

Overview of #205 Adrenal Stress Profile, Plus V

The adrenal glands produce the complementary hormones cortisol and dehydroepiandrosterone (DHEA). The Functional Adrenal Profiles involve a series of saliva tests that measure the level of cortisol four times daily to establish its circadian rhythm. Additionally, this test measures a two-sample average of the sulfated form of DHEA (DHEA-S), and related metabolites including progesterone, estradiol, estriol, testosterone, and melatonin. Assessing the cortisol rhythm and DHEA-S average is a critical first step in new patient evaluation as well as a fundamental component in follow-up studies.

Physiology

Cortisol, which is best known for stimulating gluconeogenesis, is essential for normal glycogenolysis. Cortisol affects the heart, vasculature, blood pressure, water excretion, and electrolyte balance. It mobilizes protein stores in all tissues except the liver; it mobilizes fatty acids from adipose; it is the precursor of cortisone and acts as an anti-inflammatory; and it is the primary hormone directing immune function. Cortisol can stimulate or inhibit gene transcription, promote apoptosis, and affect bone metabolism and calcium dynamics. It affects behavior, mood, neural activity, and a variety of central nervous system biochemical processes. Cortisol affects the eyes, gastrointestinal tract, reproductive function, and the production and clearance of other classes of hormones. It is a major marker of the complex control loops regulating the sex hormones. The general effect of excess cortisol is usually stimulatory and catabolic; a deficiency of cortisol usually results in a slowing of physiology.

The salivary free fraction of the adrenal cortisol output is reported because of its high clinical correlation to accurately assess adrenal functions. To determine the cortisol circadian rhythm, the sum of four individual cortisol levels is taken at specified intervals throughout the day: in the morning between 6 and 8 a.m., between 12 and 1 p.m., in the late afternoon around 4 or 5 p.m., and at nighttime between 10 p.m. and 12 a.m.

In the presence of stressors, the body almost immediately attempts to increase cortisol levels. This increase is associated with both endocrine and autonomic responses in preparing the body to defend itself normally. However, elevated cortisol levels for extended periods negatively affect virtually every aspect of physiology. For example, it becomes more difficult to maintain proper blood sugar levels; to slow down for rest, recovery, and repair; to get good quality sleep; to balance other hormones; to maintain mucosal immune integrity; to maintain bone mass, to produce effective general immune function; to effectively regulate inflammatory processes; or to detoxify the body. Without proper intervention, continued high adrenal stimulation can lead to adrenal exhaustion and lowered cortisol levels. Eventually adrenal or cardiac failure can occur.

DHEA is the major precursor of testosterone and the estrogens. It becomes active at puberty. The more stable, sulfated form of DHEA is DHEA-S, which provides a more reliable measure of DHEA levels than DHEA itself. We report the average of two DHEA-

S values--the one taken between 12 and 1 p.m., and the other between 4 and 5 p.m. DHEA is an important modulator of many physiological processes. It promotes the growth and repair of protein tissue (especially muscle), and acts as a counter-regulatory agent to cortisol, negating many of the harmful effects of continued excess cortisol. When increased demand for cortisol is prolonged, DHEA levels decline. DHEA then is no longer able to balance the negative effects of excess cortisol. Depressed DHEA levels serve as an early warning of potential adrenal exhaustion.

A chronic imbalance between adrenal stimulation and cortisol and/or DHEA output is associated with a multitude of both clinical and subclinical systemic disorders, some of which are listed below. Chronically depressed DHEA output results in an imbalance in sex hormones. Abnormal cortisol and/or DHEA values (either elevated or depressed) result in a decrease in the activity of the immunocytes that produce secretory IgA (sIgA). SIgA provides a mucosal first-line immune defense against virtually every pathogen, including parasites, protozoa, yeasts, fungi, bacteria, and viruses. SIgA also provides a normal immune response to regularly encountered food proteins. Dysfunctional mucosal immunity is associated with an increased risk of infections and of adverse food reactions.

Clinical Use

The degree and timing of cortisol imbalances provides the healthcare professional with valuable insights into the nature of causative stressors, and allows the practitioner to formulate remedial protocols. Readily identifiable inducers of increased adrenal stimulation include stressors such as tissue damage, inflammation, pain, and mental or emotional stress. Other significant physiological stressors can be subclinical, and include intolerance to the gliadin fraction of gluten protein, lactose or sucrose intolerance, glycemic dysregulation, delayed food sensitivity, and the presence of parasites or pathogens. Additional testing may be necessary to rule out the possibility of these and other factors interfering with digestion and absorption. This type of problem could likely impede such fundamental and critical processes as the ability to absorb water, the assimilation of essential nutrients, and the maintenance of normal blood sugar. Chronic dysfunction of any of these processes is a sufficient cause of adrenal exhaustion. Physiological pathways, organs, or systems identified as being the major cause of some other disorder may concurrently serve as causative agents in adrenal exhaustion. In most cases, regardless of the priority given to another pathway, organ, or system as being dysfunctional--and virtually regardless of the condition identified--adrenal exhaustion resulting from excessive stress must be addressed and rectified in order to restore normal physiology or function.

Conditions Assessed

Conditions that may be assessed include adrenal malfunction, often misdiagnosed as thyroid malfunction, but that may include thyroid malfunction as well; systemic hyper- or hypo-excitability, whether of suspected neural or hormonal origin, including suspected thyroid, pancreatic, and sex hormone disorders; states of immunodeficiency; and states of

abnormal physiological response to any of a variety of stimuli including foods in the normal diet.

Logical Sequence of Testing

The logical sequence of using this test as an initial or as a follow-up test is determined by a variety of individual considerations, including the patient's chief complaint, the array of signs and symptoms, the chronicity of the condition, the tests previously taken, and the judgment of the practitioner. Technical assistance is available from Reed Davis , his support staff or directly from the lab.

Why Test Adrenal Function?

This profile is clinically indicated to evaluate an individual's ability to adapt to environmental, mental, emotional, and physiological stressors; to determine the efficacy of DHEA therapy; to assess rest and recovery relative to morning and bedtime Cortisol; and bedtime levels of Melatonin and Progesterone.

The Functional Adrenal Stress Profile plus V provides an adrenal rhythm and a DHEA-S -to-Cortisol ratio. Abnormal adrenal rhythm can negatively influence energy production; immune system health; skin regeneration; muscle and joint function; bone health; sleep quality; and liver, pancreas and thyroid function.

Adrenal dysfunction may be associated with the following symptoms: excessive fatigue; chronic stress and related health problems; dizziness upon standing; weakness; hypoglycemia; nervousness; irritability; depression; inability to concentrate; confusion; poor memory; low blood pressure; insomnia; premenstrual tension; sweet cravings; headaches; alcohol intolerance; excessive hunger; alternating diarrhea and constipation; sternocleidomastoid/trapezius pain and spasms; epigastric discomfort; poor resistance to infection; food and/or inhalant allergies; dyspepsia; tenderness in adrenal area; migraine headaches; low body temperature; and diminished sex drive.

Estrogens and Testosterone are included in this profile to further evaluate the efficacy of DHEA therapy. Since DHEA can convert to Estrogens and/or Testosterone, the use of DHEA may be contraindicated if Estrogens and/or Testosterone levels are elevated. Conversely, if Estrogens and/or Testosterone levels are depressed, DHEA and/or other therapeutic measures may be indicated. Bedtime Cortisol, Melatonin, and Progesterone levels are indicators for rest and recovery and are indicated for anyone with sleep disorders.

SUMMARY: Evaluating the Cortisol circadian (24-hour) rhythm along with DHEA-S provides an accurate assessment of adrenal function and can reveal maladaptation to stressors. Saliva (free fraction) testing determines the bioactive level of these hormones at the cellular level, thereby providing a functional assessment of the effects of environmental and physiological stressors.