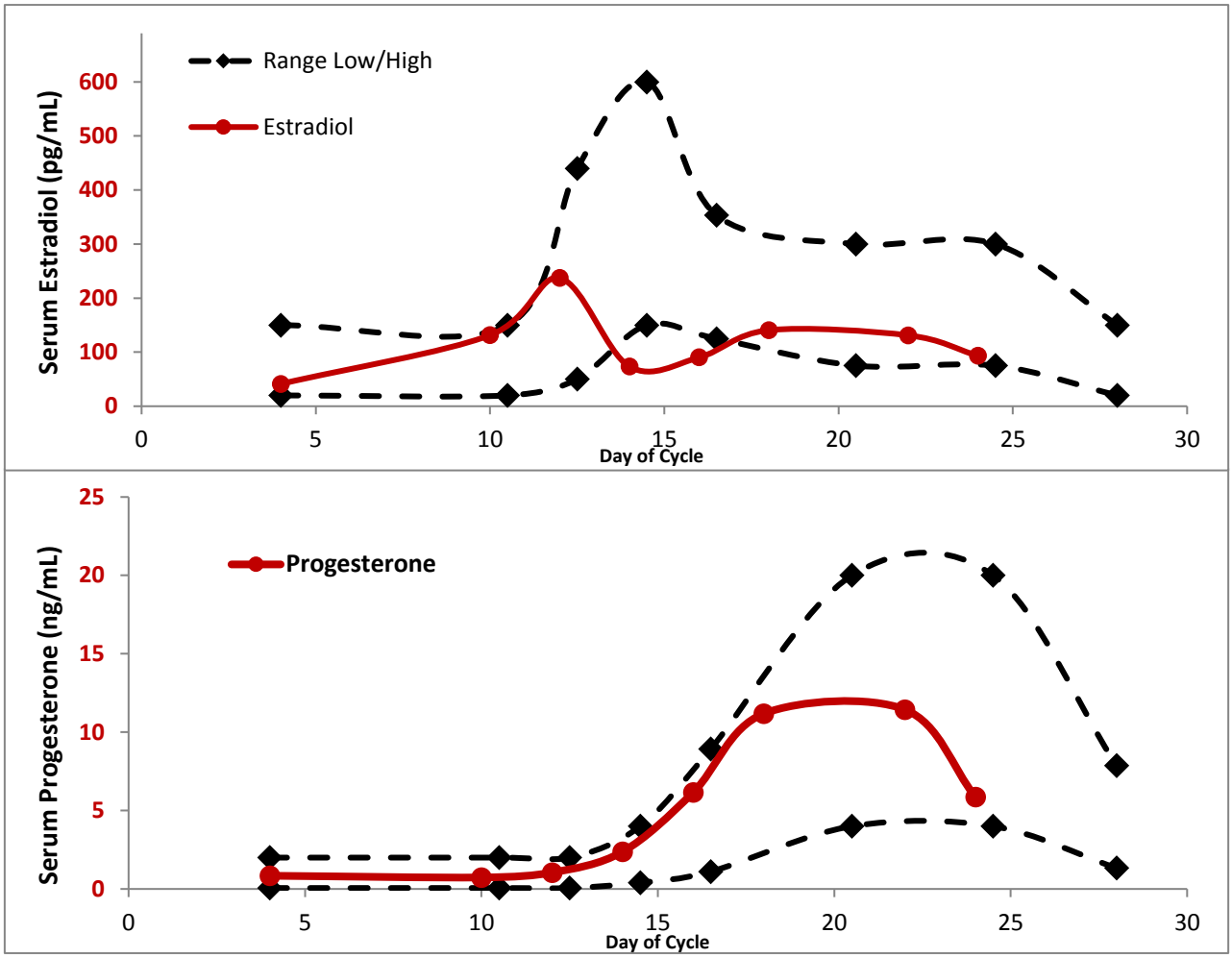
Accession # 209775	Name: Sample Patient	D.O.B. 12/30/1977
	Provider: Provider	Collection Dates 3/15-4/15/2015

DUTCH - Cycle Mapping

Monthly Pattern of Estradiol and Progesterone - Serum Equivalent

Values given on this page are based on research in which women's serum and urine metabolites were measured. Actual serum measurements were not made for this test.



Progesterone units = ng/mL

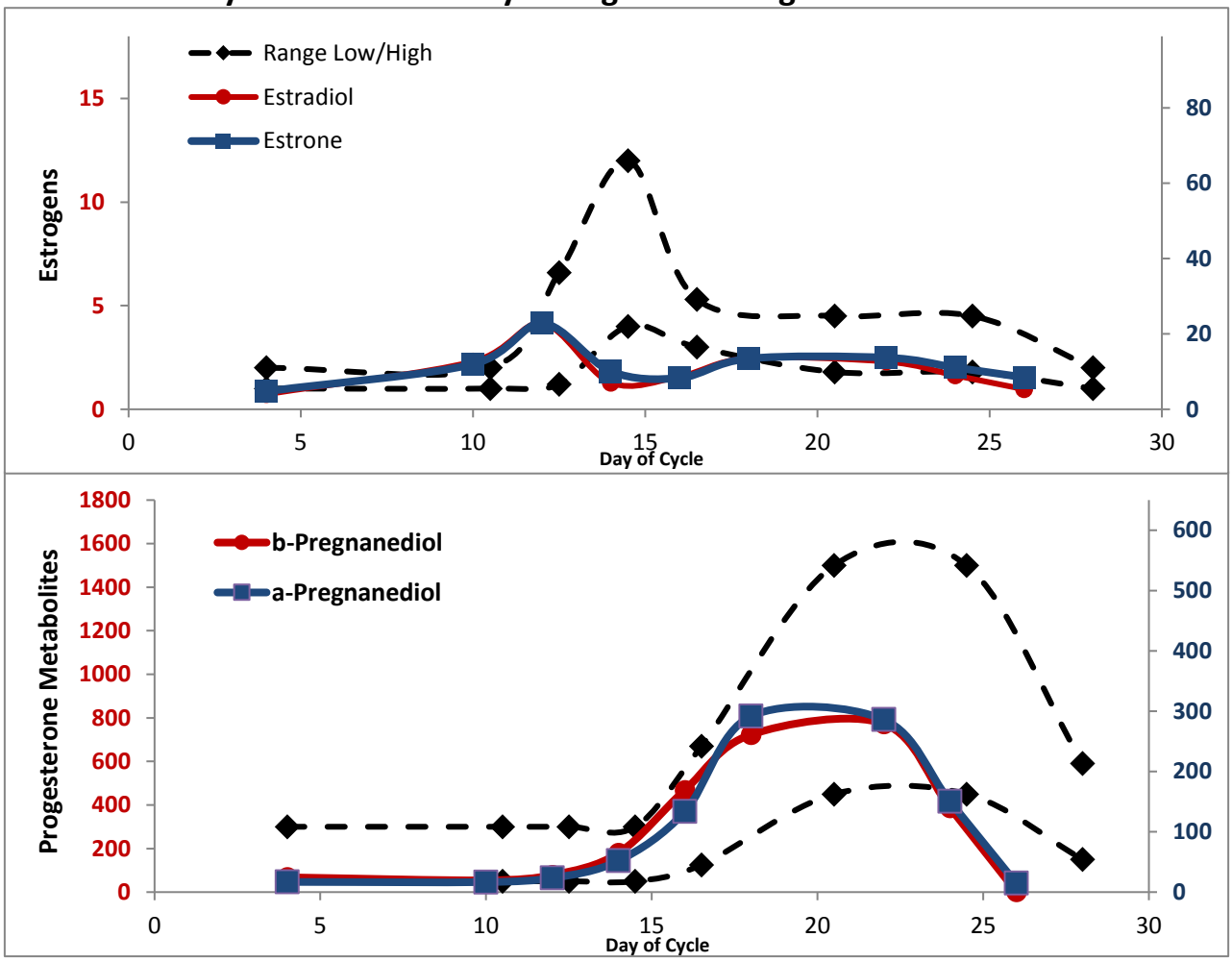
Measurement	1	2	3	4	5	6	7	8	9
Day of Cycle	4	10	12	14	16	18	22	24	26
Estradiol (pg/mL)	41.3	131.5	131.5	237.3	73.3	90.4	140.7	131.2	93.2
Progesterone	0.8	0.7	1.0	2.4	6.2	11.2	11.4	5.9	0.3
b-Pg / E2 Ratio	20	6	8	10	84	124	81	45	3

Normal Ranges	Follicular	Ovulatory	Luteal	Postmenopausal
Estradiol	1-2ng/mg	4-12ng/mg	1.8-4.5ng/mg	0.3-0.9ng/mg
Progesterone	10-100ng/mg	10-100ng/mg	120-500ng/mg	10-50ng/mg
b-Pg / E2 Ratio	50-300	<100	100-500	50-300

Accession #	209775	Name:	Sample Patient	D.O.B.	12/30/1977
		Provider:	Provider	Collection Dates	3/15-4/15/2015

DUTCH - Cycle Mapping

Monthly Pattern of Urinary Estrogen and Progesterone Metabolites



All values given in ng/mg creatinine

* Values from this sample also found on DUTCH Complete report

Measurement	1	2	3	4	5	6	7	8	9
Day of Cycle	4	10	12	14	16	18	22	24	26
Estradiol (E2)	0.7	2.3	4.2	1.3	1.6	2.5	2.3	1.6	1.0
Estrone (E1)	4.8	12.0	22.8	10.1	8.3	13.5	13.7	11.1	0.7
a-Progesterone	17	17	23	52	134	292	286	150	68
b-Progesterone	68	54	78	180	468	723	773	387	5
b-Pg / E2 Ratio	94	23	19	140	296	293	336	237	5

Normal Ranges	Follicular	Ovulatory	Luteal	Postmenopausal
Estradiol	1-2ng/mg	4-12ng/mg	1.8-4.5ng/mg	0.3-0.9ng/mg
Estrone	4-12ng/mg	22-68ng/mg	12-26ng/mg	3.0-9.0ng/mg
a-Progesterone	10-100ng/mg	10-100ng/mg	120-500ng/mg	10-50ng/mg
b-Progesterone	50-300ng/mg	50-300ng/mg	450-1400ng/mg	50-150ng/mg
b-Pg / E2 Ratio	50-300	<100	100-500	50-300

Measurements are made from individual samples, two-day sample averages and a four-day average* to give an optimized overview of the hormone patterns

Accession # 00216507
Female Sample Report
123 A Street
Sometown, CA 90266

Advanced Adrenal Assessment

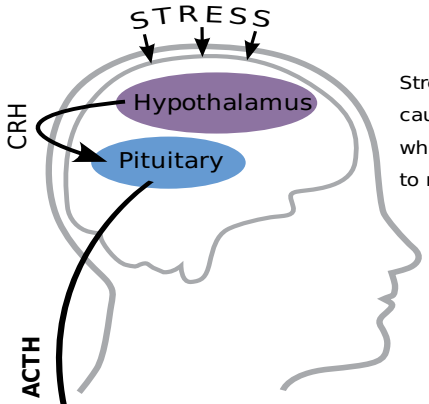
Last Menstrual Period:
2015-11-09

Ordering physician:
Dr. Dutch

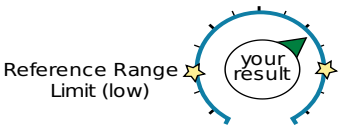
DOB: 1976-01-01
Age: 39
Gender: Female

Collection Times:
2015-11-10 04:00AM
2015-11-10 06:00AM
2015-11-10 03:00PM
2015-11-10 08:00PM

Category	Test		Result	Units	Normal Range
Creatinine					
	Creatinine A (Waking)	Within range	0.49	mg/ml	0.3 - 3
	Creatinine B (Morning)	Within range	0.33	mg/ml	0.3 - 3
	Creatinine C (Afternoon)	Within range	0.55	mg/ml	0.3 - 3
	Creatinine D (Night)	Within range	0.3	mg/ml	0.3 - 3
Daily Free Cortisol and Cortisone					
	Cortisol A (Waking)	Below range	4.0	ng/mg	10 - 36
	Cortisol B (Morning)	Below range	2.8	ng/mg	35 - 100
	Cortisol C (Afternoon)	Below range	3.7	ng/mg	12 - 27
	Cortisol D (Night)	Within range	3.0	ng/mg	0 - 15
	Cortisone A (Waking)	Below range	8.0	ng/mg	30 - 90
	Cortisone B (Morning)	Below range	6.4	ng/mg	80 - 185
	Cortisone C (Afternoon)	Below range	7.5	ng/mg	40 - 85
	Cortisone D (Night)	Low end of range	7.4	ng/mg	0 - 40
	24hr Free Cortisol	Below range	14.0	ug	80 - 180
	24hr Free Cortisone	Below range	29.0	ug	210 - 370
Cortisol Metabolites and DHEAS					
	b-Tetrahydrocortisol (b-THF)	Below range	346.0	ng/mg	750 - 1450
	a-Tetrahydrocortisol (a-THF)	Below range	41.0	ng/mg	90 - 320
	b-Tetrahydrocortisone (b-THE)	Below range	710.0	ng/mg	1300 - 2560
	Metabolized Cortisol (THF+THE)	Below range	1098.0	ng/mg	2240 - 4300
	DHEAS	Below range	18.0	ng/mg	23 - 350



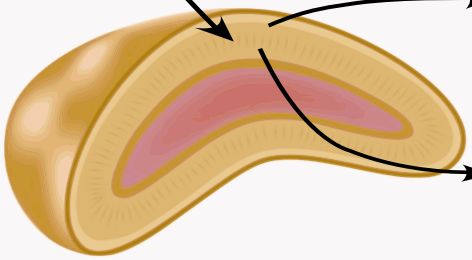
Stress (or inflammation) causes the brain to release ACTH, which stimulates the adrenal glands to make hormones



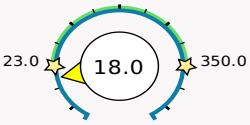
DHEAS Ranges

Age	Range
20-30	50-570
30-40	30-280
40-60	20-150
>60	15-115

Adrenal Gland



DHEA

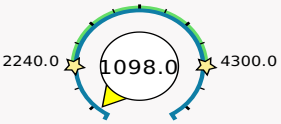


DHEAS

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

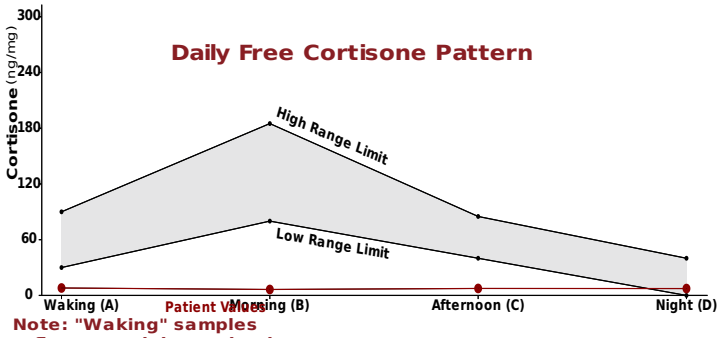
Cortisol

Cortisol Metabolism

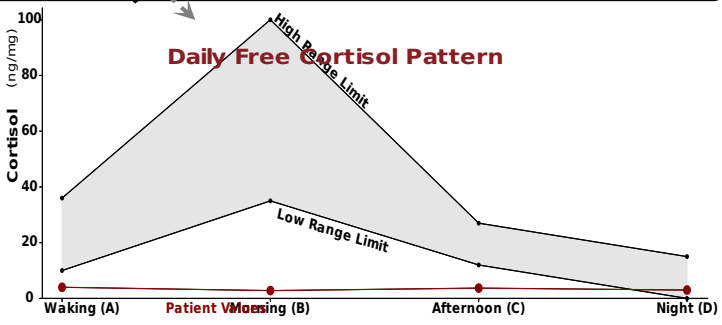


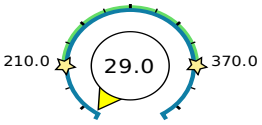
Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Circulating Free Cortisol



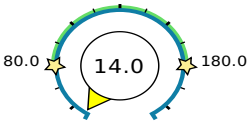
Note: "Waking" samples reflect overnight production





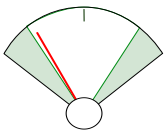
24hr Free Cortisone
(A+B+C+D)

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.

Provider Notes

Thank you for testing with us! If this is your first report, you are encouraged to skip to the last two paragraphs first under "Reading the Report" for an explanation of how to read the report and background information on urine hormone testing. Comments in the report that are specific to the patient ARE IN ALL CAPS. 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 following video link(s) may help those new to dutch testing to understand the results. If you only have a hardcopy of the results, the video names can be easily found in our video library at www.DutchTest.com. These results and videos are NOT intended to diagnose or treat specific disease states.

This video may assist with the interpretation of the Adrenal (coritsol) results: Cortisol tutorial video

THE PATIENT REPORTED SIGNIFICANT FATIGUE IN BOTH THE AM AND PM.

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 PATIENT NOTED TAKING A CORTICOSTEROID (ORAL, INJECTED, INHALED, INTRANASAL, OR TOPICAL). THIS LIKELY EXPLAINS THE VERY LOW PRODUCTION OF ENDOGENOUS CORTISOL AS CORTICOSTEROIDS SHUTS DOWN THE ADRENAL PRODUCTION OF HORMONES LIKE CORTISOL. THESE MEDICATIONS SHOULD NOT BE STOPPED SUDDENLY. IF THE PATIENT IS NOT TAKING A CORTICOSTEROID, CONSIDER ADDISON'S DISEASE TESTING.

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.

FREE CORTISOL LEVELS ARE LOW. LOW OVERALL HPA-AXIS ACTIVITY IS CONFIRMED BY LOW LEVELS OF METABOLIZED CORTISOL.

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.

THE PATIENT'S THF/THE RATIO IMPLIES A PREFERENCE FOR CORTISONE (RELATIVE TO CORTISOL). THIS MAY CONTRIBUTE TO THE PATIENT'S LOWER FREE CORTISOL LEVELS AND THEIR SYMPTOMS OF FATIGUE. ADRENAL SUPPORT THAT BLOCKS THE CONVERSION OF CORTISOL BACK TO ITS INACTIVE FORM (CORTISONE) MAY BE HELPFUL IN SOME CASES LIKE THIS DEPENDING ON THE OVERALL CLINICAL PICTURE.

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.