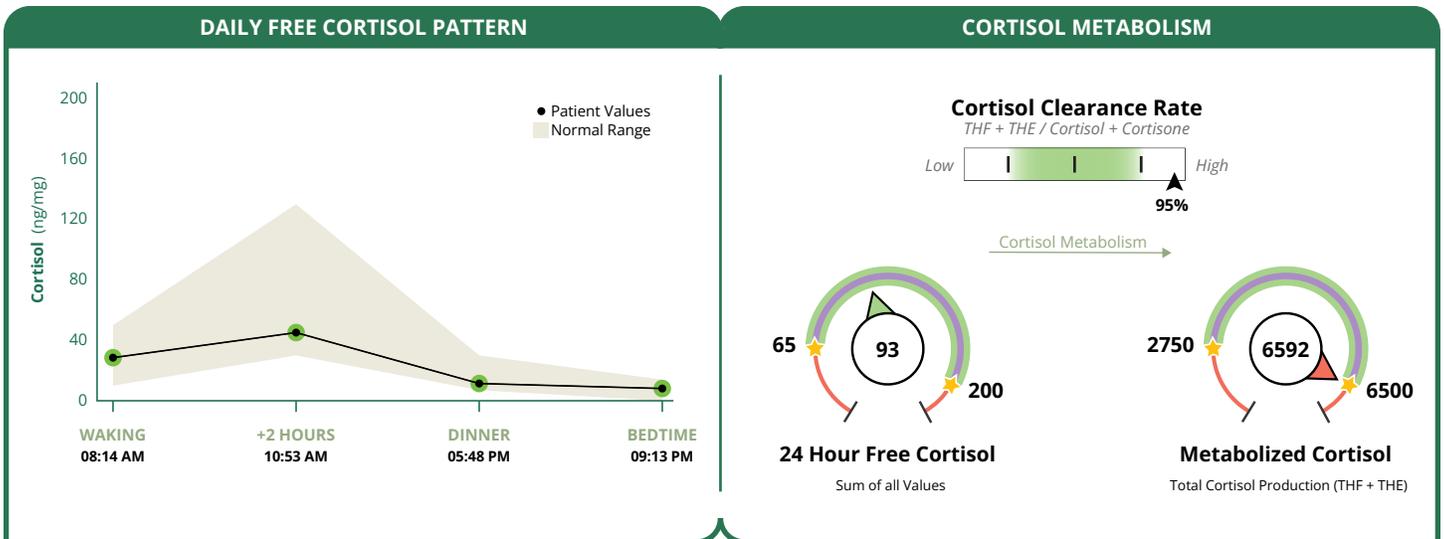
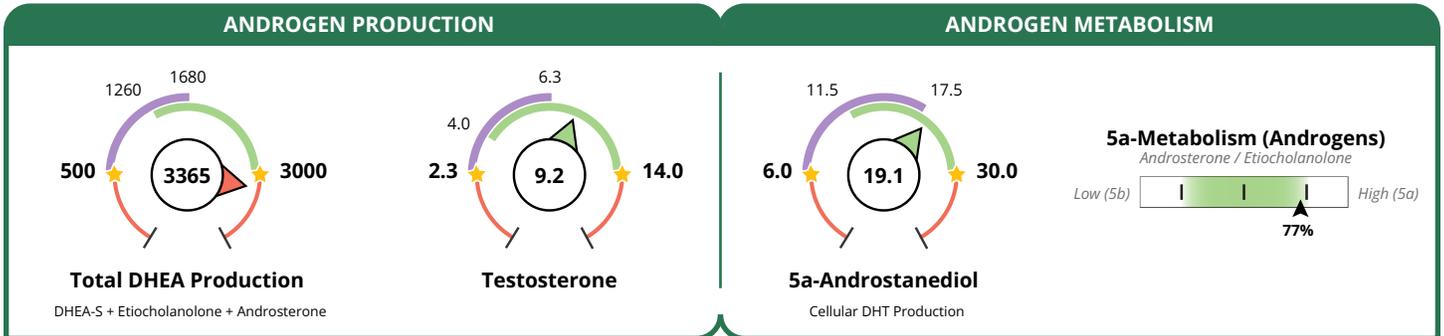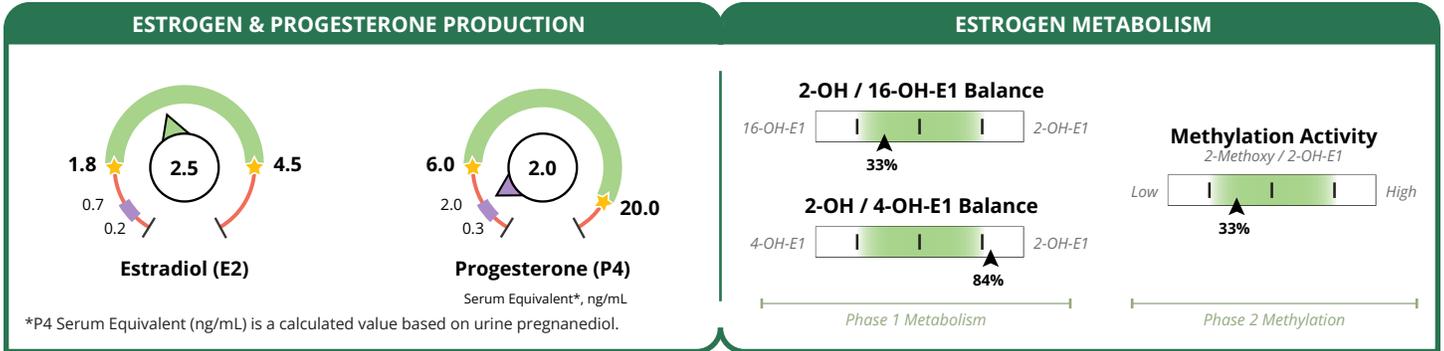**Collection Dates:**
2025-10-12 (U1 U2 U3 U4)

Hormone Testing Summary

● Optimal Luteal Range   ● Postmenopausal Range   ● Out of Range   ★ Edge of Range
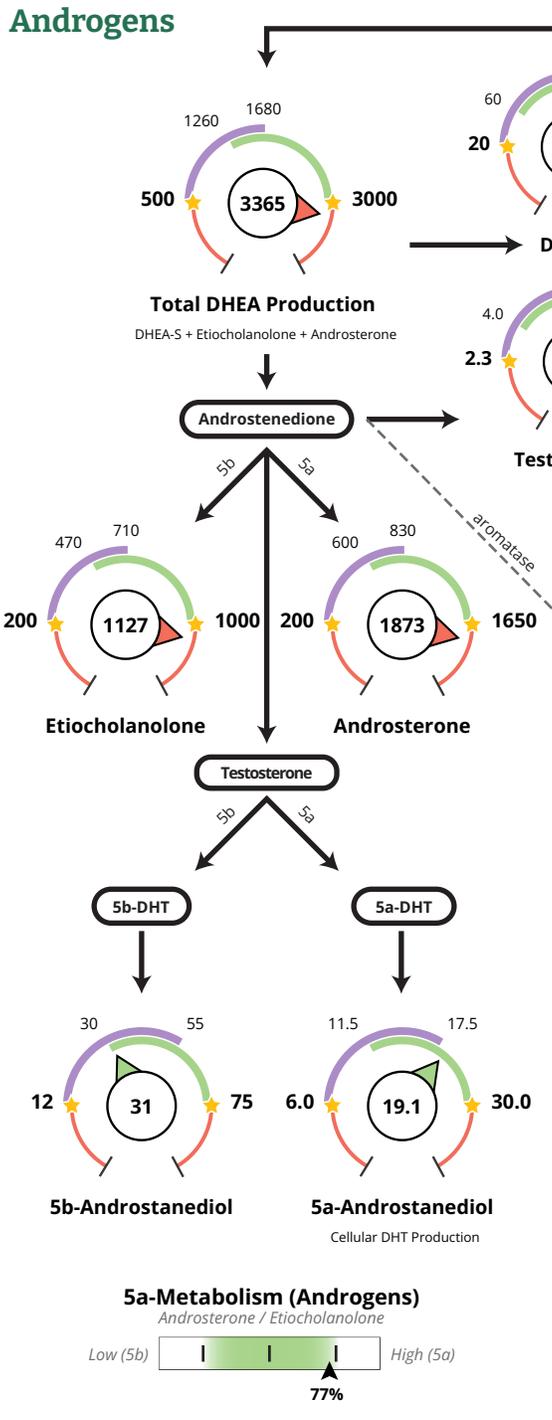
For an expanded view of results, see pages 2 through 6. For interpretive support, see *About Your Results* pages.
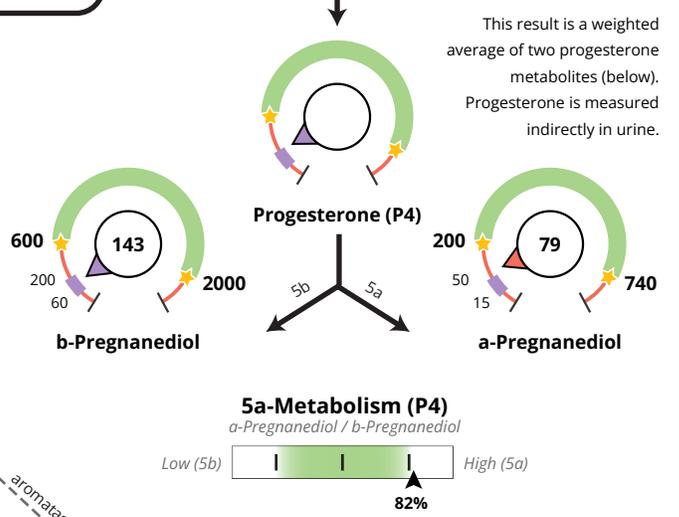
ESTROGEN & PROGESTERONE PRODUCTION

Estradiol (E2)
1.8 — 4.5
0.7 / 0.2
2.5

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

*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
33%

2-OH / 4-OH-E1 Balance
4-OH-E1 ———— 2-OH-E1
84%

Methylation Activity
2-Methoxy / 2-OH-E1
Low ———— High
33%

Phase 1 Metabolism   *Phase 2 Methylation*

ANDROGEN PRODUCTION

Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone
1260 / 1680
500 — 3000
3365

Testosterone
4.0 / 6.3
2.3 — 14.0
9.2

ANDROGEN METABOLISM

5a-Androstanediol
Cellular DHT Production
11.5 / 17.5
6.0 — 30.0
19.1

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b) ———— High (5a)
77%

DAILY FREE CORTISOL PATTERN

- Patient Values
- Normal Range

	WAKING	+2 HOURS	DINNER	BEDTIME
Time	08:14 AM	10:53 AM	05:48 PM	09:13 PM

Cortisol (ng/mg)

CORTISOL METABOLISM

Cortisol Clearance Rate
THF + THE / Cortisol + Cortisone
Low ———— High
95%

Cortisol Metabolism →

24 Hour Free Cortisol
Sum of all Values
65 — 200
93

Metabolized Cortisol
Total Cortisol Production (THF + THE)
2750 — 6500
6592

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

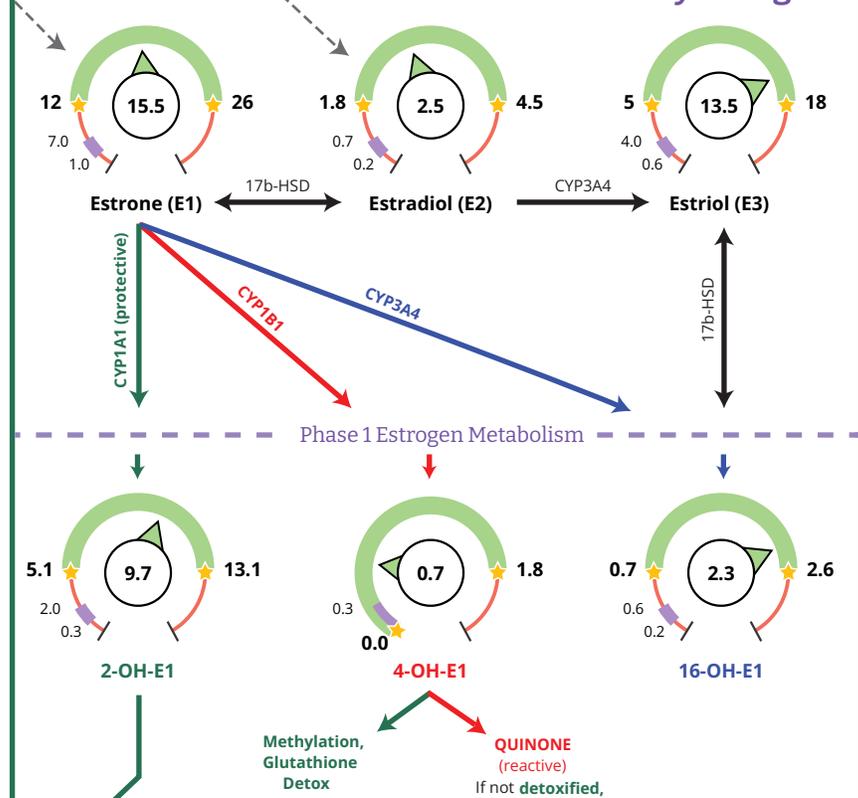● Watch   ● Needs Attention
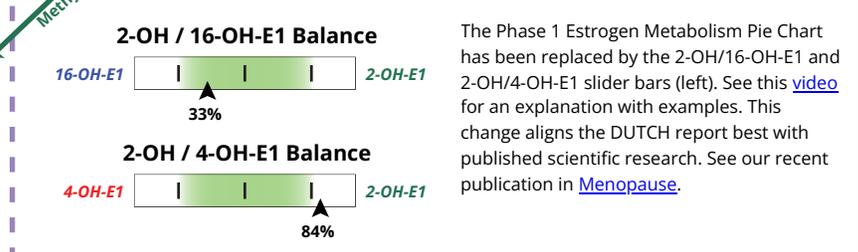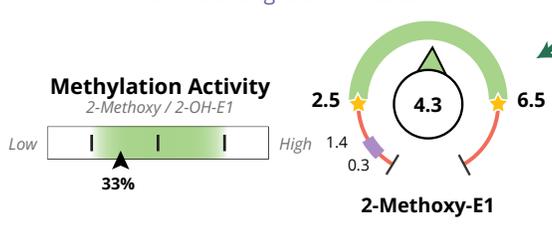
● B6 Deficiency   ● Neuroinflammation

PRECISION ANALYTICAL INC. CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 1 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

● **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 — **3365** — 3000

DHEA-S + Etiocholanolone + Androsterone

DHEA-S
60 — 270
20 — **366** — 750

Testosterone
6.3
4.0
2.3 — **9.2** — 14.0

Androstenedione
5b / 5a

Etiocholanolone
470 — 710
200 — **1127** — 1000

Androsterone
600 — 830
200 — **1873** — 1650

Testosterone
5b / 5a

5b-DHT

5a-DHT

5b-Androstanediol
30 — 55
12 — **31** — 75

5a-Androstanediol
11.5 — 17.5
6.0 — **19.1** — 30.0
Cellular DHT Production

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone

Low (5b) | | | High (5a)
77%

Progesterone (P4)

b-Pregnanediol
600 — **143** — 2000
200
60

5b / 5a

a-Pregnanediol
200 — **79** — 740
50
15

5a-Metabolism (P4)
a-Pregnanediol / b-Pregnanediol

Low (5b) | | | High (5a)
82%

Primary Estrogens

Estrone (E1)
12 — **15.5** — 26
7.0
1.0

17b-HSD

Estradiol (E2)
1.8 — **2.5** — 4.5
0.7
0.2

CYP3A4

Estriol (E3)
5 — **13.5** — 18
4.0
0.6

aromatase

CYP1A1 (protective)

CYP1B1

CYP3A4

17b-HSD

Phase 1 Estrogen Metabolism

2-OH-E1
5.1 — **9.7** — 13.1
2.0
0.3

4-OH-E1
0.7 — 1.8
0.3
0.0

16-OH-E1
0.7 — **2.3** — 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
33%

2-Methoxy-E1
2.5 — **4.3** — 6.5
1.4
0.3

2-OH / 16-OH-E1 Balance

16-OH-E1 | | | 2-OH-E1
33%

2-OH / 4-OH-E1 Balance

4-OH-E1 | | | 2-OH-E1
84%

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.

Case # 4
Gabby, Infertility PCOS
123 A Street
Sometown , CA 90266

DOB: 1994-01-01
Age: 31
Sex: Female
Last Menstrual Period:
2025-08-23

Collection Times:
2025-10-12 08:14AM (U1)
2025-10-12 10:53AM (U2)
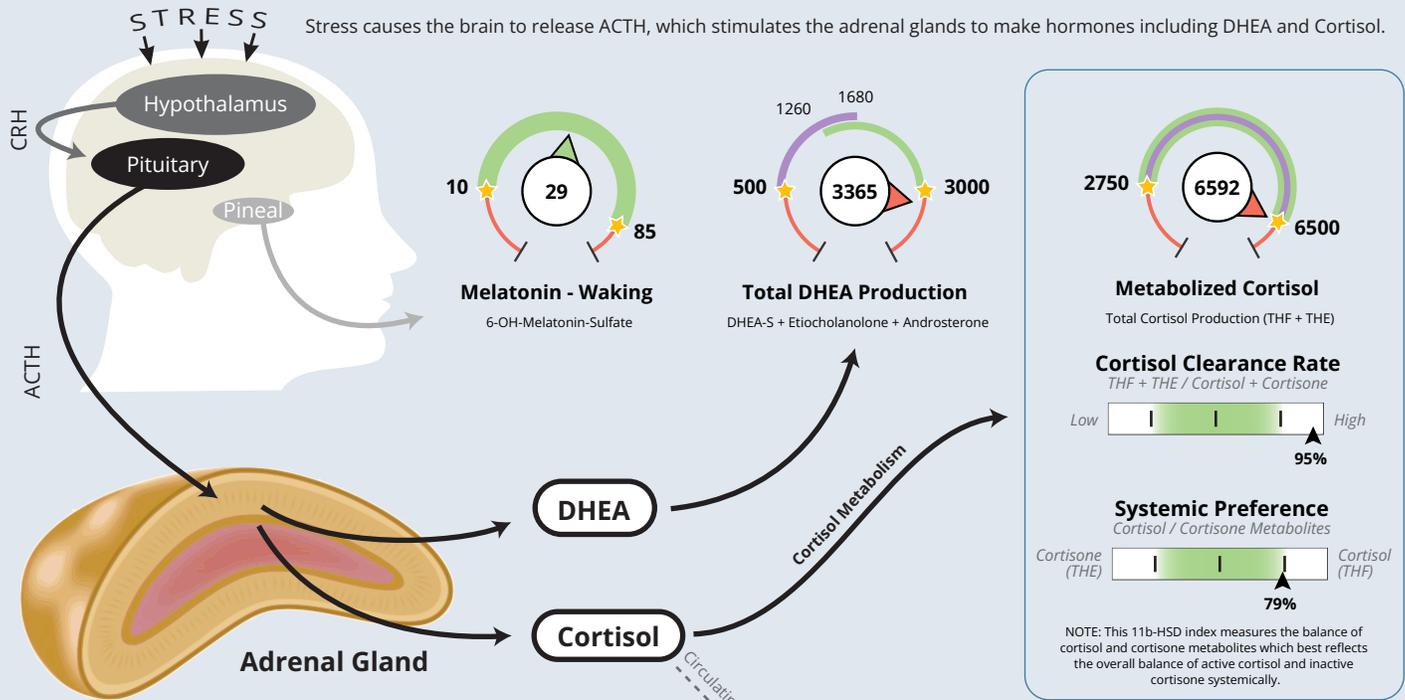2025-10-12 05:48PM (U3)
2025-10-12 09:13PM (U4)

Ordering Provider:

Precision Analytical
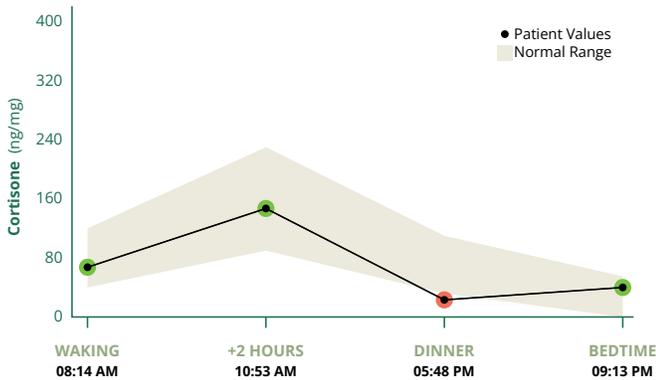
Sex Hormones & Metabolites

TEST		RESULT	UNITS	LUTEAL*	POSTMENOPAUSAL
Progesterone Metabolites (Urine)					
b-Pregnanediol	Below luteal range	143.2	ng/mg	600 - 2000	60 - 200
a-Pregnanediol	Below luteal range	78.5	ng/mg	200 - 740	15 - 50
Estrogens and Metabolites (Urine)					
Estrone (E1)	Within luteal range	15.49	ng/mg	12 - 26	1.0 - 7.0
Estradiol (E2)	Within luteal range	2.53	ng/mg	1.8 - 4.5	0.2 - 0.7
Estriol (E3)	Within luteal range	13.5	ng/mg	5 - 18	0.6 - 4.0
2-OH-E1	Within luteal range	9.70	ng/mg	5.1 - 13.1	0.3 - 2.0
4-OH-E1	Within luteal range	0.71	ng/mg	0 - 1.8	0 - 0.3
16-OH-E1	High end of luteal range	2.28	ng/mg	0.7 - 2.6	0.2 - 0.6
2-Methoxy-E1	Within luteal range	4.28	ng/mg	2.5 - 6.5	0.3 - 1.4
2-OH-E2	Within luteal range	1.01	ng/mg	0 - 3.1	0 - 0.52
4-OH-E2	Within luteal range	0.12	ng/mg	0 - 0.52	0 - 0.12
Total Estrogen	Within range	49.6	ng/mg	35 - 70	3.5 - 15
Metabolite Ratios (Urine)					
2-OH / 16-OH-E1 Balance	Within range	4.25	ratio	2.69 - 11.83	
2-OH / 4-OH-E1 Balance	Above range	13.66	ratio	5.4 - 12.62	
2-Methoxy / 2-OH Balance	Within range	0.44	ratio	0.39 - 0.67	
Androgens and Metabolites (Urine)				Range	
DHEA-S	Within range	365.5	ng/mg	20 - 750	
Androsterone	Above range	1872.9	ng/mg	200 - 1650	
Etiocholanolone	Above range	1126.7	ng/mg	200 - 1000	
Testosterone	Within range	9.21	ng/mg	2.3 - 14	
5a-DHT	Within range	4.6	ng/mg	0 - 6.6	
5a-Androstanediol	Within range	19.1	ng/mg	6 - 30	
5b-Androstanediol	Within range	30.8	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.
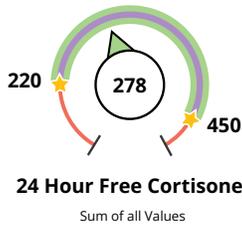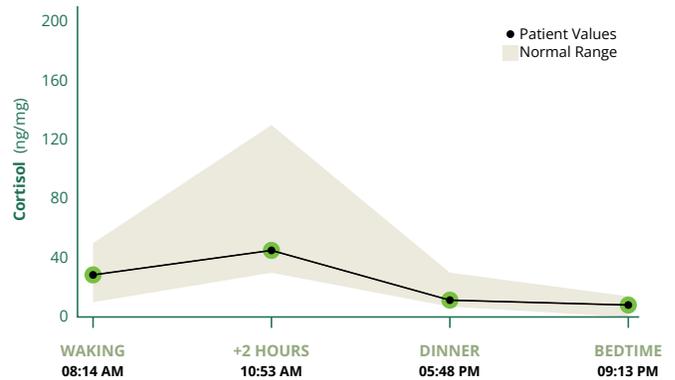
ADDITIONAL NORMAL RANGES	FOLLICULAR	OVULATORY	ON ORAL PG
b-Pregnanediol	100 - 300	100 - 300	2000 - 9000
a-Pregnanediol	25 - 100	25 - 100	580 - 3000
Estrone (E1)	4.0 - 12.0	22 - 68	N/A
Estradiol (E2)	1.0 - 2.0	4.0 - 12.0	N/A

PRECISION
ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 3 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

EXPANDED CORTISOL & ADRENAL HORMONES

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

STRESS

Stress causes the brain to release ACTH, which stimulates the adrenal glands to make hormones including DHEA and Cortisol.

CRH

Hypothalamus

Pituitary

Pineal

ACTH

DHEA

Cortisol

Adrenal Gland

Cortisol Metabolism

Circulating Free Cortisol

Melatonin - Waking
10 — 29 — 85
6-OH-Melatonin-Sulfate

Total DHEA Production
1260 — 1680
500 — 3365 — 3000
DHEA-S + Etiocholanolone + Androsterone

Metabolized Cortisol
2750 — 6592 — 6500
Total Cortisol Production (THF + THE)

Cortisol Clearance Rate
THF + THE / Cortisol + Cortisone
Low | | | High
95%

Systemic Preference
Cortisol / Cortisone Metabolites
Cortisone (THE) | | | Cortisol (THF)
79%

NOTE: This 11b-HSD index measures the balance of cortisol and cortisone metabolites which best reflects the overall balance of active cortisol and inactive cortisone systemically.

Daily Free Cortisone Pattern

Cortisone (ng/mg)

● Patient Values
□ Normal Range

400
320
240
160
80

WAKING 08:14 AM | +2 HOURS 10:53 AM | DINNER 05:48 PM | BEDTIME 09:13 PM

Daily Free Cortisol Pattern

Cortisol (ng/mg)

● Patient Values
□ Normal Range

200
160
120
80
40

WAKING 08:14 AM | +2 HOURS 10:53 AM | DINNER 05:48 PM | BEDTIME 09:13 PM

24 Hour Free Cortisone
220 — 278 — 450
Sum of all Values

Cortisol and Cortisone interconvert (11b-HSD)
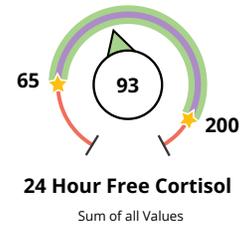
24 Hour Free Cortisol
65 — 93 — 200
Sum of all Values

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 4 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

Case # 4
Gabby, Infertility PCOS
123 A Street
Sometown , CA 90266
DOB: 1994-01-01
Age: 31
Sex: Female
Last Menstrual Period:
2025-08-23

Collection Times:
2025-10-12 08:14AM (U1)
2025-10-12 10:53AM (U2)
2025-10-12 05:48PM (U3)
2025-10-12 09:13PM (U4)

Ordering Provider:

Precision Analytical

Adrenal Hormones & Metabolites

TEST		RESULT	UNITS	NORMAL RANGE
Daily Free Cortisol and Cortisone (Urine)				
Cortisol (U1) - Waking	Within range	28.5	ng/mg	10 - 50
Cortisol (U2) - +2 Hours	Low end of range	45.1	ng/mg	30 - 130
Cortisol (U3) - Dinner	Low end of range	11.4	ng/mg	7 - 30
Cortisol (U4) - Bedtime	Within range	8.1	ng/mg	0 - 14
Cortisone (U1) - Waking	Within range	67.4	ng/mg	40 - 120
Cortisone (U2) - +2 Hours	Within range	147.0	ng/mg	90 - 230
Cortisone (U3) - Dinner	Below range	23.2	ng/mg	32 - 110
Cortisone (U4) - Bedtime	Within range	40.0	ng/mg	0 - 55
24 Hour Free Cortisol (Sum of all Values)	Within range	93.1	ng/mg	65 - 200
24 Hour Free Cortisone (Sum of all Values)	Within range	277.6	ng/mg	220 - 450
Creatinine (Urine)				
Creatinine (U1) - Waking	Within range	1.23	mg/ml	0.2 - 2
Creatinine (U2) - +2 Hours	Within range	0.59	mg/ml	0.2 - 2
Creatinine (U3) - Dinner	Within range	0.76	mg/ml	0.2 - 2
Creatinine (U4) - Bedtime	Within range	0.57	mg/ml	0.2 - 2
Cortisol Metabolites and DHEA-S (Urine)				
a-Tetrahydrocortisol (a-THF)	Above range	612.3	ng/mg	75 - 370
b-Tetrahydrocortisol (b-THF)	Above range	2597.8	ng/mg	1050 - 2500
b-Tetrahydrocortisone (b-THE)	Within range	3382.2	ng/mg	1550 - 3800
Metabolized Cortisol (THF + THE)	Above range	6592.0	ng/mg	2750 - 6500
DHEA-S	Within range	365.5	ng/mg	20 - 750
Cortisol Clearance Rate (CCR)	Above range	17.8		6 - 12.5

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 5 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

PATIENT INFORMATION

Ordering Provider:

Precision Analytical

Gabby, Infertility PCOS
123 A Street
Sometown , CA 90266

DOB: 1994-01-01
Age: 31
Sex: Female
Last Menstrual Period:
2025-08-23

Case # 4

Collection Dates:
2025-10-12 (U1 U2 U3 U4)

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	2.0	ug/mg	0 - 2.5
Vitamin B6 Markers - May be deficient if high				
Xanthurenate	Above range	1.50	ug/mg	0.12 - 1.2
Kynurenate	Above range	4.8	ug/mg	0.8 - 4.5
Biotin Marker - May be deficient if high				
b-Hydroxyisovalerate	Within range	5.6	ug/mg	0 - 12.5
Glutathione Marker - May be deficient if high				
Pyroglutamate	Within range	42.4	ug/mg	28 - 58
Gut Marker - Potential gut putrefaction or dysbiosis if high				
Indican	Within range	67.2	ug/mg	0 - 100
Neuro-Related Markers (Urine)				
Dopamine Metabolite				
Homovanillate (HVA)	Within range	4.3	ug/mg	3 - 11
Norepinephrine/Epinephrine Metabolite				
Vanilmandelate (VMA)	Within range	2.9	ug/mg	2.2 - 5.5
Neuroinflammation Marker				
Quinolinate	Above range	13.6	ug/mg	0 - 9.6
Additional Markers (Urine)				
Melatonin - Waking				
6-OH-Melatonin-Sulfate	Within range	28.9	ng/mg	10 - 85
Oxidative Stress / DNA Damage				
8-Hydroxy-2-deoxyguanosine (8-OHdG)	Within range	2.1	ng/mg	0 - 5.2

- 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 quinolinate is above the normal range. This increase may be in response to high cortisol and inflammation, potentially contributing to mood and sleep dysregulation through neuroinflammation. Tryptophan taken within 72 hours before testing can also raise quinolinate in the urine without raising it in circulation.

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 6 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

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

Estradiol (E2)
1.8 — 2.5 — 4.5
0.7
0.2

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

2-OH / 16-OH-E1 Balance
16-OH-E1 ◄—— 33% ——► 2-OH-E1

2-OH / 4-OH-E1 Balance
4-OH-E1 ◄—— 84% ——► 2-OH-E1

Phase 1 Metabolism

Methylation Activity
2-Methoxy / 2-OH-E1
Low ◄—— 33% ——► High

Phase 2 Methylation

#1   #2   #3   #4
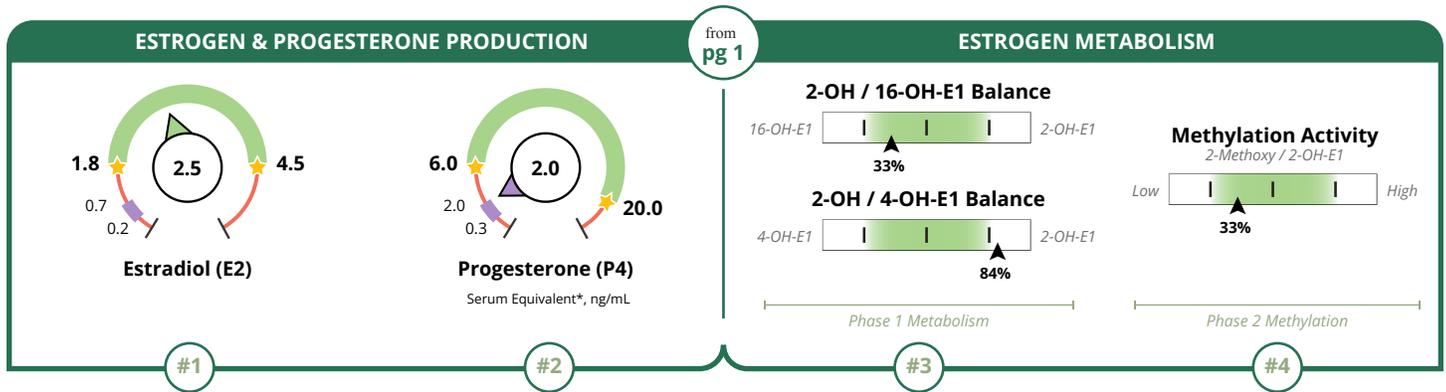
Estrogen-related Patient or Sample Comments:

- 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 irregular menstrual cycles.

- The patient reported symptoms of excess estrogen.

#1. Assess estrogen levels given the patient's reproductive status. More information is available [here].

- Estradiol (the most potent estrogen) is **2.53 ng/mg**, which is within the optimal luteal range.

#2. Assess progesterone levels given the patient's reproductive status. More information is available [here].

- The progesterone serum equivalent is **2.00 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.

#3. Assess 2-OH preference in phase 1 estrogen metabolism. More information is available [here].

- The 2-OH/16-OH-E1 is higher than **33.0%** 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 **84.0%** of the population, which is above the optimal range. This indicates a preference for the beneficial 2-OH-E1 metabolite compared to the potentially genotoxic (DNA damaging) 4-OH-E1 metabolite.

#4. Assess methylation of 2-OH catechol estrogens. More information is available [here].

- The methylation activity is higher than **33.0%** of the population, which is within the optimal range. This indicates optimal estrogen methylation, which is beneficial for efficient estrogen detoxification.

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 7 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

ANDROGEN PRODUCTION	from pg 1	ANDROGEN METABOLISM

Total DHEA Production
DHEA-S + Etiocholanolone + Androsterone
1260 | 1680 | 500 | 3365 | 3000
#1

Testosterone
4.0 | 6.3 | 2.3 | 9.2 | 14.0
#2

5a-Androstanediol
Cellular DHT Production
11.5 | 17.5 | 6.0 | 19.1 | 30.0
#3

5a-Metabolism (Androgens)
Androsterone / Etiocholanolone
Low (5b) | High (5a)
77%
#4

Androgen-related Patient or Sample Comments:

- The patient reported significant symptoms of excess androgen levels.

#1. Assess adrenal androgen levels (Total DHEA). More information is available here.

- The total DHEA production is **3,365 ng/mg**, which is above the overall range, meaning it is high for women of any age. 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. More information is available here.

- Testosterone is **9.2 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-androstanediol. More information is available here.

- 5a-Androstanediol is **19.1 ng/mg**, which is within the optimal premenopausal range. 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. More information is available here.

- 5a-Metabolism of androgens is higher than **77.0%** of the population, which is within the range, but towards the high end. This indicates a mild preference for the more androgenic pathway. If paired with high androgens, this may contribute to androgen excess symptoms.

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 8 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

DAILY FREE CORTISOL PATTERN

Cortisol (ng/mg)

- Patient Values
- Normal Range

WAKING	+2 HOURS	DINNER	BEDTIME
08:14 AM	10:53 AM	05:48 PM	09:13 PM

#1

from pg 1

CORTISOL METABOLISM

#4

Cortisol Clearance Rate
THF + THE / Cortisol + Cortisone

Low | | | High

95%

Cortisol Metabolism

65 · 93 · 200

24 Hour Free Cortisol
Sum of all Values

#2

2750 · 6592 · 6500

Metabolized Cortisol
Total Cortisol Production (THF + THE)

#3

Cortisol-related Patient or Sample Comments:

- The patient reported significant fatigue in the afternoon/evening, but not in the morning.

#1. Assess the daily free cortisol pattern. More information is available here.

- 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). More information is available here.

- The 24hr Free Cortisol is **93.1 ng/mg**, which is within the optimal range.

#3. Assess the total cortisol produced by the adrenal glands (Metabolized Cortisol). More information is available here.

- The Metabolized Cortisol, which reflects the total cortisol output for the day, is **6,592 ng/mg**, which is above the optimal range.

#4. Assess the rate of cortisol clearance from the body. More information is available here.

- The Cortisol Clearance Rate is higher than **95.0%** 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.

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.

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.

#2. Assess if there is a preference for alpha metabolism of progesterone. More information is available [here](#).

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 **82.0%** of the population, which is above the normal range. This preference indicates more 5a metabolism compared to 5b progesterone metabolites. 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. More information is available [here](#).

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 levels are balanced with the primary estrogens (E1, E2). This indicates normal phase 1 estrogen clearance.

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 10 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

#4. Assess whether any of the estrogen-related organic acids are out of range. More information is available here.

Estrogen levels, metabolites, and metabolism patterns can be influenced by nutrient status, oxidative stress, and gut health. Imbalances in glutathione, B12, B6, gut dybiosis, and oxidative stress markers will be commented on here, if relevant for the patient. This may help identify contributing factors affecting estrogens.

ANDROGENS

#1. Assess if the DHEA-S is relatively lower than the Total DHEA. More information is available here.

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). More information is available here.

- 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. More information is available here.

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. More information is available here.

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. More information is available here.

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.

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

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

PRECISION ANALYTICAL INC. CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 11 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

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 **79.0%** of the population, which is within the optimal range, but towards the high end. This indicates a mild preference for cortisol metabolites compared to cortisone metabolites. If free cortisol levels are robust, this may contribute to high tissue cortisol. If cortisol levels are low, this may optimize cortisol levels by keeping what is available in its active form.

#3. Assess for anabolic-catabolic balance

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

- 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. More information is available [here](#).

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

PRECISION ANALYTICAL INC. CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

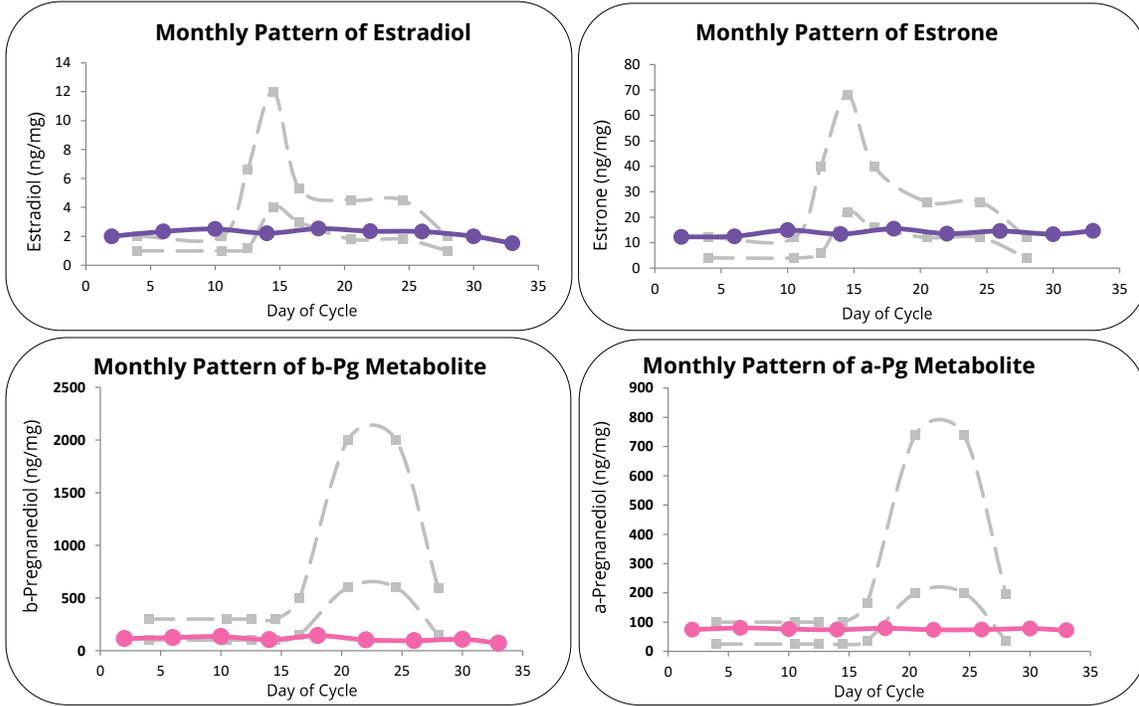Page 12 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

Reference Range Percentiles

Reference ranges are developed by testing thousands of healthy individuals, while excluding results from outliers or those on impactful medications. A percentile approach is applied, as is done with most labs. Classic reference ranges use the 95th percentile as the upper end of range and the 5th percentile as the lower end of range. Our DUTCH ranges uses the percentiles found in the table below. We feel these ranges reflect the more optimal range sought in functional medicine practices. The table below shows the percentiles used for the reference range of each analyte on the DUTCH report:

Female Reference Ranges (Updated 10.15.2025)								
	Low%	High%	Low	High		Low%	High%	Low	High
b-Pregnanediol	20%	90%	600	2000	Cortisol U0 (Mid-Sleep)	0	90%	0	16
a-Pregnanediol	20%	90%	200	740	Cortisol U1 (Waking)	20%	90%	10	50
Estrone (E1)	20%	80%	12	26	Cortisol U2 (+2 Hours)	20%	90%	30	130
Estradiol (E2)	20%	80%	1.8	4.5	Cortisol U3 (Dinner)	20%	90%	7	30
Estriol (E3)	20%	80%	5	18	Cortisol U4 (Bedtime)	0	90%	0	14
2-OH-E1	20%	80%	5.1	13.1	Cortisone U0 (Mid-Sleep)	0	90%	0	59
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 (+2 Hours)	20%	90%	90	230
2-Methoxy-E1	20%	80%	2.5	6.5	Cortisone U3 (Dinner)	20%	90%	32	110
2-OH-E2	0	80%	0	3.1	Cortisone U4 (Bedtime)	0	90%	0	55
4-OH-E2	0	80%	0	0.52	Cortisol Clearance Rate (CCR)	20%	80%	6	12.5
2-16-ratio	20%	80%	2.69	11.83	Melatonin (6-OHMS)	20%	90%	10	85
2-4-ratio	20%	80%	5.4	12.62	8-OHdG	0	90%	0	5.2
2Me-2OH-ratio	20%	80%	0.39	0.67	Methylmalonate	0	90%	0	2.5
DHEA-S	20%	90%	20	750	Xanthurenate	0	90%	0.12	1.2
Androsterone	20%	80%	200	1650	Kynurenate	0	90%	0.8	4.5
Etiocholanolone	20%	80%	200	1000	b-Hydroxyisovalerate	0	90%	0	12.5
Testosterone	20%	80%	2.3	14	Pyroglutamate	10%	90%	28	58
5a-DHT	0	80%	0	6.6	Indican	0	90%	0	100
5a-Androstanediol	20%	80%	6	30	Homovanillate	10%	95%	3	11
5b-Androstanediol	20%	80%	12	75	Vanilmandelate	10%	95%	2.2	5.5
Epi-Testosterone	20%	80%	2.3	14	Quinolinate	0	90%	0	9.6
a-THF	20%	90%	75	370	**Calculated Values**				
b-THF	20%	90%	1050	2500	Total DHEA Production	20%	80%	500	3000
b-THE	20%	90%	1550	3800	Total Estrogens	20%	80%	35	70
					Metabolized Cortisol	20%	90%	2750	6500
					24hr Free Cortisol	20%	90%	65	200
					24hr Free Cortisone	20%	90%	220	450

% = population percentile: Example - a high limit of 90% means results higher than 90% of the women tested for the reference range will be designated as "high."

PRECISION ANALYTICAL INC. CREATORS OF THE DUTCH TEST®

Precision Analytical (Dawn Huo, Ph.D., Lab Director)
3138 NE Rivergate Street
McMinnville, OR 97128

Female Sample Report
Accessioned - 10/20/2025
Final Report - 2/12/2026

Page 13 of 13
CLIA Lic. #38D2047310
Report Version 1.6.0

Name: Female Sample Report
D.O.B. 01/01/94
Collection Dates:
9/10-10/12/2025
Provider: Precision Analytical
Accession # 1094137

dutchtest®
CYCLE MAPPING

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.

Monthly Pattern of Estradiol

Monthly Pattern of Estrone

Monthly Pattern of b-Pg Metabolite

Monthly Pattern of a-Pg Metabolite

All values given in ng/mg creatinine

Measurement	1	2	3	4	5	6	7	8	9
Day(s) of Cycle	1,3	5,7	9,11	13,15	17,19	21,23	25,27	29,31	33

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)	2.00	2.33	2.51	2.21	2.53	2.35	2.33	1.99	1.52
Estrone (E1)	12.2	12.5	14.9	13.4	15.5	13.5	14.6	13.3	14.6
a-Pregnanediol	74	80	76	74	79	74	74	78	72
b-Pregnanediol	115	124	135	104	**143**	103	95	108	72
b-Pregnanediol/E2 Ratio	58	53	54	47	57	44	41	54	48
Creatinine	0.90	1.73	1.34	1.80	1.71	1.84	1.44	2.01	

Sample (#5) with the highest b-Pg value (143) 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.

PRECISION ANALYTICAL INC.
CREATORS OF THE DUTCH TEST®

Precision Analytical Inc (Dawn Huo, PhD, Lab Director)
3138 NE Rivergate St.
McMinnville, OR 97128

Accession Date: 01/00/00
Report Date: 02/12/2026

Page 1 of 2
CLIA #38D2047310

Name: Female Sample Report
D.O.B. 01/01/94
Collection Dates:
9/10-10/12/2025
Provider: Precision Analytical
Accession # 1094137

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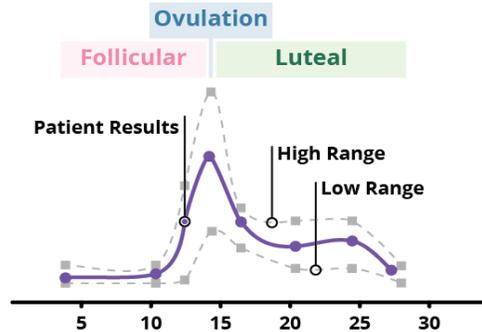
For most cycles <34 days, measurements are made from single days, selected to best represent overall patterns of ovulatory & luteal peaks. The day 4 sample set is usually collected at the end of the cycle, four days after menses (used for DUTCH Complete/Plus), but is plotted at the beginning of the cycle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

Precision Analytical Inc (Dawn Huo, PhD, Lab Director)
3138 NE Rivergate St.
McMinnville, OR 97128

Accession Date: 01/00/00
Report Date: 02/12/2026

Page 2 of 2
CLIA #38D2047310