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Collection Date: July 11, 2009
Collection Time(s): 8:00 am
 12:40 pm
 7:30 pm
 10:00 pm
Sample Received: July 20, 2009
Reported On: July 28, 2009

SALIVA HORMONE TEST REPORT

Accession Number : 216481

Provider:
 Dr. Horace Mohn
 9090 Capital Hill
 Ottawa, ON K0L 0L0

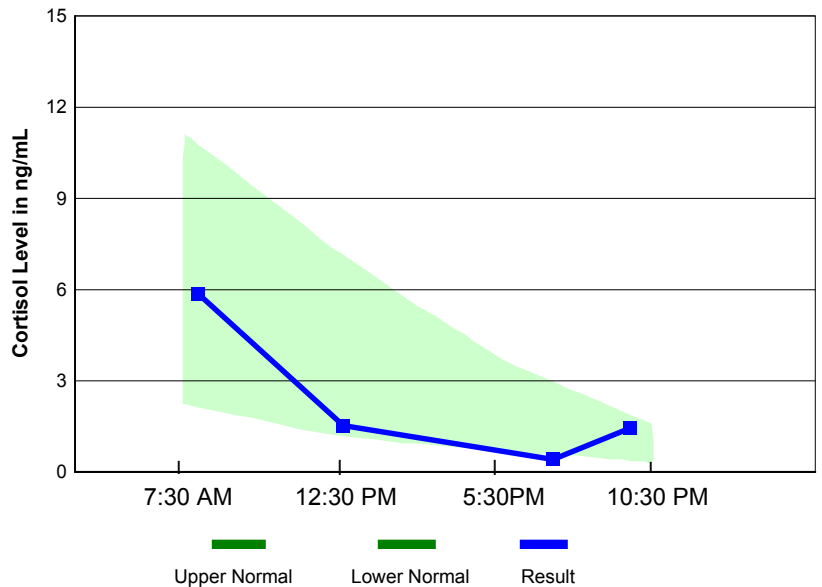
Client:
 Jane Dough
 1967 Centennial Ave
 Ottawa, ON K0L 0L0

Age: 40
DOB:
Gender: F
Status: Regular
Cycle Day: 22
Health #:

Phone:
 Fax:

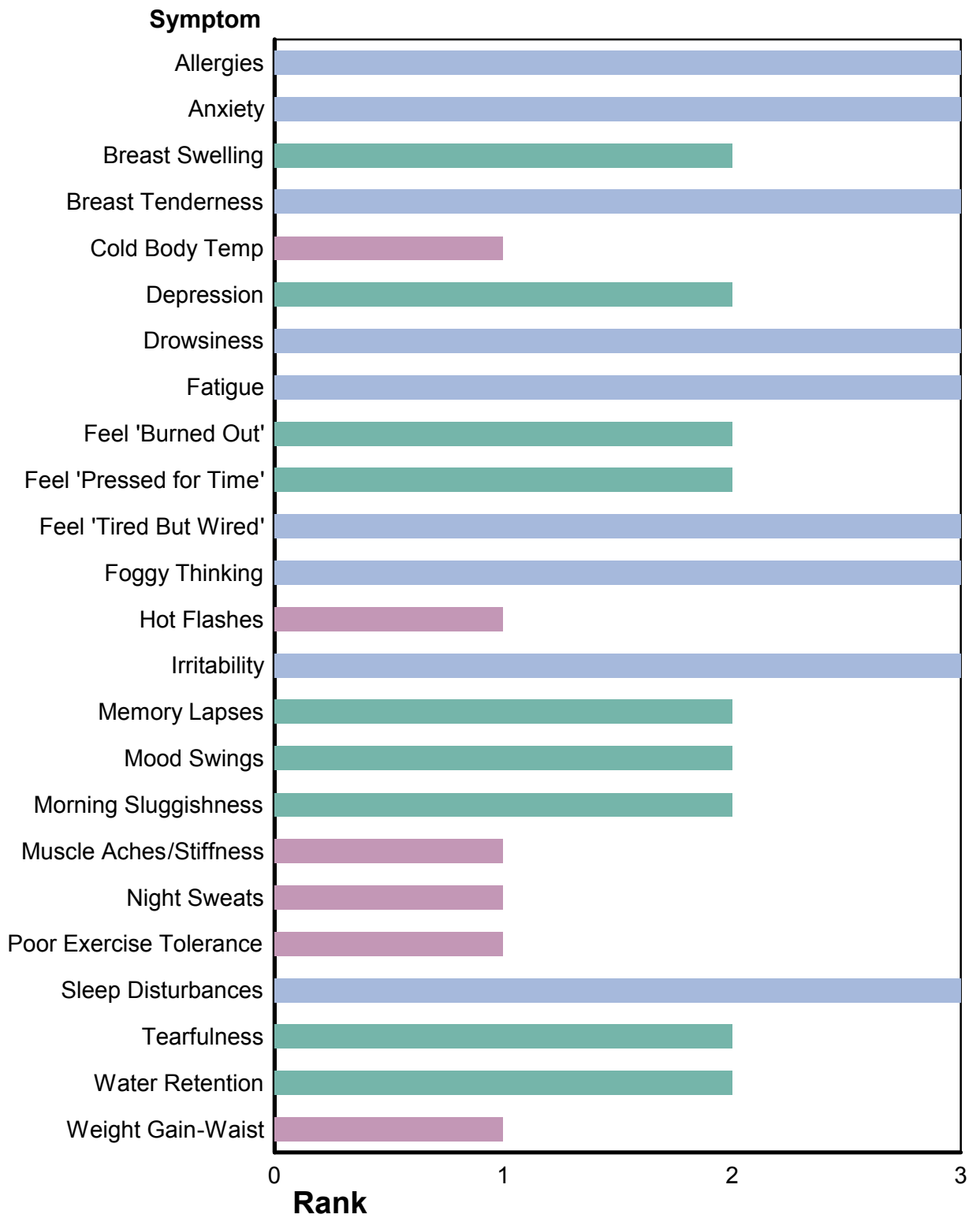
Hormone	Status	Result	Range	Units	Range Applied
Progesterone	Low end of range	66	50 - 250	pg/mL	Midluteal phase progesterone
DHEAS	Within range	< 1.0	3.0 - 11	ng/mL	Endogenous DHEAS 35-54 years
Cortisol AM	Within range	5.9	2.0 - 11	ng/mL	Sampled within 1 hour of waking
Cortisol Noon	Low end of range	1.5	1.0 - 7.0	ng/mL	Sampled at noon
Cortisol PM	Below range	0.41	0.50 - 3.5	ng/mL	Sampled prior to evening meal
Cortisol HS	Above range	1.4	0.20 - 1.3	ng/mL	Sampled at bedtime

Adrenal Function Graph



George Gillson
 George Gillson MD, PhD
 Medical Director

Co-Signing Physician:
 Clare Westmacott, MD
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Symptoms of hypothyroidism are present. These may include cold intolerance/feeling cold all the time, depression, weight gain, fatigue, headaches, thinning hair, and aching muscles, although not all these symptoms will be present in every individual. Other symptoms (not inventoried here) can include constipation, dry skin and muscle cramps. (Baiser W, Hertoghe J, Eeckhaut W. *J Nutritional Env Med* 2000;10:105-113.) Note that these symptoms may be present in the face of normal thyroid studies including TSH. This is known as a functional deficiency state in which the blood level of a hormone is normal, but the action of the hormone at the tissue level is being blocked by other hormone imbalances. For example, unopposed/insufficiently opposed estrogen replacement (especially oral estrogen) and excessive estrogen dosing are common causes of hypothyroid symptoms. High cortisol can oppose the action of T3 at the tissue level, whereas low cortisol can fail to potentiate the tissue action of T3, even if there is sufficient T3. Many individuals with low cortisol complain of hypothyroid symptoms. Note also that hypothyroid symptoms may persist despite supplementation with T4 (Synthroid, Eltroxin, L-throxine). In this situation, conversion of T4 to T3 (the more active form) may be blocked by high cortisol, heavy metal toxicity or deficiencies of nutrients including selenium, chromium and zinc. Note that some insight into hypothyroid symptoms in the face of normal serum thyroid testing might be had by assessing T3, T4 and selenium in a 24 hour urine specimen. For more information on this test, please contact the laboratory at 866 370 5227.

Strictly speaking, vasomotor symptoms including hot flashes and night sweats reflect sympathetic nervous system (SNS) instability. Hence these symptoms are dependent on many factors such as stress, brain chemical levels (T3, serotonin, norepinephrine, melatonin, GABA, progesterone, estradiol and cortisol), and HPA axis function. They are not "pure" symptoms of estrogen deficiency (Prior J. *Endocrine Rev* 1998;19:397-428), and in fact, these symptoms may co-exist with symptoms of estrogen dominance. Vasomotor symptoms can be seen with many different patterns of hormone imbalance, such as low progesterone, low testosterone, low or high DHEAS, high estradiol, high cortisol. (Note: A one year trial of progesterone cream demonstrated efficacy compared to placebo, for the control of vasomotor symptoms (Leonetti HB, Longo S, Anasti JN. *Transdermal progesterone cream for vasomotor symptoms and postmenopausal bone loss. Obstet Gynecol.* 1999 Aug;94(2):225-228.) Excessive use of progesterone (higher dose or unbroken daily usage) can also result in vasomotor symptoms by downregulation of estradiol receptors.

Low/low normal progesterone may result in diminished response to endogenous or supplemental estradiol, and may impair tissue action of thyroid hormone. Symptoms which can accompany low progesterone include breast tenderness, weight gain, fluid retention, vasomotor symptoms, poor sleep, decreased libido, irritability and anxiety. A one year, placebo-controlled, randomized trial has demonstrated that topical progesterone is effective for relief of vasomotor symptoms in early menopause. (Leonetti HB, Longo S, Anasti JN. *Transdermal progesterone cream for vasomotor symptoms and postmenopausal bone loss. Obstet Gynecol.* 1999 Aug;94(2):225-228)

An August 2007 analysis of the RMA database confirms that the adrenal contribution to circulating progesterone is less than or equal to approximately 50 pg/ml. For women in the luteal phase, the lower limit of progesterone expected in saliva has therefore been increased from 25 to 50 pg/ml. Women who have a progesterone level below 50 pg/ml in the luteal phase therefore have two issues: failure to produce ovarian progesterone, and suboptimal adrenal production of progesterone. Suboptimal adrenal progesterone output may also be accompanied by suboptimal levels of DHEAS and cortisol.

DHEAS is within the normal range for the patient's age, but this may not be an optimal level for this patient. Bear in mind that for reference, in healthy individuals less than 25 years of age, the normal range for DHEAS is 6 to 18 ng/ml for women, and slightly higher than this for men. Note that some women less than 35 years of age, whose DHEAS is toward the upper end of their normal range might have complaints such as oily skin or facial hair growth.

Noon cortisol divided by morning cortisol (C2/C1) is 0.26. In other words cortisol drops sharply from morning to noon; this may be indicative of a degree of dysregulation of adrenal function. In a study by Vedhara, noon salivary cortisol in individuals experiencing low stress was 58% of morning salivary cortisol, whereas in the high stress group, noon salivary cortisol was 39% of morning salivary cortisol. (Vedhara K, et al. Biol Psych 2003;62:89-96) A C2/C1 of less than or equal to 0.39 may be associated with increased perceived stress.

RMA database analysis (February 2008) indicates that a normal first morning cortisol sample has poor ability to predict cortisol levels throughout the rest of the day; a normal level first thing in the morning is not predictive of normal levels throughout the rest of the day. The morning point is, in a sense, "disconnected" from the rest of the day; symptoms tend to correlate much better to the noon, supertime and bedtime cortisol levels.

Here, at least two of the cortisol points are below normal and there are symptoms consistent with a degree of adrenal axis dysfunction. Fatigue (especially morning fatigue), anxiety, difficulty maintaining energy throughout the day, feeling flat or "burned out", excessive use of caffeine, hypoglycemic episodes, depression, allergies, and decreased exercise tolerance are some of the symptoms which can be indicative of adrenal dysregulation/adrenal fatigue, although not all these symptoms will be present in every individual. Low or low normal cortisol output may impair the action of thyroid hormone, and lead to functional hypothyroidism (symptoms of low thyroid such as feeling cold, depression, dry skin, constipation and weight gain, with normal thyroid tests). "Adrenal Fatigue: The 21st Century Stress Syndrome" by James Wilson DC ND PhD is an excellent reference on this topic. Ultimately, the treating physician is best able to determine the appropriate course of action.*

The ratio C/DHEAS is 1.00. This ratio normally increases with age. Based on a large in-house analysis of more than 15,000 samples at ZRT Laboratory in Portland, the ratio at age 20 is approximately 0.6; at age 45 it is 1.0; at age 60 it is 1.5 and at age 75 it is 2.3. This is because DHEAS declines with age whereas morning cortisol stays the same or increases slightly. If the ratio is higher than expected, based on the patient's age, this may be indicative of unbalanced adrenal function (cortisol too high or DHEAS too low). Factors which can contribute to imbalance include acute or chronic stress, obesity, metabolic syndrome/diabetes, and hypothyroidism. If the ratio is lower than expected for age, and DHEAS is within normal limits, this may simply be an indicator of healthy aging (i.e. preservation of DHEA output with age); however, a lower-than-expected ratio for age may also be due to low cortisol, high DHEAS, or both.



George Gillson MD, PhD
Medical Director

Note: The College of Physicians and Surgeons of Alberta considers saliva hormone testing and some forms of bio-identical hormone replacement to be complementary medicine. The interpretation comments have not been evaluated or approved by any regulatory body. Commentary is provided to clinicians for educational purposes and should not be interpreted as diagnostic or treatment recommendations. *General treatment suggestions can be found in the Rocky Mountain Analytical Resource Binder. Page 4 of 4