Adrenal Stress Profile (Saliva)

GENOVA DIAGNOSTICS EUROPE

46-50 Coombe Road
New Malden
Surrey KT3 4QF

63 Zillicoa Street
Asheville, NC 28801 USA

Patient:
DOB:
Sex: F
MRN:

Order Number:

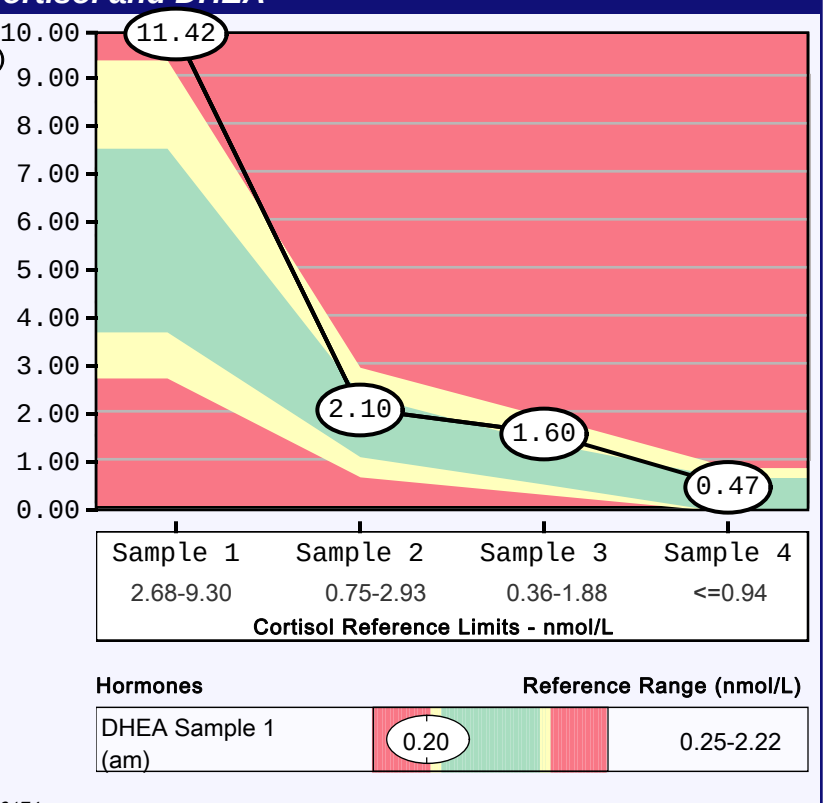
Completed:
Received:
Collected:

Ireland

Salivary Cortisol and DHEA

Cortisol Levels

			Reference Range (nmol/L)
Sample 1 Post Awakening	11.42	H	2.68-9.30
Sample 2 (+ 4 - 5 Hours)	2.10		0.75-2.93
Sample 3 (+ 4 - 5 Hours)	1.60		0.36-1.88
Sample 4 (Prior to Sleep)	0.47		<=0.94
Sum of Cortisol	15.590		



DHEA Level

DHEA : Cortisol Ratio	0.02	L	0.05-0.32

Testing performed by Genova Diagnostics, Inc. 63 Zillicoa St., Asheville, NC 28801-0174

Commentary

Please note the cortisol reference ranges have been updated due to a change in the assay manufacturer.

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Cortisol reference ranges are based on samples collected over one day during the following time periods (+/- 2hrs):
#1: 7AM - 9AM
#2: 11AM - 1PM
#3: 3PM - 5PM
#4: 10PM - 12PM

Results for samples collected outside the recommended time period should be interpreted with caution as the stated

Commentary

reference range may not apply.

For the patient:
This profile measures the levels of cortisol and DHEA and provides an evaluation of how cortisol levels differ throughout the day. Cortisol levels typically peak shortly after rising and are at their lowest after the onset of sleep. Cortisol is involved in many important functions in your body, including the metabolism and utilization of proteins, carbohydrates and fats, your body's response to physiological or psychological stress, and the control of inflammation and proper blood sugar levels. Cortisol also helps maintain proper blood pressure, normal nerve and brain activity and normal heart and immune function. DHEA also plays a role in the metabolism of protein, carbohydrates and fats, and works with cortisol to help maintain proper blood sugar levels. DHEA helps regulate body weight, blood pressure and immune function, and is used by the body to make the hormones, testosterone and estradiol. Too much or too little of cortisol or DHEA can lead to illness, and it is important that these two hormones be in balance with each other.

For the Physician:

In this profile, Sample 1 (Post awakening) cortisol level is significantly elevated. Because cortisol levels are typically at their peak shortly after awakening, morning cortisol may be a good indicator of peak adrenal gland function. High morning cortisol levels suggest a degree of adrenal hyperfunction in regard to peak circadian activity, stress being the most common inducer. High cortisol levels cannot be sustained and are often a precursor to adrenal fatigue. Other possible causes of high salivary cortisol include heavy exercise, pregnancy, hypoglycaemia, smoking, obesity, depression, alcoholism, and if significantly elevated, adrenal hyperplasia or Cushing's syndrome.

Sample 2 cortisol level is within the reference range. Mid-day cortisol levels may be a good indication of adaptive adrenal gland function since they represent the adrenal glands' response to the demands of the first few hours of the day. Mid-day cortisol levels within reference range suggest a component of normal adrenal function in regard to adaptive response.

Sample 3 cortisol level is within the reference range. Afternoon cortisol levels may be a good indication of the adrenal glands' ability to help regulate blood sugar, since they represent a postprandial sample. Afternoon levels within the reference range suggest normal adrenal function, especially in the area of glycaemic control.

Sample 4 cortisol level is within the reference range. Late-night cortisol levels may be a good indication of baseline adrenal gland function since they typically represent the lowest level during the day. Normal late-night cortisol levels suggest normal adrenal function with regard to baseline circadian activity.

DHEA is below the reference range. Decreased DHEA levels may be seen in thyroid disorders, cardiovascular disease, obesity, reduced immunity, rheumatologic diseases, and excess cortisol production, or with administration of pharmacological doses of glucocorticosteroids. Low DHEA levels are indicative of a lowered capacity to endure physiological or psychological stress/trauma/injury, and may present with abnormal immune response, with increased incidence of autoimmune disease.

A low DHEA: cortisol ratio is generally associated with chronic stress and hypothalamic-pituitary-adrenal imbalances. While often observed in individuals as they age, it may also be associated with cognitive and mood disorders, anxiety, and depressive symptoms. DHEA levels in women tend to decrease more rapidly with aging (especially between 50-60 years of age) than DHEA levels in men.

1-Day Progesterone / Oestradiol (Saliva)

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Analyte	Result		Units	Normal Range
Progesterone : Phase No Cycle				
Follicular Phase :	146		pg/mL	38-186
Peak :	146		pg/mL	103-436
Luteal Phase :	146		pg/mL	46-251
Post Menopause :	146		pg/mL	51-210
Oestradiol : Phase No Cycle				
Follicular Phase :	<0.68	L	pg/mL	0.76-2.40
Peak :	<0.68	L	pg/mL	1.23-5.20
Luteal Phase :	<0.68	L	pg/mL	0.76-2.23
Post Menopause :	<0.68	L	pg/mL	1.01-2.56
Progesterone / Oestrogen Balance				
Ratio : Follicular Phase Progesterone / Oestradiol:	NR		pg/mL	27-184
Luteal Phase Progesterone / Oestradiol:	NR		pg/mL	29-163
Post Menopause Progesterone / Oestradiol:	NR		pg/mL	38-134

Current Hormone Therapies: See Comments

Commentary

Within Normal Ranges

Outside Normal Ranges

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Testosterone (Saliva)

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63 Zillicoa Street
Asheville, NC 28801 USA

Patient:
DOB:
Sex: F
MRN:

Order Number:
Completed:
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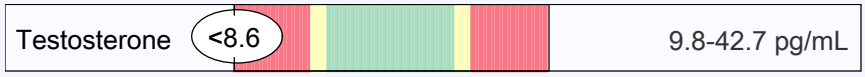
Collected:

Results & Ranges

			Analyte	Normal Range (pg/mL)
Testosterone	<8.6	L	Testosterone <8.6	9.8-42.7 pg/mL



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Suspect: Ovarian and Adrenal insufficiency. Consider the following options: Herbs: Siberian ginseng supports adrenal function. Stinging nettle increases testosterone levels. Chinese ginseng has androgenic activity.

Estrogen Metabolism Assessment (Urine)

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Methodology: LC-MS/MS; Results normalized to creatinine

Estrogens

Estrogens

		Reference Range
16α-Hydroxyestrone (16α-OH E1)*	1.6	0.5-8.9 mcg/g Creat.

*Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	0.5-8.9 mcg/g Creat.
Menopause	0.4-7.7 mcg/g Creat.
Male	<=2.0 mcg/g Creat.

		Reference Range
2-Hydroxyestrone + 2-Hydroxyestradiol [2-OH(E1+E2)] *	<dl	1.3-36.3 mcg/g Creat.

* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	1.3-36.3 mcg/g Creat.
Menopause	0.9-43.8 mcg/g Creat.
Male	0.7-12.5 mcg/g Creat.

		Reference Range
2-OH(E1+E2) / 16α-OHE1*	<dl	0.3-13.7

* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	0.3-13.7
Menopause	0.3-15.1
Male	0.8-12.9

		Reference Range
Creatinine ◆	33.36	27.00-248.00 mg/dL

Testing performed by Genova Diagnostics, Inc. 63 Zillicoa St., Asheville, NC 28801-0174

Lab Comments

The performance characteristics of all assays have been verified by Genova Diagnostics, Inc. Unless otherwise noted with ◆, the assay has not been cleared by the U.S. Food and Drug Administration.

<dl = Unable to calculate results due to less than detectable levels of analyte.

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Estrogen Metabolites

Estrogens are metabolized by two main pathways: (1) formation of the catechol estrogens 2-hydroxyestrone/estradiol (2-OHE1/E2) via the CYP1A1 pathway and 4-hydroxyestrone/estradiol (4-OHE1/E2) via the CYP1B1 pathway; and (2) formation of 16α-hydroxyestrone (16α-OHE1) via the CYP3A4 pathway.

2/16 Ratio and Hydroxylation pathways

2/16 Ratio - The clinical utility of the ratio of 2-hydroxyestrone (2-OHE1) to 16α-hydroxyestrone (16α-OHE1) – the 2/16 ratio or Estrogen Metabolite Ratio (EMR) – historically reported lower 2/16 ratio levels among breast cancer cases compared to controls (particularly in premenopausal women). Recent studies have been mixed: there appears to be no strong evidence in the literature that a higher urinary 2/16 ratio protects postmenopausal women from breast cancer, and only weak evidence of a protective effect in premenopausal women.

Higher 2-OH (E1+E2)/16α –OH ratios in males have been associated with reduced risk of prostate cancer.

2-OH (E1+E2) - While traditional 2/16 ratio clinical utility may not be as robust as previously thought, a majority of findings indicate that metabolism of parent estrogens through 2-hydroxylation (independent of any relationship to 16α-OHE1) may be considered as a benign or even protective pathway. (Of note: one study found increased breast cancer risk with higher 2-OH levels, but only in a small subgroup of ER-/PR- cases.)

Studies suggest that women with predominant metabolism through the 2-hydroxyl pathway have accelerated postmenopausal bone loss and lower BMD compared to those with predominant 16α-hydroxylation who appear to have reduced risk of bone loss. Increased 2- hydroxylation has been noted in women with a positive family history of osteoporosis suggesting that increased risk of osteoporosis in those with a family history may be related to inherited differences in estrogen metabolism.

16α-OH - Recent findings in the peer-reviewed literature are mixed, with some studies finding an association with increased risk (cancers of the cervix, breast, endometrium, and head and neck, as well as in people with tumors related to the human papilloma virus), but many finding no significant association.

Melatonin Profile (Saliva)

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63 Zillicoa Street
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Patient:
DOB:
Sex: F
MRN:

Order Number: d

Completed:
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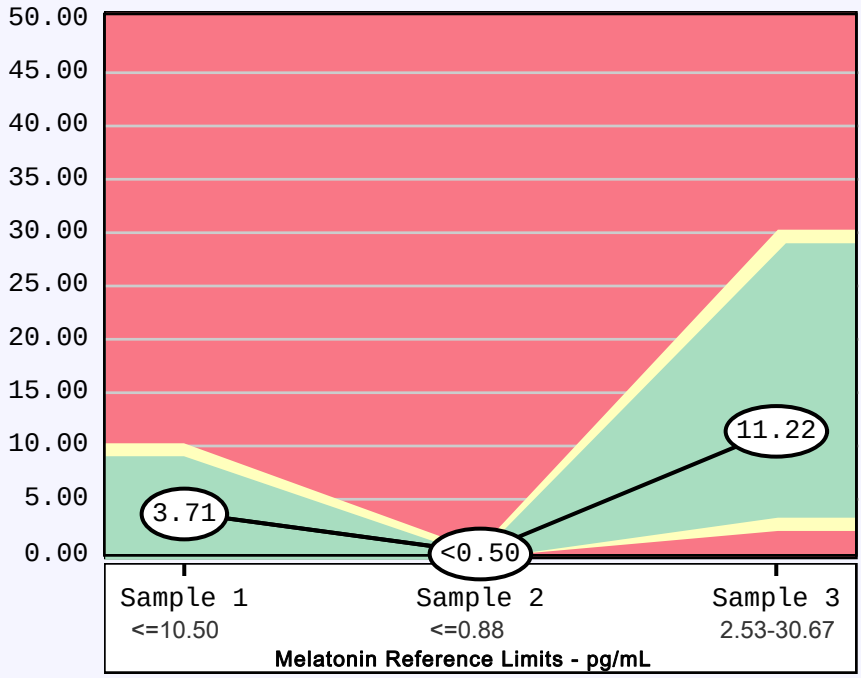
Collected:

Salivary Melatonin*

Melatonin Samples

		Reference Range (pg/mL)
Sample 1 Time: 07:00 AM - 09:00 AM	3.71	<=10.50
Sample 2 Time: 3:00 PM - 5:00 PM	<0.50	<=0.88
Sample 3 Time: 2:30 AM - 3:30 AM	11.22	2.53-30.67



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Commentary - General

Melatonin is the major hormone secreted by the pineal gland and is a key modulator of seasonal and circadian biorhythms. The synthesis and secretion of melatonin is controlled by a circadian clock in the hypothalamus and is synchronised by the light/dark cycle. The production of melatonin is inhibited by daylight and occurs during darkness. Melatonin is therefore inherently involved in the timing of functions such as sleep, mood, reproduction and immune system activity. Melatonin also not only acts as a hormone, but also as a potent antioxidant and is one of the most powerful scavengers of free radicals.

Commentary - Specific

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Melatonin activity is normal throughout the sample period revealing a normal melatonin circadian rhythm. As well as playing a crucial role in sleep-wake cycles, melatonin influences other vital functions, including cardiovascular and antioxidant protection, endocrine function, immune regulation and body temperature.