**Why run Functional Adrenal Stress Profiles?**

Do you experience one or more of the following symptoms or conditions?

**Symptoms**

- **Exhaustion**
- **Alcohol Intolerance**
- **Anxiety**
- **Digestive Disorders**
- **Dry and Thin Skin**
- **Hair Loss**
- **Inability to Concentrate**
- **Fungal Infections**
- **Chronic illness**
- **Thyroid Disorders**
- **Low Body Temperature**
- **Pain in the Shoulders**
- **Poor memory**
- **Weakness**
- **Weight Gain/Loss**
- **Allergies**
- **Blood Sugar Imbalances**
- **Diminished Sex Drive**
- **Excessive Hunger**
- **Headaches**
- **Parasite Infections**
- **General Pain**
- **Irritability**
- **Pancreatic Disorders**
- **Mood Swings**
- **Low Back Pain**
- **PMS**
- **Difficulty Building Muscle**
- **Food Intolerances**
- **Sinus Problems**
- **Depression**
- **Dizziness upon Standing**
- **Craving for Sweets**
- **Immune Deficiency**
- **Bacterial Infections**
- **Inflammation**
- **Liver Disorders**
- **Low blood pressure**
- **Pain in the Neck**
- **Heart Palpitations**
- **Sleep Disorders**

If so, this is an indication that you may be suffering from adrenal insufficiency typically driven by one or more chronic stressors.

**Physiological Effects of the Primary Hormones of the Adrenal Cortex**

The adrenal hormones cortisol and DHEA have genetic influence on the body, they penetrate cells and enter the nucleus, where DNA is unlocked and transcribed. Cortisol is the main hormone that directs immune function and its levels are tremendously valuable in assessing overall health. Cortisol and DHEA are also involved in carbohydrate, protein and fat metabolism; eicosanoid modulation; detoxification capacity; endocrine function; and the health of muscle, bone and neural tissues, etc.

**Effects of Divergence from Normal Levels of Cortisol and DHEA**

Maintaining physiological balance is an important aspect of vibrant health, and nowhere is this more evident when it comes to cortisol. The production of too much cortisol can literally burn up the body, and insufficient cortisol production causes the body's internal machinery to malfunction, especially at the cellular level.

The adrenal glands produce both cortisol and DHEA in the adrenal cortex under the stimulation of adrenocorticotropic hormone (ACTH), which is released by the pituitary gland. ACTH acts like a whip on the adrenals. It is in many ways similar to a jockey whipping a horse to make it run faster. If the jockey ignores the clues that his horse is fatigued and keeps whipping it, the

horse will keep running until it collapses in total exhaustion or death. In the case of the human body, if we allow stress levels to become chronic and out of control, we can sooner or later expect the same result.

Optimal adrenal function exists when the ratio of cortisol to DHEA is in proper balance. This is why measuring this ratio is the best way to both evaluate adrenal function and determine the effects stress is having on overall health. When cortisol levels are elevated and DHEA is low we are considered to be in a Chronic Stress Response. When this happens we are losing (or have already lost) our ability to modulate bodily functions and are on the road to further hormone, immune, and metabolic breakdown.

For example, if cortisol levels are too high at night, rather than getting the rest and recovery necessary to maintain optimal physical repair and psychic regeneration, the body will be in a catabolic state (high nighttime cortisol levels inhibit the release of growth hormone necessary to repair and rebuild body tissues). This high cortisol will also have a negative effect on brain function, memory, learning and mood. This is especially true if this condition is ongoing (chronic in nature).

We all have noticed individuals who have excess fat around their hips, thighs or waist and yet they do not seem to be particularly overweight. In fact, these people may be slender except for those "problem" areas. More than making them uncomfortable wearing a bathing suit in public, this unsightly accumulation of fat is a telltale sign of adrenal dysfunction and hormone imbalance, specifically an elevated ratio of cortisol to DHEA.

An elevated cortisol to DHEA ratio will also interfere with the surface integrity of the body's mucosal linings that act as its first-line immune defense. This mucosal barrier is primarily under the direction of the adrenal glands, specifically cortisol and DHEA. Cortisol and DHEA systemically modulate the production and turnover of specialized immune cells called immunocytes that produce the secretory antibodies that protect us. The primary antibody of defense is secretory IgA (sIgA). When cortisol is elevated and DHEA is low, suppression of these mucosal immune cells occurs, compromising our first-line immune defense, resulting in low sIgA output.

The longer a person is in a state of chronic stress (high ratio of cortisol to DHEA), the more compromised his or her first line of immune defense will be and the greater the risk for opportunistic infections and allergic reactions to foods. This could ultimately lead to cancer, cardiovascular disease as well as autoimmune disease, a variety of degenerative diseases and accelerated aging.

In a Chronic Stress Response all body functions have become compromised due to prolonged hormone, immune and metabolic breakdown that can lead like falling dominoes to a cascade of chronic degenerative diseases from which the weakened body has a reduced chance to recover.

**Stages of Adrenal Exhaustion**

Adrenal exhaustion progresses in three stages. Stage I is distinguished by an increase in output of ACTH by the anterior pituitary gland, increased adrenocortical stimulation, increased cortisol output and an increased probability of pregnenolone steal and decreased DHEA. When in a Chronic Stress Response, pregnenolone, the common precursor to cortisol, DHEA and other hormones is preferentially diverted to cortisol production at the expense of the rest of the steroidal hormones (follow the small arrows on the chart). Generally in Stage I cortisol increases and DHEA and its metabolites decrease or an imbalance occurs especially between testosterone and estrogen.

Stage II Adrenal Exhaustion is marked by the transition from increased to decreased cortisol output. This stage is characterized by continuing high levels of ACTH and thus: adrenocortical stimulation, normal total cortisol output, low or borderline low morning, noon or afternoon cortisol levels, normal nighttime cortisol level, and an increased probability of pregnenolone steal and a further decrease in DHEA. This is a transitional phase in which although ACTH stimulation remains high or even increases, the adrenal output of cortisol declines due to the adrenal fatigue associated with continued hyper stimulation.

Stage III Adrenal Exhaustion is an advanced stage of adrenal exhaustion characterized by decreased total cortisol output. This stage is characterized by continuing high levels of ACTH and thus adrenocortical stimulation, low total cortisol output, and increased probability of a low nighttime cortisol level and pregnenolone steal and even further decrease in DHEA. The adrenal glands are now exhausted to the point that even though there is ongoing hyperstimulation (high ACTH); they continue to lose their capacity and reserve to produce enough cortisol. The eventual result is a crash of the hypothalamic-pituitary-adrenal axis (HPAA) in which essential neuroendocrine feedback loops are unable to return the system to homeostasis. (To understand more about the Stages of Adrenal Exhaustion refer to BioHealth Diagnostics' "Adrenal and Metabolic Interpretive Guide".)

**Testing Adrenal Function**

BioHealth Diagnostics' Functional Adrenal Stress Profile (BHD #201) and Functional Adrenal Stress Profile plus V (BHD #205) are tests that have been specifically developed to assess the level of your patients' adrenal function. Both the BHD #201 and BHD #205 assess the free fraction of the hormones that they measure; this is the biologically active portion of the hormone that does work at the cellular level. Since cortisol levels ideally fluctuate according to a daily circadian, peaking in the morning and decrementing to a low at bedtime only to rise again over night, four time-specific saliva samples are collected during a "normal" day (morning, noon, afternoon and nighttime).

On the BHD #201, four time-specific cortisol readings are reported along with a single average of two DHEA-S levels, one taken on the noon sample and one on the afternoon sample. The BHD #205 includes the levels on the #201 plus morning estradiol, estriol and testosterone as well as bedtime progesterone and melatonin.