dutchtest® COMPLETE

MedPrimex

Accession # 01035999

Female Sample Report
123 A Street
Sometown, CA 90266

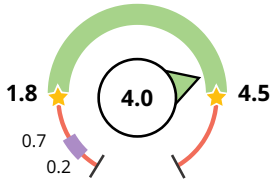
DOB: 1976-01-01
Age: 46
Sex: Female
Last Menstrual Period:
2022-05-25

Collection Times:

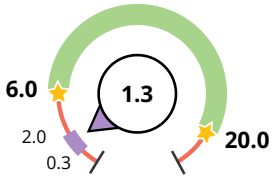
2022-06-13 04:00AM (U)
2022-06-13 06:00AM (U)
2022-06-13 03:00PM (U)
2022-06-13 08:00PM (U)

Hormone Testing Summary

ESTROGEN & PROGESTERONE



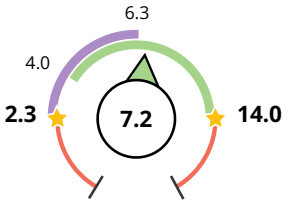
Estradiol (E2)



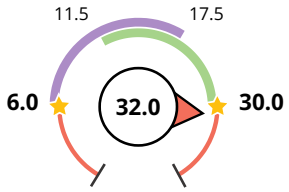
Progesterone

Serum Equivalent*, ng/mL

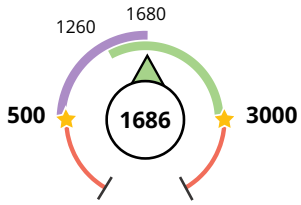
ANDROGENS



Testosterone



5a-Androstanediol

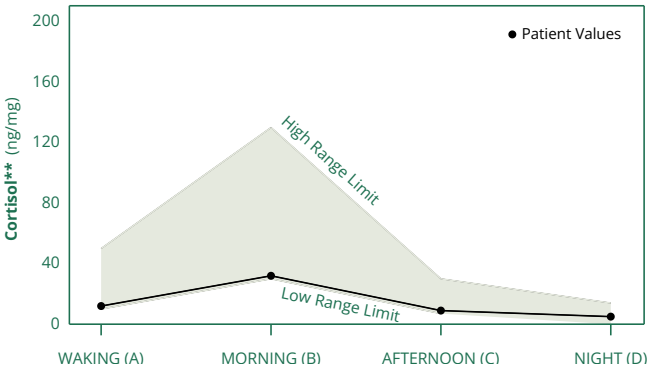


Total DHEA Production

DHEA-S + Etiocholanolone + Androsterone

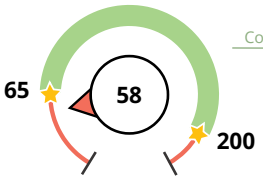
CORTISOL

Daily Free Cortisol Pattern



Cortisol Clearance Rate

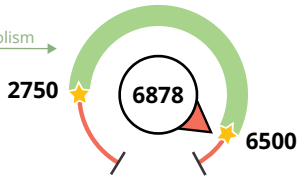
THF + THE / Cortisol + Cortisone



24hr Free Cortisol

A + B + C + D

Cortisol Metabolism



Metabolized Cortisol

Total Cortisol Production (THF + THE)

Optimal Luteal Range | Postmenopausal Range | Out of Range | Edge of Range

*Progesterone Serum Equivalent is a calculated value based on urine pregnanediol.
**Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.

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123 A Street
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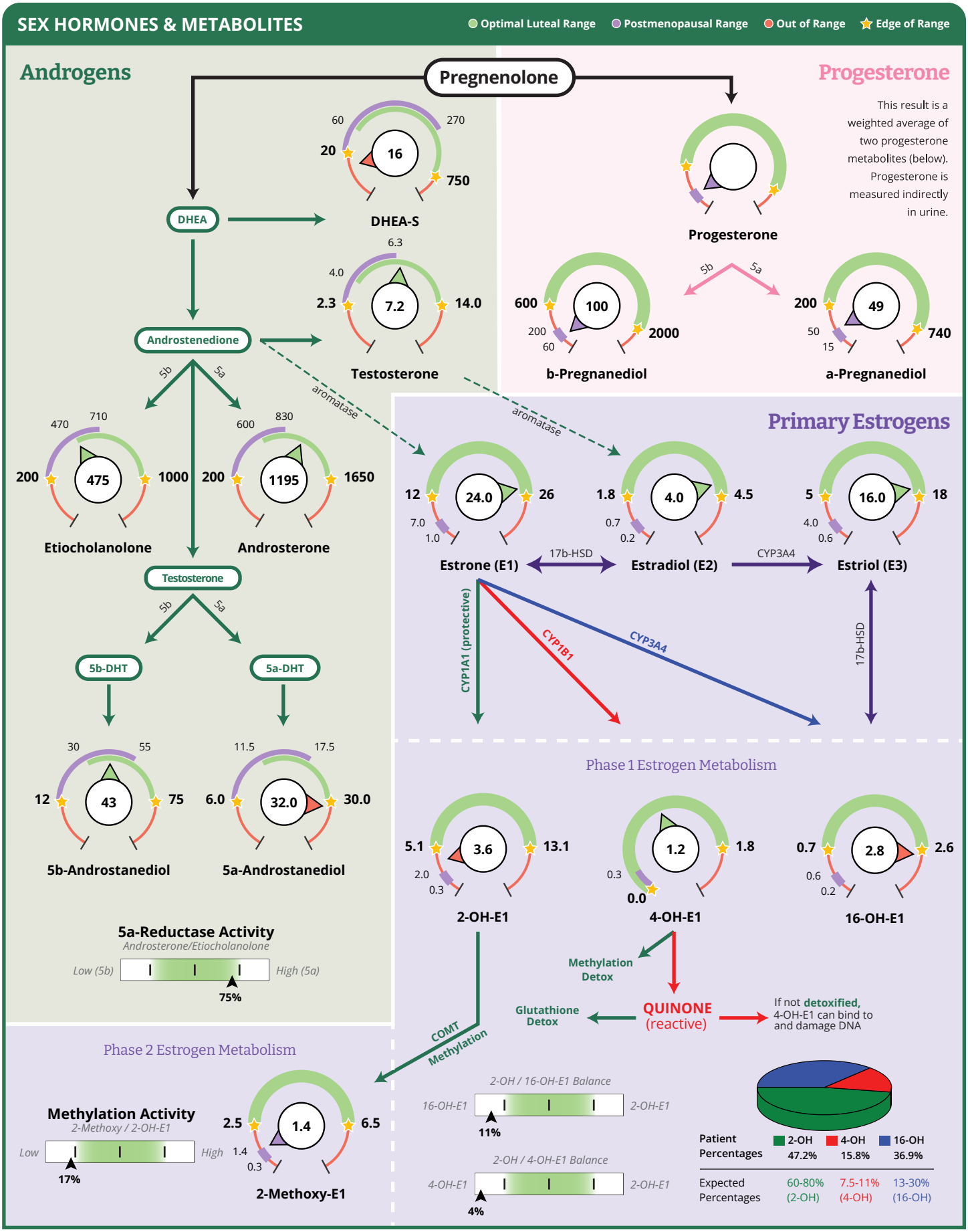
2022-06-13 06:00AM (U)
2022-06-13 03:00PM (U)
2022-06-13 08:00PM (U)

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	High end of range	6.2	ng/mg	0 - 6.6	
5a-Androstanediol	Above range	32.0	ng/mg	6 - 30	
5b-Androstanediol	Within range	42.6	ng/mg	12 - 75	
Epi-Testosterone	Within range	8.6	ng/mg	2.3 - 14	

* The Luteal Range represents the expected premenopausal luteal range, collected menstrual cycle days 19-22 of a 28-day cycle. If your patient noted taking oral progesterone, the reference range represents the expected range on 100 - 200 mg of oral micronized progesterone (OMP). The ranges in the table below represent ranges in other times of the cycle your patient may have collected, such as follicular or ovulatory phases.

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


SEX HORMONES & METABOLITES
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.
DHEA
DHEA-S
60
270
20
16
750
Progesterone
Androstenedione
Testosterone
6.3
4.0
2.3
7.2
14.0
5b
5a
600
100
200
60
2000
b-Pregnanediol
200
49
50
15
740
a-Pregnanediol
aromatase
Etiocholanolone
470
710
200
475
1000
Androsterone
600
830
200
1195
1650
Testosterone
5b-DHT
5a-DHT
5b-Androstanediol
30
55
12
43
75
5a-Androstanediol
11.5
17.5
6.0
32.0
30.0
5a-Reductase Activity
Androsterone/Etiocholanolone
Low (5b)
High (5a)
75%
Primary Estrogens
Estrone (E1)
12
24.0
26
7.0
1.0
Estradiol (E2)
1.8
4.0
4.5
0.7
0.2
Estriol (E3)
5
16.0
18
4.0
0.6
17b-HSD
CYP3A4
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 Detox
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%
Patient Percentages
2-OH 47.2%
4-OH 15.8%
16-OH 36.9%
Expected Percentages
60-80% (2-OH)
7.5-11% (4-OH)
13-30% (16-OH)

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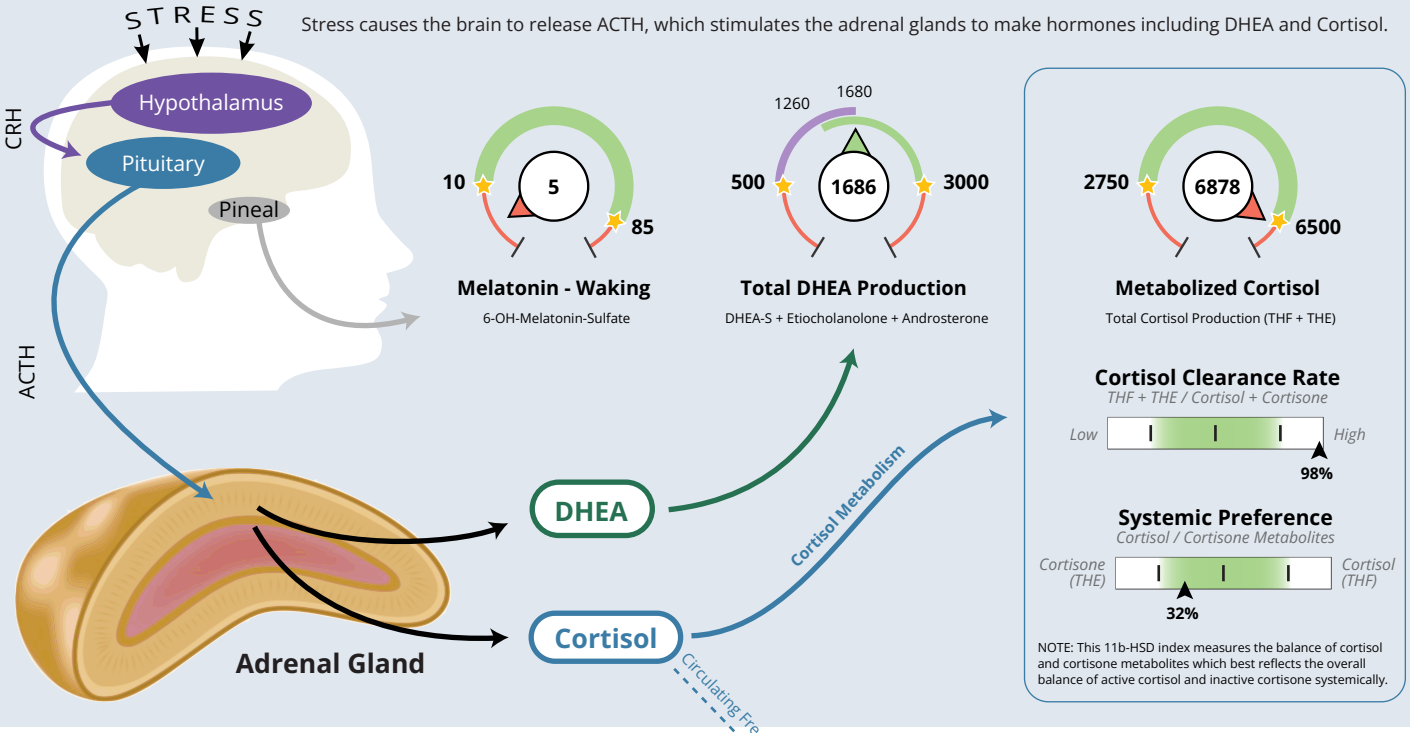
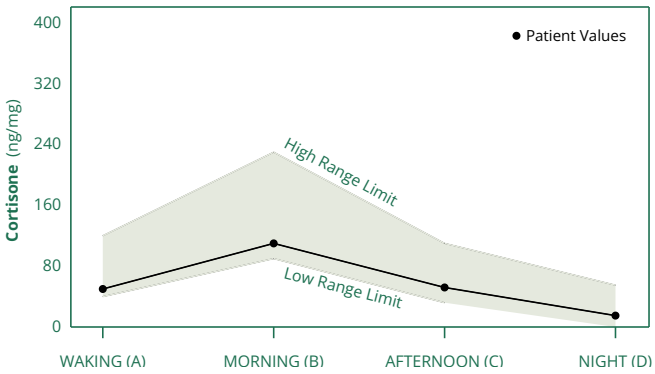
Adrenal Hormones & Metabolites

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

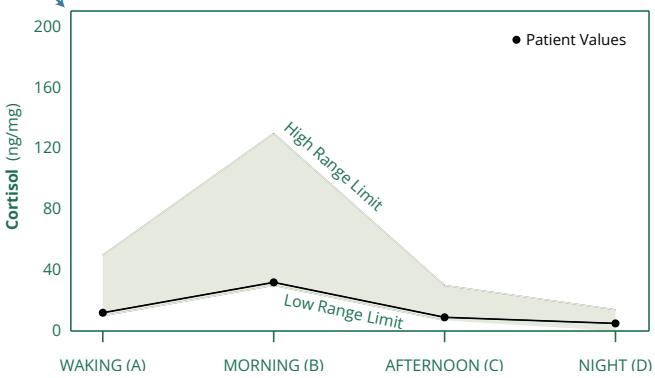
ADRENAL HORMONES & METABOLITES

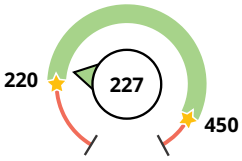


Daily Free Cortisone Pattern



Daily Free Cortisol Pattern

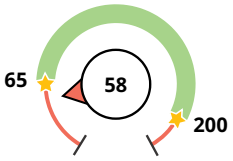




24hr Free Cortisone

A + B + C + D

Cortisol and Cortisone interconvert (11b-HSD)



24hr Free Cortisol

A + B + C + D

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Organic Acid Tests (OATs)

TEST		RESULT	UNITS	NORMAL RANGE
Nutritional Organic Acids (Urine)				
Vitamin B12 Marker - May be deficient if high				
Methylmalonate (MMA)	Above range	4.9	ug/mg	0 - 2.5
Vitamin B6 Markers - May be deficient if high				
Xanthurenate	Above range	1.23	ug/mg	0.12 - 1.2
Kynurenate	Above range	5.4	ug/mg	0.8 - 4.5
Biotin Marker - May be deficient if high				
b-Hydroxyisovalerate	Within range	7.9	ug/mg	0 - 12.5
Glutathione Marker - May be deficient if low or high				
Pyroglutamate	Within range	42.0	ug/mg	28 - 58
Gut Marker - Potential gut putrefaction or dysbiosis if high				
Indican	Above range	114.0	ug/mg	0 - 100
Neuro-Related Markers (Urine)				
Dopamine Metabolite				
Homovanillate (HVA)	Within range	4.4	ug/mg	3 - 11
Norepinephrine/Epinephrine Metabolite				
Vanilmandelate (VMA)	Within range	4.3	ug/mg	2.2 - 5.5
Neuroinflammation Marker				
Quinolinate	Above range	13.2	ug/mg	0 - 9.6
Additional Markers (Urine)				
Melatonin - Waking				
6-OH-Melatonin-Sulfate	Below range	5.3	ng/mg	10 - 85
Oxidative Stress / DNA Damage				
8-Hydroxy-2-deoxyguanosine (8-OHdG)	Within range	2.6	ng/mg	0 - 5.2

Clinical Support Overview

Thank you for choosing DUTCH for your functional endocrinology testing needs!

Please take a moment to read through the Clinical Support Overview below. These comments are specific to the patient's lab results. These comments are intended for educational purposes only. Specific treatment should be managed by a healthcare provider.

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

Alert Comments:

How to read the DUTCH report

This report is not intended to treat, cure or diagnose any specific diseases.

DUTCH DIALS

The graphic dials in this report are intended for quick and easy evaluation of hormone levels. The green highlighted area between the stars shows the normal range. Results below the left star and beyond the right star are shaded red representing below and above the normal range respectively. The arrow points to the patient's result and will be the color of the result status (ie red for out of range, green for in range).

Low Example

Normal Example

High Example

NEW! - AGE DEPENDENT RANGES

Age-dependent ranges for females are oriented around optimal **premenopausal** and **postmenopausal** levels.

For estrogen and progesterone dials, the optimal premenopausal range is captured during the luteal phase of the menstrual cycle. The premenopausal range is shown in green, and the postmenopausal range is shown in purple, with **no overlap**. Due to the dramatic decline in estrogen and progesterone during the menopausal transition, the purple band is separate on the left hand (low) side of the dial.

Estrogen & Progesterone

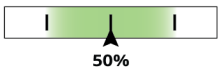
For female androgens, the optimal premenopausal range is not significantly affected by the phase in the menstrual cycle or menopause but declines with age more gradually. The premenopausal range is shown in green, and the postmenopausal range is shown in purple, with some overlap. Note that the arrow pointer changes color to the range it points to, with a preference for the premenopausal green when the ranges overlap.

Androgens

Optimal Luteal or Premenopausal Range Postmenopausal Range Out of Range

DUTCH SLIDERS

The graphic sliders indicate the relative ratio of the metabolites noted on the slider. The percentage stated is a population percentage. A result of 50% indicates that the ratio is higher than 50% of individuals tested, or right in the middle of the population's range. If the result is lower than 50% it will move to the left and higher than 50% will move to the right. The normal range is shaded green and out of range is shaded white.



For more information about the new slider bars, please click to read our **DUTCH Blog**.

Patient or Sample Comments

You will find comments specific to the patient results in each section below in bulleted text. Please refer to our DUTCH resources for further information on interpreting results.

- The patient reports regular menstrual cycles.

PROGESTERONE

The progesterone dial shows the weighted average of the two main urinary metabolites of progesterone, 5b-pregnanediol and 5a-pregnanediol.

- The weighted average of the two progesterone metabolites shows that progesterone is low for the luteal phase of the menstrual cycle. The ideal collection timing for capturing peak luteal levels occurs 4-9 days before menses. The patient reports irregular cycles, so check in with the patient about the timing of sample collection in relation to menstruation. Patients with irregular cycles experience less progesterone exposure overall due to anovulatory cycles, the most common cause of irregularity. Women over 40 who are experiencing irregular cycles may be experiencing perimenopause, another common cause of irregular cycles and low progesterone.

ESTROGEN

When evaluating estrogen levels, it is important to assess the following:

Estrogen Levels
The primary ovarian hormone, estradiol (the strongest estrogen), and "total estrogen" levels should be reviewed with the appropriate reference range (premenopausal or postmenopausal). For women on HRT, check in with DUTCH resources on specific HRT types and monitoring.

Estrogen Metabolism

- The 2-OH/16-OH-E1 is low. This indicates less 2-OH and/or more 16-OH. The 2-OH is considered a beneficial phase 1 detox pathway because it is stable, anti-estrogenic, and anti-carcinogenic. But in this case there is more 16-OH-E1 which is not ideal because this pathway is more estrogenic, proliferative, and is associated with inflammation.
- The 2-OH/4-OH-E1 is low. This indicates less 2-OH and/or more 4-OH. The 2-OH is considered a beneficial phase 1 detox pathway because it is stable, anti-estrogenic, and anti-carcinogenic. But in this case there is more 4-OH-E1 which is not ideal because this pathway is unstable, can form reactive quinones that cause DNA damage, and has been associated with increased breast cancer risk.
- The methylation slider shows the patient has slow estrogen methylation. Estrogen is methylated via the COMT enzyme, which can be impacted by nutrient deficiency and COMT genetic polymorphisms. Testing for COMT gene polymorphisms may also be helpful, depending on the case.

ANDROGENS
When evaluating androgen levels, it is important to assess the following:

Androgen Levels
Review Testosterone and Total DHEA levels for insight into androgen production. While urinary testosterone levels generally agree well with serum testosterone levels, there are some cases where they do not. We recommend using serum testing to confirm a low testosterone result on the DUTCH test.

- Women aged 41-55 may be within or below the optimal premenopausal range. Symptoms plus other androgens are important for assessing if the levels are appropriate for the patient. This is the normal age for perimenopause and menopause which, for different women, can vary by years. Therefore, this age group should view the expected androgen levels with both optimal premenopausal and postmenopausal ranges in mind.

Androgen Metabolism
5a-reductase converts testosterone into 5a-DHT (DHT), which is even more potent (~3x) than testosterone. The best representation of tissue 5a-DHT and overall androgen status, is 5a-Androstanediol. Metabolites created down the 5b-pathway are significantly less androgenic than their 5a counterparts.

- The 5a-Androstanediol is high. 5a-androstanediol is a target tissue metabolite of 5a-DHT, the body's most potent androgen. 5a-androstanediol levels represent tissue 5a-DHT better than measuring 5a-DHT directly, whether in urine or serum, because 5a-DHT typically remains in target tissues until it is metabolized into 5a-androstanediol. High 5a-androstanediol indicates high tissue androgens even in the absence of high testosterone or DHEA metabolites. Review the full status of androgens, including symptoms, before considering a treatment plan. You can find more information about this here.
- The DHEA-S is lower than the other major metabolites of DHEA, etiocholanolone and androsterone. DHEA-S is mostly formed in the adrenal glands via sulfation. Inflammation can block sulfation. This lowers the DHEA-S and drives the 5a & 5b-reductase enzymes, metabolizing DHEA away from DHEA-S. Consider addressing inflammation and adrenal health.

CORTISOL
Review the daily pattern of free cortisol throughout the day, looking for low and high levels and noting what time they occur. Next review the sum of free cortisol as an expression of overall tissue cortisol exposure.

Free Cortisol Levels

- While free cortisol levels are low, these results can be somewhat misleading in this case. Overall cortisol production is best approximated by levels of metabolized cortisol, which are elevated. This implies that overall the HPA-Axis activity is elevated. Cortisol clearance is up-regulated in this patient, leaving them with low levels of free cortisol. The patient's cortisol status may be different depending on the location within the body. For example, the conversion from noradrenaline to adrenaline is driven by cortisol and takes place within the adrenal medulla. In this case, this area is likely flooded with high levels of cortisol forcing conversion to adrenaline, whereas the brain (where cortisol has negative feedback on ACTH production) may be cortisol deficient. Efforts to increase HPA-Axis activity may exacerbate some symptoms. Calming the HPA-Axis, while supporting it in ways that are not excitatory, may be the best course of action.

Cortisol Metabolism

- The Cortisol Clearance Rate is high. This indicates the level of metabolized cortisol exceeds the level of free cortisol and free cortisone. Fast cortisol clearance occurs with elevated levels of 5a and 5b-reductase.

This occurs mostly in obesity and insulin resistance but can also be seen with hyperthyroidism or too much thyroid medication. The HPA axis can adjust cortisol excretion to maintain normal levels of free cortisol, but fast clearance can result in upregulation of ACTH and all adrenal products (such as DHEA). In some cases, fast cortisol clearance leads to low free cortisol and low symptoms.

NUTRITIONAL ORGANIC ACIDS

Organic acids begin to build up when a nutrient cofactor or mineral is not present for a specific reaction to occur.

- The MMA is high. Elevated urinary MMA indicates impaired vitamin B12 dependent enzymatic activity and is a reliable marker of functionally low B12 status. Vitamin B12 is important for estrogen detoxification (phase 2 methylation), neurotransmitter production and function, among others. Signs and symptoms of low B12 include fatigue, megaloblastic anemia, numbness and tingling in the hands and feet, mood changes, and more.
- Xanthurenate and kynurenate are both high. This can indicate low vitamin B6 from not eating B6, not absorbing it, not activating it, not having the co-factors to activate it/circulate it, or from conditions like pyroluria that bind up B6, impairing absorption. B6 is important for estrogen methylation and neurotransmitter production and can help make cysteine (glutathione/pyroglutamate) in the transsulfuration pathway. If tryptophan supplements are taken within 72 hours of collecting DUTCH samples, xanthurenate and kynurenate can be high in the urine without indicating any health conditions or deficiency. Keep supplements in mind when interpreting results.
- The indican is high. Elevated indican can indicate gut dysbiosis. Once elevated, levels do not correlate with the severity of dysbiosis, but simply that dysbiosis is present. Consider further testing for insight into gut health if the symptom picture fits.

NEURO-RELATED MARKERS

- The quinolinate is high. Tryptophan is normally metabolized in the liver to produce NAD and small amounts of 5-HTP. When high cortisol or inflammatory cytokines are present, extra-hepatic tryptophan metabolism is activated and leads to high quinolinate production. High quinolinate can cross the blood-brain-barrier and is excitatory and toxic, potentially leading to mood and sleep dysregulation.

ADDITIONAL MARKERS

- 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.

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 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."