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Collection Date: 01-Mar-2015
Collection Time(s): 10:00 am
 2:35 pm
 6:30 pm
 10:15 pm
Sample Received: 05-Mar-2015
Reported On: 11-Mar-2015

Saliva Hormone Test

Accession Number : 444444

Provider:
 Healthy Me Clinic
 123 Any Street
 Downtown, ON L0L 0L0

Client:
 John Doe
 456 Noname Avenue
 Downtown, ON L0L 1L0

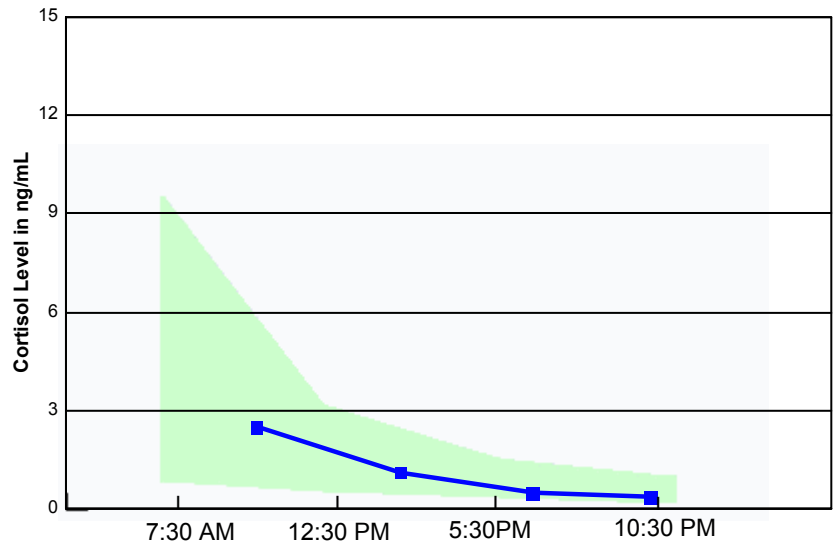
Age: 32
DOB: 01-Dec-1982
Gender: M

Phone:

Phone:
 Fax:

Hormone	Status	Result	Range	Units	Range Applied
DHEAS	Within range	4.4	3.0 - 11	ng/mL	Male DHEAS 25-34 years
Cortisol AM	Within range	2.5	0.90 - 9.5	ng/mL	Sampled within 1 hour of waking
Cortisol Noon	Within range	1.1	0.50 - 1.9	ng/mL	Sampled midafternoon
Cortisol PM	Low end of range	0.46	0.40 - 1.5	ng/mL	Sampled prior to evening meal
Cortisol HS	Low end of range	0.34	0.22 - 1.0	ng/mL	Sampled after 9 PM and before 1 AM

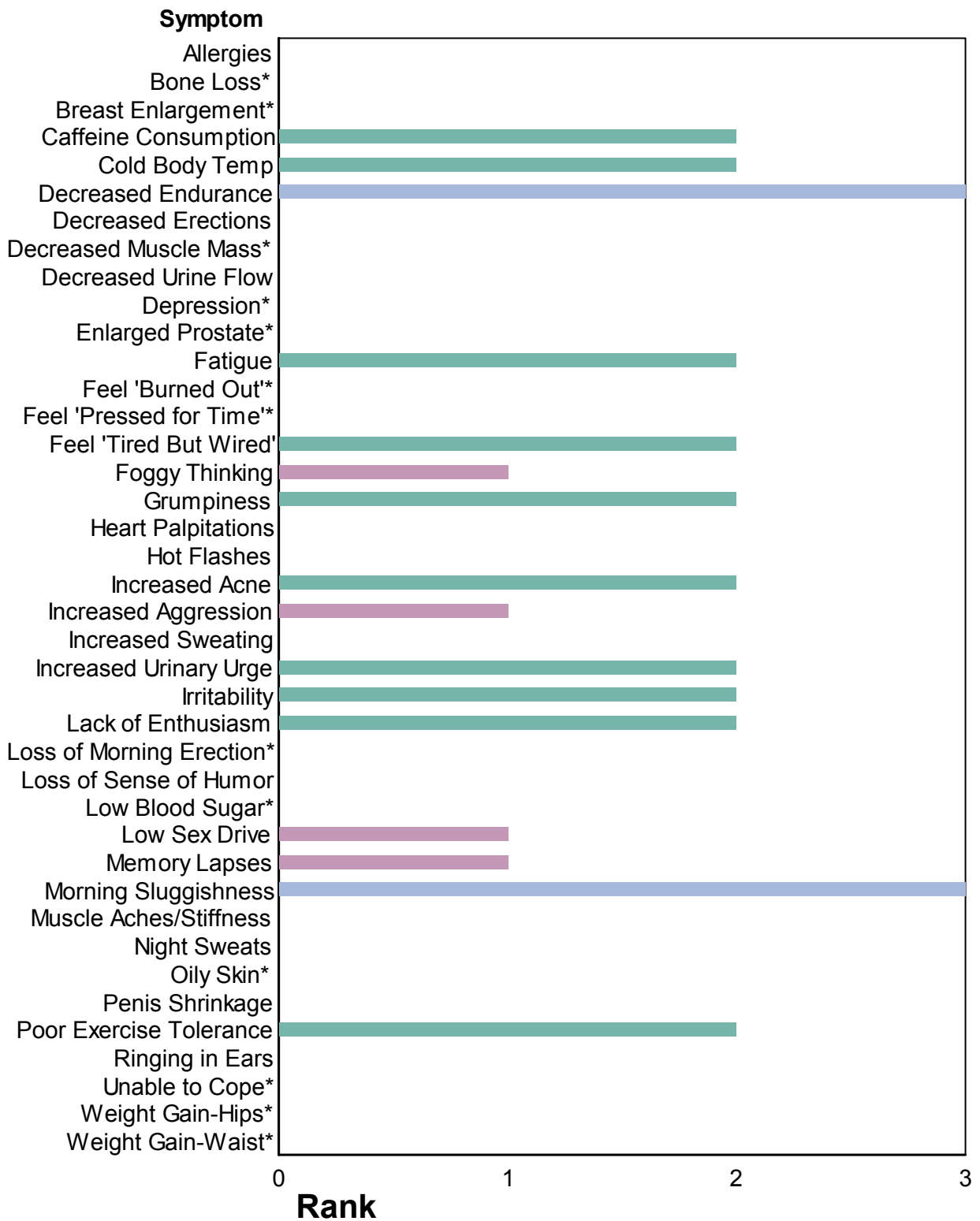
Adrenal Function Graph



Result Green shading represents normal range.

George Gillson
 George Gillson MD, PhD
 Medical Director

Co-Signing Physician:
 Clare Westmacott, MD
 Calgary, AB
 Phone (403) 278-1405



* Indicates symptom left blank.

CORTISOL RANGES HAVE CHANGED

Effective October 4, 2014, new reference ranges are in use. The main difference is that the ranges are tighter for noon, supper and bedtime cortisols. Note that the distribution of cortisol results at any time point in the day is not a "bell curve" or normal distribution. Cortisol is lognormally distributed. This means that the "middle" of the distribution at any time point during the day does not lie halfway between the lower and upper ends of the range. It lies closer to the low end of the range.

Note also that the ranges appearing on the report are the 5th and 95th percentiles. A "Below range" result lies below the 5th percentile, more than two standard deviations from the mean. A "Low end of range" result is between one and two standard deviations below the mean. A "Within range" result lies within one standard deviation above or below the mean. A "High end of range" result is between one and two standard deviations above the mean, and an "Above range" result is above the 95th percentile, more than two standard deviations above the mean.

It may be worthwhile measuring testosterone on this specimen. Symptoms of low bioavailable testosterone include fatigue, decreased sex drive, diminished quality of erections, deterioration in athletic performance, strength and endurance. Other symptoms include loss of self esteem, depression, irritability, loss of motivation and overall decreased enjoyment of life. (Tremblay R, Morales A. Canadian practice recommendations for screening, monitoring and treating men affected by andropause or partial androgen deficiency. *The Aging Male* 1998;1:213-218.) If you wish to measure testosterone on this sample, contact Rocky Mountain Analytical at (403) 241 4513 or (866) 370 5227. Samples are held for one month after being received at the laboratory.

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

It is still worthwhile measuring the morning point as a screen, because in contrast to a normal finding first thing in the morning, a low morning cortisol is usually predictive of low cortisols throughout the rest of the day. Also, the ratio of morning cortisol to morning DHEAS, C/DS, has been well characterized in saliva as a function of age, so it is sometimes helpful to compare the patient's ratio to age-appropriate norms.

Here, at least two of the cortisol points are low normal or 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.*

Here, the bedtime cortisol result is within 30% of the supertime result. This lends a flattened appearance to the latter half of the cortisol profile. This type of profile has been associated with fatigue in different patient populations. (Bower J et al. Diurnal cortisol rhythm and fatigue in breast cancer survivors. *Psychoneuroendocrinol* 2005;30:92-100.) Although there is a tendency on the part of some practitioners, to regard fatigue as a psychosomatic, or imaginary complaint, the association between fatigue and salivary cortisol output in the latter half of the day supports a real disturbance of the HPA axis in some settings.

Bedtime cortisol is low; if the patient is having difficulty sleeping, it might be related to low bedtime cortisol. There is some evidence that cortisol facilitates REM sleep. Addisonian patients who received hydrocortisone

(cortisol) at bedtime had more REM episodes and an increase in the percentage of time spent in REM sleep compared to placebo at bedtime (Garcia-Borreguero D et al. J Clin Endocrinol Metab 200;85:4201-4206).



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.