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Dried Urine Test for Comprehensive Hormones

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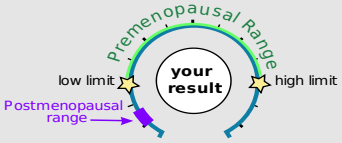
Hormone Testing Summary

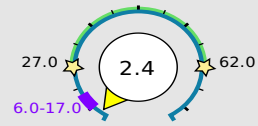
All units are given in ng/mg creatinine



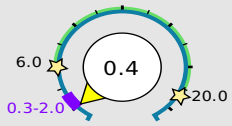
How to read the graphical representation of results

Sex Hormones

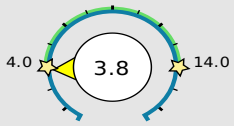
See Pages 2 and 3 for a thorough breakdown of sex hormone metabolites



Total Estrogen
(Sum of 8 Estrogen Metabolites)



Progesterone
(Serum Equivalent, ng/mL)

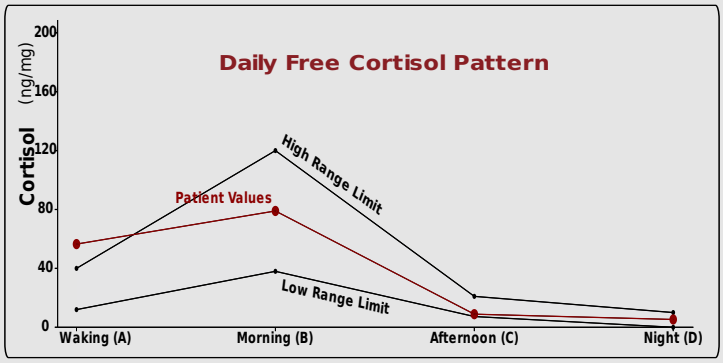


Testosterone

Progesterone Serum Equivalent is a calculated value based on urine pregnanediol.

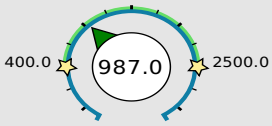
Adrenal Hormones

See pages 4 and 5 for a more complete breakdown of adrenal hormones

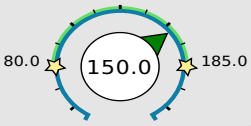


Total DHEA Production

Age	Range
20-40	800-2500
40-60	530-1550
>60	400-1350

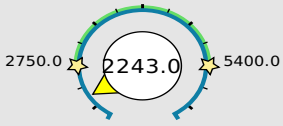


Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)



24hr Free Cortisol
(A+B+C+D)

cortisol metabolism



Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.

Patient reports no menstrual cycles
Last Menstrual Period -

Thank you for testing with us!

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Please be sure to always read below for any specific lab comments. More detailed comments can be found on page 7.

- The patient shows significantly higher free cortisol compared to metabolized cortisol. It may be advisable to check thyroid hormones if you have not. See comments in the notes for more details.

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Your DUTCH Complete report will include a summary (page 1), a list of all of the hormones tested and their ranges (pages 2,4) as well as a graphical representation of the results (pages 3,5). You will also see a steroid pathway for your reference (page 6) and provider notes.
This report is not intended to treat, cure or diagnose any specific diseases.
There is a series of videos in our video library at dutchtest.com that you may find useful in understanding the report. The following videos (which can also be found on the website under the listed names) may be particularly helpful in aiding your understanding:
DUTCH Complete Overview (quick overview)
Estrogen Tutorial; Androgen Tutorial; Cortisol Tutorial

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Dried Urine Test for Comprehensive Hormones

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Sex Hormones and Metabolites

Category	Test		Result	Units	Normal Range
Progesterone Metabolism					Premenopausal, luteal range shown.* See below for other ranges. (*unless taking oral Pg)
	b-Pregnanediol	Below premenopausal range	71.0	ng/mg	450 - 2300
	a-Pregnanediol	Below premenopausal range	15.0	ng/mg	120 - 740
Androgen Metabolism					
	DHEAS	Within range	167.0	ng/mg	23 - 350
	Androsterone	Below range	372.0	ng/mg	399 - 1364
	Etiocholanolone	Low end of range	448.0	ng/mg	371 - 765
	Testosterone	Below range	3.8	ng/mg	4 - 14
	5a-DHT	Within range	2.0	ng/mg	0 - 8.8
	5a-Androstanediol	Below range	7.5	ng/mg	12 - 30
	5b-Androstanediol	Below range	13.2	ng/mg	20 - 75
	Epi-Testosterone	Below range	0.7	ng/mg	4.5 - 22.3
Estrogen Metabolites					
	Estrone(E1)	Below premenopausal range	1.1	ng/mg	12 - 26
	Estradiol(E2)	Below premenopausal range	0.1	ng/mg	1.8 - 4.5
	Estriol(E3)	Below premenopausal range	0.1	ng/mg	5 - 18
	2-OH-E1	Below premenopausal range	0.8	ng/mg	4.6 - 14.4
	4-OH-E1	Within range	0.1	ng/mg	0 - 1.8
	16-OH-E1	Below premenopausal range	0.1	ng/mg	1 - 3.5
	2-Methoxy-E1	Below premenopausal range	0.2	ng/mg	2 - 5.5
	2-OH-E2	Low end of range	0.04	ng/mg	0 - 1.2

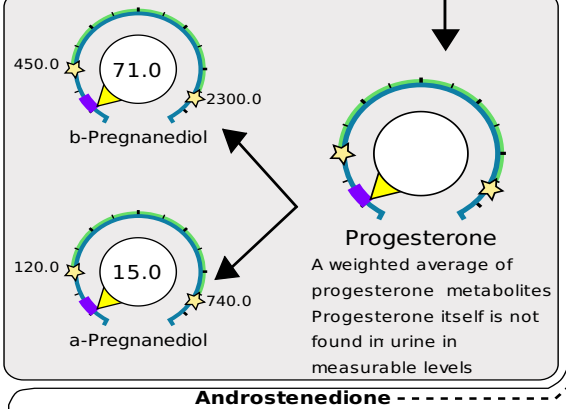
Normal Ranges	Luteal	Postmenopausal		Follicular	Ovulatory
Estrone (E1)	12-26	3.0-7.0		4.0-12.0	22-68
Estradiol (E2)	1.8-4.5	0.3-0.9		1.0-2.0	4.0-12.0
Estriol (E3)	5-18	1.5-4.0		N/A	N/A
2-OH-E1	4.6-14.4	0.4-2.0		N/A	N/A
4-OH-E1	0-1.8	0-0.3		N/A	N/A
16-OH-E1	1-3.5	0.2-0.6		N/A	N/A
2-Methoxy-E1	2-5.5	0.5-1.4		N/A	N/A
			Oral Pg (100mg)		
a-Pregnanediol	120-740	15-50	580-3000	25-100	25-100
b-Pregnanediol	450-2300	60-200	2000-9000	100-300	100-300

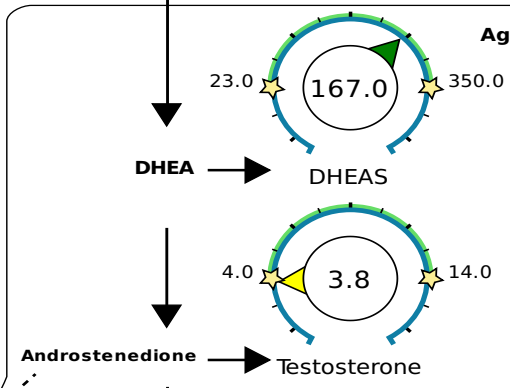
HOW TO READ YOUR RESULTS: Hormones are presented on this page graphically in the order the body metabolizes them. Arrows represent conversion from one hormone to another. The stars represent the low and high limits of the reference ranges (see example, right). The number in the middle is your result.

Progesterone Metabolism female

Pregnenolone

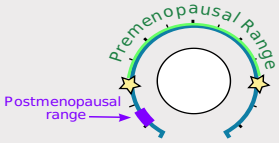
Androgen Metabolism

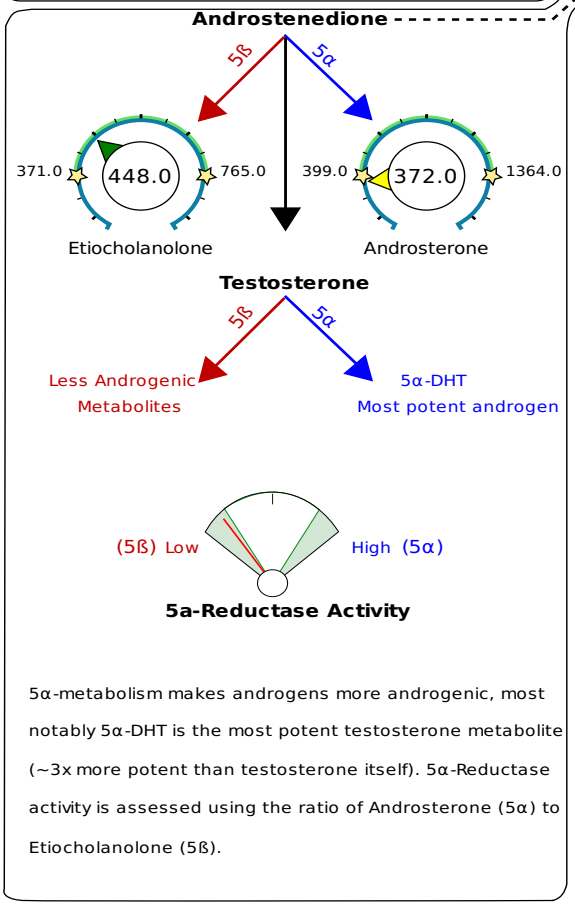


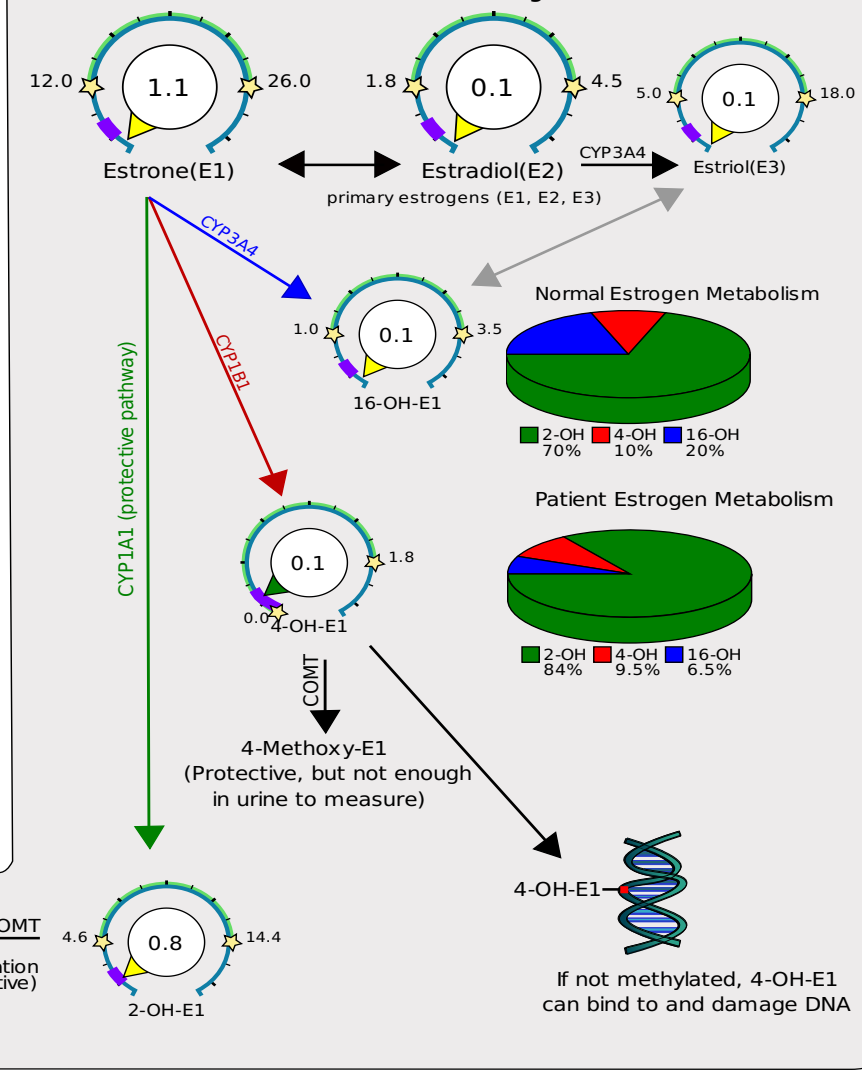


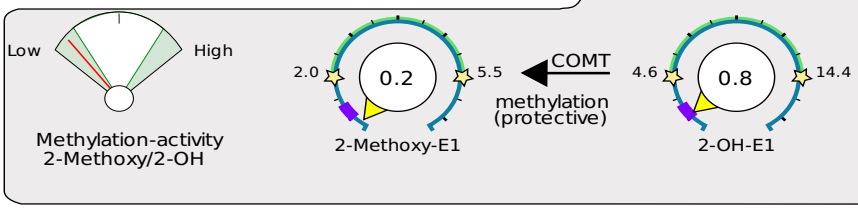
Age-Dependent DHEAS Ranges

Age	DHEAS
20-40	30-350
40-60	10-100
>60	5-50









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Dried Urine Test for Comprehensive Hormones

Advanced Adrenal Assessment

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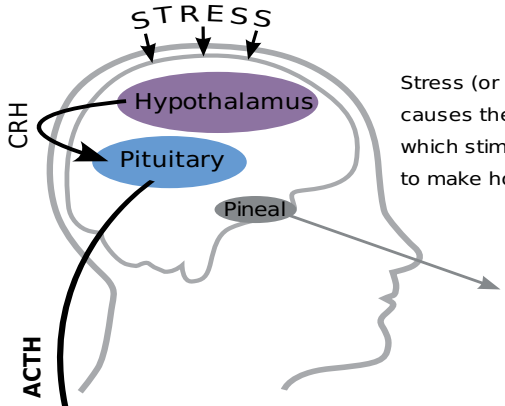
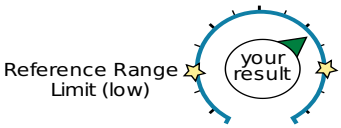
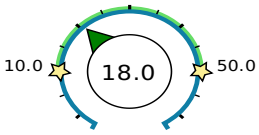
Category	Test		Result	Units	Normal Range
Creatinine					
	Creatinine A (Waking)	Within range	0.21	mg/ml	0.2 - 2
	Creatinine B (Morning)	Within range	0.47	mg/ml	0.2 - 2
	Creatinine C (Afternoon)	Below range	0.17	mg/ml	0.2 - 2
	Creatinine D (Night)	Within range	0.26	mg/ml	0.2 - 2
Daily Free Cortisol and Cortisone					
	Cortisol A (Waking)	Above range	56.5	ng/mg	12 - 40
	Cortisol B (Morning)	Within range	79.0	ng/mg	38 - 120
	Cortisol C (Afternoon)	Low end of range	8.9	ng/mg	7.3 - 21
	Cortisol D (Night)	Within range	5.3	ng/mg	0 - 10
	Cortisone A (Waking)	Above range	146.6	ng/mg	40 - 100
	Cortisone B (Morning)	Below range	66.6	ng/mg	90 - 200
	Cortisone C (Afternoon)	Within range	59.3	ng/mg	32 - 80
	Cortisone D (Night)	Within range	24.7	ng/mg	0 - 42
	24hr Free Cortisol	Within range	150.0	ug	80 - 185
	24hr Free Cortisone	Within range	297.0	ug	220 - 400
Cortisol Metabolites and DHEAS					
	a-Tetrahydrocortisol (a-THF)	Below range	66.0	ng/mg	75 - 265
	b-Tetrahydrocortisol (b-THF)	Low end of range	1146.0	ng/mg	1050 - 2070
	b-Tetrahydrocortisone (b-THE)	Below range	1032.0	ng/mg	1550 - 3150
	Metabolized Cortisol (THF+THE)	Below range	2243.0	ng/mg	2750 - 5400
	DHEAS	Within range	167.0	ng/mg	23 - 350
Melatonin (*measured as 6-OH-Melatonin-Sulfate)					
	Melatonin* (Waking)	Within range	18.0	ng/mg	10 - 50



Stress (or inflammation) causes the brain to release ACTH, which stimulates the adrenal glands to make hormones



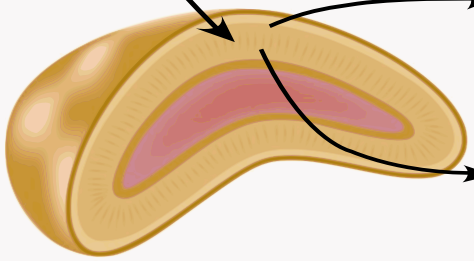


Melatonin* (Waking)

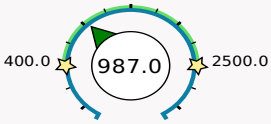
Total DHEA Production

Age	Range
20-40	800-2500
40-60	530-1550
>60	400-1350

Adrenal Gland



DHEA

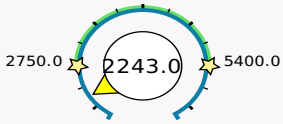


Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)

A patient's catabolic vs anabolic balance can be estimated by observing relative DHEA (anabolic) vs cortisol (catabolic) production

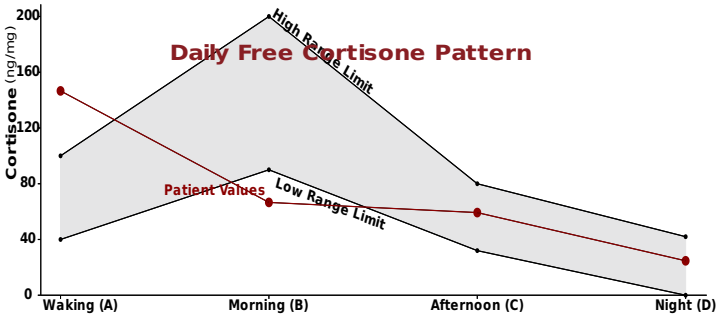
Cortisol

Cortisol Metabolism

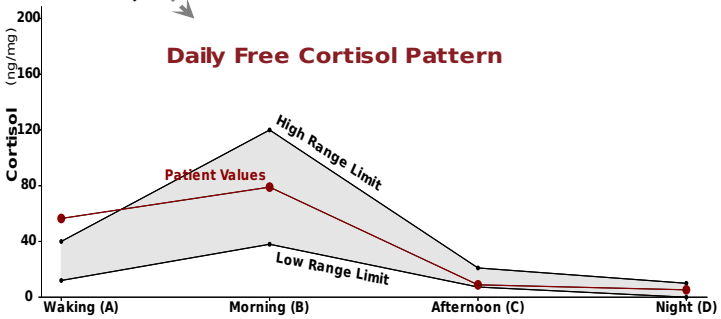


Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Circulating Free Cortisol



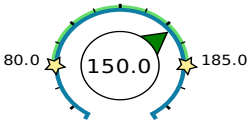
Note: "Waking" samples reflect overnight production



24hr Free Cortisone
(A+B+C+D)

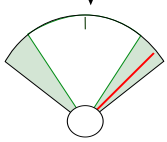
Cortisol and Cortisone interconvert (11b-HSD)

and are metabolized to THF & THE for excretion



24hr Free Cortisol
(A+B+C+D)

NOTE: The balance between free cortisol and free cortisone reflects the kidney's conversion of cortisol to cortisone. See below for the overall preference between cortisol and cortisone.



More cortisone metabolites (THE)

More cortisol metabolites (THF)

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.

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Primary hormones (in CAPS) are made by organs by taking up cholesterol ★ and converting it locally to, for example, progesterone. Much less is made from circulating precursors like pregnenolone. For example, taking DHEA can create testosterone and estrogen, but far less than is made by the testes or ovaries, respectively.

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Dried Urine Test for Comprehensive Hormones

Steroid Pathways

Find these Hormones on the DUTCH Complete

Cholesterol ★

Spironolactone, Congenital adrenal hyperplasia (CAH), ketoconazole (–)

Pregnenolone

17-hydroxylase

17-OH-Pregnenolone

(+) High insulin, PCOS, hyperglycemia, stress, alcohol

Spironolactone, aging, dioxin exposure, licorice (–)

17,20 Lyase

DHEAS (Sulfate)

Inflammation (–)

DHEA

Where is it made? Adrenal gland

17bHSD

Androstenediol

Progestins, isoflavonoids, metformin, heavy alcohol use (–)

PCOS, high insulin, forskolin, IGF-1 (+)

Where is it made? Testes in men, from the ovaries and adrenal DHEA in women.

3bHSD

Where is it made? Ovaries – less from adrenals

PROGESTERONE

17-hydroxylase

17-OH-Progesterone

17,20 Lyase

Androstenedione

17bHSD

TESTOSTERONE

Chrysin, zinc, damiana, flaxseed, grape seed extract, nettles, EGCG, ketoconazole, metformin, anastrazole (–)

*5a

5b

a-Pregnanediol

b-Pregnanediol

Etiocholanolone

5b-Androstanediol

5a-DHT

Inflammation, excess adipose, high insulin, forskolin, alcohol (+)

Epi-Testosterone

Aromatase (CYP19)

3αHSD

Androsterone

17bHSD

5a-Androstanediol

Where is it made? Ovaries – lesser amounts elsewhere from DHEA/ Testosterone.

CYP21

CYP11b1

Where is it made? Adrenal gland

More Cortisone: Hyperthyroidism, hGH, E2, ketoconazole, quality sleep, magnolia, scutellaria, zizyphus, testosterone, citrus peel extract

CORTISOL (active)

11b-HSD

Cortisone (inactive)

More Cortisol: Hypothyroid, licorice, grapefruit, inflammation, visceral obesity, high insulin, excess sodium

Inflammation, visceral obesity, DHEA, forskolin, alcohol (+)

Estrone (E1)

17bHSD

ESTRADIOL (E2)

Phytoestrogens, licorice, progestins, tamoxifen (–)

CYP-3A4

3A4

Grapefruit, noni & pomegranate juice, peppermint oil, antifungals, valerian (–)

CYP-1B1

16-OHE1

17bHSD

Estriol (E3)

Hops, bioflavonoids, grapefruit (–)

CYP-1A1

PAHs, PCBs (+)

4-OHE1

COMT

4-MeOE1

Cruciferous veggies, DIM (Diindolylmethane), I-3-C (Indole-3-Carbinol), berries (+)

Methylation of 2-OH/4-OH estrogens is slowed with certain genetic variants (MTHFR, COMT)

2-OHE1

COMT (–)

2-MeOE1

(+)

Magnesium (Mg deficiency induced by corticosteroids, estrogen, sulfonamides, acid blockers, thiazide diuretics, coffee, alcohol, tamoxifen)

Methyl Donors (SAMe, B Vitamins, TMG, Choline, Folate, Methionine)

a-THF

b-THF

THE

Cortisol Metabolism/Clearance

Cortisol is metabolized by 5a/5b-reductase (and 3a-HSD) to a/b-THF & THE for excretion. This process is particularly increased in obesity, high insulin and hyperthyroid. It may be slowed in cases of hypothyroidism, anorexia or poor liver function.

*5a-Reductase

5a-Reductase is best known because it makes androgens like testosterone more potent. It is also responsible for metabolizing progesterone and cortisol. If up-regulated, it may cause high androgen symptoms. In men (thinning hair, prostate) and women (as in PCOS, thinning hair, acne, facial hair growth). 5b-Metabolites are less androgenic (weaker).

5a-Reductaise is increased in particular by: High Insulin and obesity.

5a-Reductase may be decreased by: Saw palmetto nettles, pygeum, EGCG, progesterone, zinc, medications like Finasteride.

5b-Reductase may be affected by some of the above listed things as well (often to a lesser degree).

Other factors affecting the production of primary reproductive and adrenal hormones:

Increased Cortisol: stress, inflammation, Cushing's Disease, obesity
Decreased Cortisol: glucocorticoid use, opioid use, Addison's Disease, Accutane, chronic marijuana use
Increased DHEA: PCOS, acute stress, Bupropion (Wellbutrin), Alprazolam (Xanax), ADD meds
Decreased DHEA: aging, rapid weight loss, Venlafaxine/Mirtazapine, opioids, glucocorticoids, hormonal birth control, antipsychotic meds, estrogens, diabetes meds
Increased Testosterone: PCOS, HCG, HGH, L-Dopa, Climiphene Citrate (Clomid)
Decreased Testosterone: obesity, opioids, hormonal birth control, acute illness, aging, high insulin, steroid use
Increased Estrogens: PCOS, inflammation, pregnancy, DHEA/testosterone supplementation
Decreased Estrogens: hormonal birth control, ovarian failure (menopause), opioids, anorexia, underweight
Increased Progesterone: pregnancy, pregnenolone supplementation (increases urine progesterone metabolites, not actual circulating progesterone), Vitex (chaste tree berry)
Decreased Progesterone: hormonal birth control, stress, high insulin, opioids, NSAID use >10 days, anovulation, luteal phase defect, high prolactin, underweight, hypothyroid, hormonal IUD (Mirena)

Information on this chart is for educational purposes only and is not a suggestion for supplementation with any of the listed items. References available upon request.

Precision Analytical
3138 Rivergate Street #301C
McMinnville, OR 97218

Provider Notes

Patient reports no menstrual cycles

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. There are hyperlinks to these videos on the first page of a DUTCH Complete or in these comments (below). The videos can also be seen by going to www.DutchTest.com and visiting the video library. Comments in the report that are specific to the patient ARE IN ALL CAPS or may be **bold.** The other information is general information that we hope you will find useful in understanding the patient's results. Reference ranges updated 7/23/2015.

THE PATIENT HAS AT LEAST ONE CREATININE VALUE THAT IS VERY LOW. ALL TEST VALUES ARE DIVIDED BY CREATININE TO CORRECT FOR HYDRATION, BUT THIS RELATIONSHIP HAS LIMITS. AS CREATININE GETS TOO LOW, ACCURACY MAY BE SLIGHTLY COMPROMISED. THIS HAPPENS MOST COMMONLY WHEN THE PATIENT DOES NOT HEED THE INSTRUCTIONS AND CONSUMES EXCESSIVE FLUIDS DURING COLLECTION. IF THIS IS TRUE OF ONE OR TWO SAMPLES ONLY, CORTISOL AND CORTISONE MAY BE EFFECTED AT THE TIME OF THOSE SAMPLES. IF IT IS TRUE OF MOST OR ALL OF THE SAMPLES, ALL RESULTS MAY BE SOMEWHAT AFFECTED. FOR THIS REASON THE INSTRUCTIONS ADVISE PATIENTS TO AVOID EXCESSIVE FLUIDS LEADING UP TO AND AT THE TIME OF TESTING.
IF THE PATIENT IS ACTUALLY EXCRETING LESS CREATININE THAN THEY SHOULD (FOR A MEDICAL REASON) THIS WILL ALSO CAUSE THE ENTIRE HORMONE PANEL TO BE ELEVATED DUE TO THE OVERALL LOW CREATININE IN THE CALCULATION. OUR EXPERIENCE IS THAT MALE VALUES LESS THAN 0.2mg/mL AND FEMALE VALUES LESS THAN 0.15 MAY BE PROBLEMATIC FOR THE INDIVIDUAL VALUES FROM THOSE SPECIFIC SAMPLES WITH LOW CREATININE VALUES.

THE PATIENT REPORTED SIGNIFICANT FATIGUE IN THE AFTERNOON/EVENING, BUT NOT IN THE MORNING.

Progesterone Metabolism: The primary role of progesterone is to balance the strong effects of estrogen. Progesterone metabolites are measured and reflect progesterone levels well because very little progesterone is found in urine, so b-Pregnanediol is typically used a surrogate marker because it is the most abundant metabolite, but we also test the corresponding a-pregnanediol. The average of the two metabolites is reported for progesterone. If levels are in the lower part of the reference range compared to estrogen levels, symptoms of too much estrogen may occur
When ordering the DUTCH Complete, you will see Progesterone Serum Equivalent on the summary page 1. The urine metabolites of progesterone have been proven to correlate strongly enough to serum progesterone to provide this value. The correlation is the strongest for values within the premenopausal luteal range. Urine metabolites can at times result in somewhat higher serum equivalent results in the postmenopausal range. For this reason the postmenopausal Serum Equivalent range is slightly higher than typical serum ranges. NOTE: If progesterone is taken orally (also with sublingual), these metabolites are elevated from gut metabolism and results do NOT accurately reflect serum levels.

Androgen Metabolism: This group of hormones is typically thought of as “male” hormones, but they play a key role for women as well. Testosterone is made in the ovaries as well as the adrenal glands. In postmenopausal women, the adrenal glands are the primary source of testosterone. a-DHT (a-dihydrotestosterone) is the most potent androgen (3X more than testosterone), but it is primarily made within the liver and target cells (it is a paracrine hormone) and not by the gonads. a-DHT is subsequently deactivated to a-androstanediol within target tissues and then excreted. Only a fraction of a-DHT formed actually enters circulation as a-DHT (Toscano, 1987). The corresponding beta metabolites (for example b-DHT) are not androgenic. Looking at the balance of androsterone (alpha) and etiocholanolone offer the best approximation of how readily DHT will be made. Elevated androgens can cause general and sexual aggression, increased muscle mass, increased facial/body hair, reduction of fat deposition, and increased libido. Androgen deficiency can lead to decreased sexual function, vaginal dryness, fatigue, depression, and bone loss.

5a-Reductase Activity: The competing enzymes 5a and 5b-reductase act on the androgens androstenedione (creating androsterone and etiocholanolone located under the progesterone picture) and testosterone (creating a-DHT and b-DHT). They also metabolize progesterone, and cortisol. The alpha metabolites of androstenedione and testosterone are far more androgenic than their beta counterparts. Consequently, increased 5a-reductase activity may be accompanied by clinical signs of androgenicity (excess facial hair growth, scalp hair loss, acne, irritability, oily skin, prostate issues in men…etc). If the patient heavily favors the 5a pathway and there are concerns of excess androgenicity (or prostate cancer risk), this may be worth addressing.

Estrogen Metabolism: There are two primary issues with respect to estrogens. 1) Estrogen production (is the patient deficient, sufficient, or in excess?) and 2) Estrogen metabolism (is the metabolism of estrogen favorable or unfavorable when looking at the phase 1 hydroxylation and phase 2 methylation pathways?)

While estradiol (E2) is the most potent estrogen, levels of estrone (E1) and estriol (E3) should also be considered when evaluating the patient's estrogen production. It is important to compare the patient's distribution of metabolites from the pie chart (2nd pie chart) to "Normal Estrogen Metabolism" pie chart. If they are making considerably less of the protective 2-OH estrogens, consider something to improve this metabolism (DIM, I-3-C, etc). Be advised that increasing 2-OH metabolism will likely lower E1 and E2 as well which may not be warranted if E1 and E2 are already low. It is our position that the ratio of 2:16 OHE1 is not as relevant as has been thought historically (Obi, 2011). Providers may still wish to use this index and it can be calculated by simply dividing the two numbers. A female reference range for the ratio with our methodology is 2.4-6.0.

The methylation index will show you how effectively the patient is turning 2 and 4-OH estrogens into methoxy estrogens.

Methylation protects against potentially harmful 4-OH estrogens (carcinogenic) made in phase 1 detoxification. Supporting the methylation pathway should be considered if this index is low.

PHASE I METABOLISM LOOKS GOOD FOR THE PATIENT WITH A PREFERENCE FOR 2-OH METABOLISM. PRODUCTS TO INCREASE 2-OH METABOLISM MORE WOULD ONLY BE CONSIDERED IF E1 AND E2 ARE ELEVATED RELATIVE TO 2-OH ESTROGENS. PRODUCTS THAT PUSH FOR THE 2-OH PATHWAY ALSO LOWER E1 AND E2 LEVELS.

BECAUSE OF HOW LOW THE ESTROGEN LEVELS ARE, THE RATIOS USED TO CALCULATE THE METHYLATION INDEX AND THE HYDROXYLATION PERCENTAGES IN THE 2ND PIE CHART MAY BE LESS RELIABLE. THIS IS DUE TO THE FACT THAT AS HORMONE VALUES GET NEAR THE VERY LOW LIMITS OF THE TESTING ABILITY, THE ACTUAL VALUES BECOME LESS PRECISE THEREFORE THE CALCULATIONS ARE NOT AS CERTAIN AS WHEN THE ESTROGEN LEVELS ARE HIGHER.

DUTCH Adrenal: The HPA-Axis refers to the communication and interaction between the hypothalamus (H) and pituitary (P) in the brain down to the adrenal glands (A) that sit on top of your kidneys. When a physical or psychological stressor occurs, the hypothalamus tells the pituitary to make ACTH, a hormone. ACTH stimulates the adrenal glands to make the stress hormone, cortisol and to a lesser extent DHEA and DHEA-S. Normally, the HPA-axis production follows a daily pattern in which cortisol rises rather rapidly in the first 10-30 minutes after waking in order to help with energy, then gradually decreases throughout the day so that it is low at night for sleep. The cycle starts over the next morning. Abnormally high activity occurs in Cushing's Disease where the HPA-axis is hyper-stimulated causing cortisol to be elevated all day. The opposite is known as Addison's Disease, where cortisol is abnormally low because it is not made appropriately in response to ACTH's stimulation. These two conditions are somewhat rare. Examples of more common conditions related to less severely abnormal cortisol levels include fatigue, depression, insomnia, fibromyalgia, anxiety, inflammation and more.

Only a fraction of cortisol is "free" and bioactive. This fraction of cortisol is very important, but levels of metabolized cortisol best represents overall production of cortisol therefore both should be taken into account to correctly assess adrenal function.

The Daily Free Cortisol Pattern: In healthy adrenal function, cortisol levels are expected to rise in the early morning and fall throughout the day, reaching the lowest point around 1am and peaking 30-60min after waking. The waking sample represents the total of free cortisol throughout the sleeping period. Cortisone is the inactive form of cortisol. Its pattern is of secondary importance, but at times can give additional clarity and is provided on the adrenal page. Typical urine testing (24-hour collection) averages the daily production of cortisol. This approach is not able to properly characterize individuals whose cortisol patterns do not fit the typical rise then fall pattern through the day. Dysfunctional diurnal patters have been associated with health-related problems such as fatigue and insomnia.

The daily total of free cortisol is approximated by summing the four measurements. This calculated value correlates to a 24-hour free cortisol value. It is helpful to compare the relative level of 24-hr free cortisol with metabolized cortisol to understand HPA-axis activity. The total of free cortisol for the day only represents about 1-3% of the total production. The total of the metabolites is a better marker for overall cortisol production.

OVERALL FREE CORTISOL LEVELS ARE WITHIN RANGE, BUT METABOLIZED CORTISOL (THE BEST MARKER FOR OVERALL CORTISOL PRODUCTION) IS LOW. THIS IMPLIES THAT OVERALL HPA-AXIS A LOW. CORTISOL CLEARANCE MAY BE A BIT SLUGGISH, WHICH KEEPS FREE CORTISOL LEVELS WITHIN RANGE IN SPITE OF LOW OVERALL PRODUCTION. HYPOTHYROIDISM AND OTHER CONDITIONS MAY LEAD TO SLOW CORTISOL METABOLISM. IF TREATING THE PATIENT FOR POTENTIAL THYROID ISSUES BE SURE TO TAKE INTO ACCOUNT THE INTERPLAY BETWEEN THE THYROID AND ADRENALS. This free article shows excellent correlation between cortisol metabolism rates and thyroid levels (article was formerly available without charge, but only the abstract can be read without charge currently).

The Cortisol-Cortisone Balance: Cortisol, which is the active hormone, can convert into cortisone, the inactive form. They convert back and forth in different parts of the body. We tell which one you make more of by looking at whether cortisol metabolites (aTHF, bTHF) or coritsone metabolites (bTHE) are made more (compared to what is normal) in the gauge at the bottom of the adrenal page. The deactivation of cortisol to cortisone (via enzyme 11b-HSD II) occurs predominantly in the kidneys, colon, and saliva glands. The local formation of inactive cortisone from cortisol in the kidney is strongly reflected in urine. Activation of cortisone to cortisol takes place primarily in the liver, adipose tissue, gonads, brain, and muscle. Within these same tissues (mostly the liver) the free hormones are also converted to their metabolites (cortisol to a/b-THF, cortisone to THE). Balance between the two is usually preferred, but making more cortisol than cortisone is sometimes good to help give you enough cortisol if your levels are low however a preference for the active cortisol is enhanced by central adiposity, hypothyroidism, inflammation, and supplements such as licorice root extract. Cortisone formation is enhanced by growth hormone, estrogen, coffee and hyperthyroidism.

Reading the Report: The first page of the Dutch Complete lab report is a summary page while the second page of the Dutch Complete lab report and first page of the Dutch sex hormone and Dutch adrenal test are a classic lab report showing each result and the respective range of each hormone. Reference ranges shown are those of young healthy individuals with females collecting on days 19-21 (mid-luteal phase) of the menstrual cycle. The graphical representation of results on the page that follows allows the viewing of hormone results within the biochemical flowchart to more easily see the relative level of each hormone. The gauge format shows the patient result (represented by the "needle" of the gauge) and the area between the stars represents the reference range.
Reference ranges are typically set at the 20th to the 80th percentile of young, healthy individuals (DHEAS for example). This means that a result at the low end of a range is lower than 80 percent of young, healthy individuals. Likewise a result at the high end of a range is higher than 80 percent of the population. Some reference ranges are set more widely. For example, slightly elevated progesterone is not generally considered problematic, so its metabolites have reference ranges that extend

further (90th percentile instead of 80th).
The “fan” style gauges are used for indexes/ratios such as on 5a-reductase activity, cortisol/cortisone, and estrogen methylation. Because these values are all based on ratios there are no values or units, but they give a general idea of a particular relationship and can tell you how ‘turned up’ or ‘turned down’ a particular process is. The middle of the gauge represents an average value, while the lines towards the edge represent results lower or higher than most (80%) of the population. Being outside of any range is not always considered unfavorable. For example, on the estrogen methylation gauge, an elevated level means someone methylates estrogens very effectively which may have positive consequences.

What is actually measured in urine? In blood, most hormones are bound to binding poteins. A small fraction of the total hormone levels are "free" and unbound such that they are active hormones. These free hormones are not found readily in urine except for cortisol and cortisone (because they are much more water soluble than, for example, testosterone). As such, free cortisol and cortisone can be measured in urine and it is this measurement that nearly all urinary cortisol research is based upon. In the DUTCH Adrenal Profile the diurnal patterns of free cortisol and cortisone are measured by LC-MS/MS.

All other hormones measured (cortisol metabolites, DHEA, and all sex hormones) are excreted in urine predominately after the addition of a glucuronide or sulfate group (to increase water solubility for excretion). As an example, Tajic (Natural Sciences, 1968 publication) found that of the testosterone found in urine, 57-80% was testosterone-glucuronide, 14-42% was testosterone-sulfate, and negligible amounts (<1% for most) was free testosterone. The most likely source of free sex hormones in urine is from contamination from hormonal supplements. To eliminate this potential, we remove free hormones from conjugates (our testing can be used even if vaginal hormones have been given). The glucuronides and sulfates are then broken off of the parent hormones, and the measurement is made. These measurements reflect well the bioavailable amount of hormone in most cases as it is only the free, nonprotein-bound fraction in blood/tissue that is available for phase II metabolism (glucuronidation and sulfation) and subsequent urine excretion.
Disclaimer: the filter paper used for sample collection is designed for blood collection, so it is technically considered "research only" for urine collection. Its proper use for urine collection has been thoroughly validated.