Understanding Your Adrenal Stress Index Report

Prepared For: Sample Patient

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Please print this entire addition to your report and read it before your consultation. Starting on page 19 there is a short quiz that I will go going over with you during your consultation. Answer these questions. When you open this document in Adobe Acrobat, you may click on the red items to take you to a particular link.
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**INTRODUCTION - THE ADRENAL GLANDS**

**About This Guide**

This guide will explain your individual findings of the Adrenal Stress Index (ASI) test. You may have found the report to be quite technical and in fact it is. That's because it's a doctor's report. This addendum to your report should aid you to better understand it and most importantly what can be done to help you.

**What Are the Adrenal Glands?**

The adrenals are two small glands, each weighing 3 to 5 grams, that are located above the kidneys.

The adrenals have one of the highest rates of blood flow per gram of tissue, and the highest content of vitamin C per gram of any tissue in the body.

Each adrenal gland is composed of two separate functional entities. The outer zone, or cortex, accounts for 80% to 90% of the gland, and secretes adrenal steroids (cortisol, DHEA and aldosterone). Steroids are types of hormones. The inner zone, or medulla, comprises 10% to 20% of the gland, and secretes the catecholamines adrenaline and noradrenaline. Cortisol, DHEA and adrenaline are the three main adrenal stress hormones. *It is very important to note that the adrenal glands control metabolism in many different organs.*

**The Adrenal Rhythm and Its Importance**

The human adrenal gland does not secrete its steroid hormones at a constant level throughout the day. The hormones are actually released in a cycle with the highest value in the morning and the lowest value at night. This is easily understood by looking at the figure below. This 24-hour cycle is called the circadian rhythm.

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1. **steroid** - A group of structurally related hormones, based on the cholesterol molecule. They control sex and growth characteristics, are highly lipophilic (having an affinity for fat)
2. **cortisol** - a hormone synthesized in the adrenal glands. The amount of cortisol present in the serum (the liquid part of blood) undergoes diurnal (Diurnal means daily, especially pertaining to actions which are completed in 24 hours and are repeated every 24 hours). variation, with the highest levels present in the early morning, and lower levels in the evening, several hours after the onset of sleep.
3. **DHEA** - DHEA is a steroid produced by the adrenal glands and is the most abundant one found in humans. DHEA may be transformed into testosterone, estrogen or other steroids. It is found in the body as DHEA or in the sulfated form known as DHEA-S. One form is converted into the other as needed.
4. **aldosterone** - a hormone produced by the adrenal especially affecting mineral metabolism. It serves as the principal regulator of the salt and water balance of the body (a mineralocorticoid) and has a small effect on the metabolism of fats, carbohydrates, and proteins.
5. **hormones** - A chemical substance produced in the body that controls and regulates the activity of certain cells or organs. Many hormones are secreted by specialized glands such as the thyroid gland. Hormones are essential for every activity of daily living, including the processes of digestion, metabolism, growth, reproduction, and mood control.
6. **catecholamine** - A group of chemicals with active roles in the nervous system. This group includes adrenalin (also known as epinephrine), which is a hormone secreted by the adrenal gland, noradrenaline (also known as norepinephrine), and dopamine, a chemical in the brain that affects mood and appetite.
7. **metabolism** - the complete set of chemical reactions that occur in living cells. Cells are the individual unit in all organs and tissues of the human body.
Introduction to the Adrenal Glands

Functions Affected by Abnormal Adrenal Rhythm

An abnormal adrenal rhythm can influence many functions of the body, some of which are:

1. Energy production — Abnormal adrenal function can alter the ability of cells to produce energy for activities of daily living. People who have a hard time rising in the morning, or who suffer with a low energy level during the day, often have abnormal adrenal rhythms and poor blood sugar regulation.

   The maintenance of a stable blood sugar level depends on food choice, lifestyle, adrenal function and insulin activity. This panel measures stress hormones and insulin, to help ferret out causes of fatigue, cravings and obesity.

2. Muscle and joint function — Abnormal adrenal rhythms are known to compromise tissue healing. Reduced tissue repair and increased tissue breakdown can lead to muscle and joint breakdown with chronic pain.

3. Bone health — The adrenal rhythm determines how well we build bone. If the night cortisol level is elevated and the morning level is too high, our bones do not rebuild well, and we are more prone to the osteoporotic process. Stress is the enemy of the bones. In postmenopausal women, the effect of stress worsens due to the female hormone imbalances.

4. Immune health — Various immune cells (white blood cells) cycle in and out of the spleen and bone marrow for special conditioning, and possible nourishment and instructions. This immune system trafficking follows the cortisol cycle. So, if the cycle is disrupted, especially at night, then the immune system is adversely affected.

   Short and long-term stress is known to suppress the immune response on the surfaces of our body as in lungs, throat, urinary and intestinal tract. With the reduction in the surface antibody (called secretory IgA), the resistance to infection is reduced and allergic reactions are believed to increase.

5. Sleep quality — The ability to enter REM sleep cycles, i.e. regenerative sleep, is interrupted by high cortisol values at night and in the morning. Chronic lack of REM sleep can reduce the mental vitality and vigor of a person and induce depression.

6. Skin regeneration — Human skin regenerates mostly during the night. With higher night cortisol values, less skin regeneration takes place. So, a normal cortisol rhythm is essential for optimal skin health (See the figure below).

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hormones - chemical substances produced in the body that control and regulate the activity of certain cells or organs. Many hormones are secreted by specialized glands such as the thyroid gland. Hormones are essential for every activity of daily living, including the processes of digestion, metabolism, growth, reproduction, and mood control.
7. Thyroid’s function — The level of cortisol at the cell level controls thyroid hormone\(^9\) production. Quite often, hypothyroid symptoms such as fatigue and low body temperature are due to an adrenal maladaptation.

How do I know if I have a low functioning thyroid? There are several methods to evaluate thyroid function. The first is your basal body temperatures. This is the most accurate way to determine a low functioning thyroid. The second are thyroid blood tests. Even if thyroid blood tests are normal and your basal temperatures are low you have an under functioning thyroid. Blood tests DO NOT give the entire picture of a low functioning thyroid.

Other factors that can affect thyroid function include iodine deficiency and fluoride or bromine toxicity. All of the above factors can be tested.

8. Grain intolerance and Stress — About 12-18% of the U.S. population suffers from a genetic intolerance to grain. Specifically, a high incidence occurs in Celtic, Germanic, and Nordic populations. The gut becomes inflamed within 30 minutes after consuming the grains and this can lead to an adrenal stress response, increased cortisol and reduced DHEA.

**WHAT FACTORS AFFECT THE ADRENAL GLANDS?**

If you live on planet earth, you realize that stress is inevitable. Stress can be both a good and bad thing to the human psyche and body. A level of stress is required in everyday life in order to cope with the challenges. Stress responses in the human body originated in cavemen, when the body needed to source a quick supply of energy when faced with a dinosaur or other dangerous situation. Although the dinosaurs died out in the Ice Age, the human stress reaction did not. It is a matter of how your body *adapts* to stress and handles that stress that is key.

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9 thyroid gland - a small gland in the neck that makes and stores hormones that help regulate heart rate, blood pressure, body temperature, and the rate at which food is converted into energy.

10 hormone - a chemical substance produced in the body that controls and regulates the activity of certain cells or organs. Many hormones are secreted by specialized glands such as the thyroid gland. Hormones are essential for every activity of daily living, including the processes of digestion, metabolism, growth, reproduction, and mood control.
The human stress response is centred in the sympathetic nervous system, and includes the hypothalamus\textsuperscript{11} and the pituitary\textsuperscript{12} in the brain, and the adrenal glands. The stress response is also known as the “fight or flight response” because it readies the body to either attack the enemy or run away quickly from the dangerous situation.

**The General Adaptation Syndrome**

Hans Selye, a Canadian endocrinologist, coined the term “General Adaptation Syndrome”. He discovered and documented that stress differs from other physical responses in that stress is stressful whether one receives good or bad news, whether the impulse is positive or negative. He called negative stress “distress” and positive stress “eustress”. The system whereby the body copes with stress, the hypothalamic-pituitary-adrenal axis (HPA axis)\textsuperscript{13}, was also first described by Selye. He also pointed to an “alarm state”, a “resistance state”, and an “exhaustion state”, largely referring to glandular states.

\textsuperscript{11} hypothalamus - a structure in the brain important to the control of certain metabolic activities such as maintenance of water, sugar balance, fat metabolism, regulation of body temperature, and secretion of releasing and inhibiting hormones.

\textsuperscript{12} pituitary gland - the master gland of the endocrine system; located at the base of the brain which produces many hormones including FSH (follicle stimulating hormone) and LH (leutinizing hormone).

\textsuperscript{13} hypothalamic-pituitary-adrenal axis (HPA axis) - a complex set of direct influences and feedback interactions among the hypothalamus, the pituitary gland, and the adrenal glands. The interactions among these organs constitute the HPA axis, a major part of the neuroendocrine system that controls reactions to stress and regulates many body processes, including digestion, the immune system, mood and emotions, sexuality, and energy storage and expenditure.
THE THREE STAGES OF THE GENERAL ADAPTATION SYNDROME

Today’s stress is not quite as immediate life or death as it was in the caveman’s day; however long term stress can have significant impacts on the health of an individual. Stressors can be internal to the body or in the external environment and may be positive or negative.

For example, getting married is an incident of positive stress but if the relationship dies and divorce is the consequence, the stress of dealing with the divorce can be negative stress. Exercise and hard physical work can also put the body into stress.

When the body is in stress response mode, a three-stage process, known as the General Adaptation Syndrome, begins.

THE ALARM STAGE - FIGHT OR FLIGHT

The hypothalamus, adrenal and pituitary glands release additional hormones into the bloodstream in order for the body to be prepared for action. Breathing may become rapid and shallow, the liver releases additional glucose into the blood for energy and your heart rate may rise. The body can activate the alarm stage many times throughout the day in response to stressful situations. This is the “red light” phase. Unless there is constant on-going stress a person may not even be aware of any physical symptoms, however this same person may definitely complain about mental stress.

THE RESISTANCE STAGE - REACTING TO ONGOING STRESS

During resistance, the body is reacting to continued stress and the requirement to constantly prepare for action by being alarmed. In this stage of the General Adaptation Syndrome, the body is using great stores of energy, hormones, minerals and glucose. Although the body begins to try to adapt to the strains or demands of the environment, the body cannot keep this up indefinitely, so its resources are gradually depleted. Symptoms such as stomach problems, muscle pains, fatigue, headaches, insomnia, intestinal problems and eating issues may present.

THE EXHAUSTION PHASE - WEAKENING OF THE IMMUNE SYSTEM

This is the body’s response to continued long term stress. During the exhaustion stage, the body’s immune system may become weakened or there may be damage or disease such as ulcers, depression, diabetes, trouble with the digestive system or even cardiovascular problems, not to mention mental illnesses.

The initial reaction to a stressful situation is the flight or fight response; this allows...
the body to quickly release energy in order to run away or stand and fight. If a person is exposed to continual or ongoing stressful situations, the General Adaptation Syndrome will move through three stages, alarm, then resistance and finally, exhaustion. During exhaustion a person will definitely experience physical illness as the adrenals can no longer support themselves and the immune system breaks down.

Although stress is a neutral force, exposure to ongoing stressful situations can cause problems for the human body. The human stress response, which originated in cavemen and prepares the body for action, the flight or fight syndrome or alarm, is the first phase of the General Adaptation Syndrome. If the stressful situation continues, the body enters phase two of the General Adaptation Syndrome, resistance. During resistance the body cycles in and out of the alarm state using great amounts of energy. If the stress becomes chronic, the body enters into the final stage of the General Adaptation Syndrome, exhaustion where physical illness results.

» The longer a person has been in the exhaustion phase, the longer it takes to rehabilitate the adrenal glands. It is NOT uncommon to take 6 months to 2 years to totally rehabilitate the adrenal glands when long term exhaustion is present.

The Importance of Cortisol and DHEA

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.

During times of stress, cortisol levels increase and accelerate the breakdown of proteins to provide the fuel to maintain body functions. This catabolic activity needs to be balanced with periods of rebuilding to maintain good health. Under the influence of cortisol, the body can adapt to new stresses and survive until the physiological defense mechanisms are exhausted, or until the stress subsides. Selye, a pioneer in the study of the effects of stress on the body, termed this phenomenon the general adaptation syndrome. The ability to avoid multiple stress effects from mineral and water imbalances is due to adrenal steroid hormones. Animals can survive without adrenal glands if they are given small doses of adrenal hormones, but they are unable to adapt to any major chemical or physical stress, and cannot tolerate temperature extremes, starvation, infection, sensitizing agents or noxious chemicals.

What is a Normal Cortisol Level?

Cortisol should be the highest in the morning, peaking at approximately 8 a.m., followed by a gradual tapering off until about midnight, when circulating levels are at their lowest (see Figure 10.3). The episodic secretion of cortisol is caused by the intermittent transformation of cortisol from its precursors in the adrenal cortex under the influence of ACTH. This means that the brain is the primary site for control of the diurnal rhythm. Patients with adrenal insufficiency show the greatest depression of cortisol output in the morning, whereas abnormal output of cortisol seen with Cushing’s Syndrome is most prominent in the late evening. Morning levels may increase with increased psychosocial and environmen-
Introduction to the Adrenal Glands

tal stressors in those with sufficient adrenal function.

**Which Phase Am I In?**
This report will tell you how you are adapting to stress and which phase of the General Adaptation Syndrome you are in. Treatment recommendations including supplementation, diet and life-style modifications will also be discussed.

**The Adrenal Flow Sheet**

» The next page will be used during your consultation. Make sure you have printed it.
NORMAL CORTISOL CURVE

The following diagram shows the various pathways whereby hormones are produced. Also keep in mind that for the breakdown of cholesterol, a properly functioning liver and gallbladder is imperative. Hormone balance may therefore be affected by digestion.

Biosynthetic Pathway for Adrenal and Gonadal Hormones

What are the Effects of Abnormal Cortisol Levels?

<table>
<thead>
<tr>
<th>Deficiency</th>
<th>Excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic weakness</td>
<td>Sugar craving</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Central obesity</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Insulin resistance</td>
</tr>
<tr>
<td>Decreased stress tolerance</td>
<td>Weakness</td>
</tr>
<tr>
<td>Anorexia</td>
<td>Shakiness between meals</td>
</tr>
<tr>
<td>Alternating diarrhea</td>
<td>Irritability</td>
</tr>
<tr>
<td>and constipation</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Salt craving</td>
<td>Easy bruising</td>
</tr>
<tr>
<td>Postural dizziness</td>
<td>Amenorrhea</td>
</tr>
<tr>
<td>Muscle or joint pain</td>
<td>Impotence</td>
</tr>
<tr>
<td>Hyperpigmentation</td>
<td>Oily skin</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Sleep disturbances</td>
</tr>
<tr>
<td>Anemia</td>
<td>Headache</td>
</tr>
</tbody>
</table>

The area between the two curves is the normal range. When cortisol concentrations remain above normal during the afternoon and evening (arrows), deleterious affects of hypercortisolemia increase.
Your Adrenal Stress Index Lab Test Findings

**What You Need During Your Consultation**
If you have scheduled a consultation with your on-line doctor, make sure you have printed this entire report. He/she will be referring to specific sections of the report. You will also need to read the entire document to answer the questions in the “Test Your Understanding” section found on page 19.

**Your Abnormal Lab Findings**
The following abnormal results were noted in your test.

**Your Cortisol Levels are Abnormal**
One or more of your cortisol levels are above or below the normal range. (Keep in mind that the graphics displayed in this guide are NOT your values but are indicative of your values either being low, normal or high. Refer to your individual report for your values.)

Cortisol levels vary according to the level of stress and for how long that stress has been applied. Increasing cortisol production is the normal response to stress and is highly desirable, so long as the stress is removed and the adrenal glands can recover. On-going, unremitting stress means the adrenal gland and the whole body is in a constant state of alert, does not get time to recover and eventually packs up.
**WHAT STAGE AM I IN?**

By evaluating cortisol and DHEA levels, one can assess and define the relative function of the adrenal glands and arrive at treatment parameters. Use the following table to compare your cortisol and DHEA levels and what they mean. You may click on the links in this table for an explanation of each finding. Also, please note that you may have more than one finding present in this table.

<table>
<thead>
<tr>
<th>STAGE</th>
<th>CORTISOL LEVELS</th>
<th>DHEA LEVELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Normal Adrenal Function</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>2) Adrenal Overstimulation</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>3) Alarm Stage</td>
<td>High</td>
<td>Normal</td>
</tr>
<tr>
<td>4) Resistance Stage</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>5) Pre-Exhaustion Fatigue</td>
<td>Normal</td>
<td>Low</td>
</tr>
<tr>
<td>6) Normal Adrenal Function - Overuse of DHEA?</td>
<td>Normal</td>
<td>High</td>
</tr>
<tr>
<td>7) Excessive stimulation/secretion of both Cortisol &amp; DHEA</td>
<td>Low</td>
<td>Normal</td>
</tr>
<tr>
<td>8) Exhaustion Stage</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>9) Marginal HPA (Hypothalamic-Pituitary-Adrenal) performance</td>
<td>Low AM</td>
<td>Normal</td>
</tr>
<tr>
<td>10) Insomnia - Stress Response - Nocturnal Hypoglycemia - Chronic Pain</td>
<td>High AM</td>
<td>Normal</td>
</tr>
</tbody>
</table>

1. **Normal adrenal gland function — Normal levels of cortisol and DHEA** — Normal result. There may other supplements that are recommended based on the other lab values. In general this is an indication of proper adaptation to both chronic and acute stressors. In the context of a patient with very long-standing stressors (years) it can indicate either good coping/adaptation methods, or represent hormone levels “dropping through” normal ranges on the way to depleted levels after having been overstimulated (high cortisol, high DHEA) for many years.

2. **Adrenal Overstimulation — Raised cortisol, Raised DHEA** — This is the state of adrenal overstimulation. In most individuals after a continual period of imbalanced and unrelieved stressors (stressors>relaxers) adrenal levels begin to rise. Cortisol levels tends to rise more rapidly earlier than DHEA as it is a more immediate responder to stress. A search for persistent conscious and hidden or occult stressors with effective remediation is in order. *Chronic pain and illness, panic and anxiety disorders, childhood abuse or family dysfunction, food or environmental allergies, reactive hypoglycemia or glucose intolerance are amongst conditions to be considered*. If no major stressors can be identified, further adrenal analysis (urinary metanephrines, VMA, adrenal imaging) are indicated. If levels are excessively elevated, hormone secreting tumors as well as the patient’s or physicians use of exogenous adrenal hormones (prednisone, medrol, adrenal extract) should be investigated.

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1. metanephrines - the test is used to help diagnose or rule out a pheochromocytoma or other neuroendocrine tumor. The test should be ordered with symptoms of increased catecholamines release, such as persistent or episodic high blood pressure, severe headaches, rapid heart rate, and sweating.
2. VMA is one of the metabolites of the catecholamines epinephrine (adrenaline) and norepinephrine. Catecholamines are a group of similar hormones produced in the adrenal medulla, the central portion of the adrenal glands. Adrenal glands are small triangular organs located on top of each kidney. The primary catecholamines that they release are dopamine, epinephrine, and norepinephrine. These hormones are released into the bloodstream in response to physical or emotional stress. They help transmit nerve impulses in the brain, increase glucose and fatty acid release for energy, dilate bronchioles, and dilate the pupils. Norepinephrine also constricts blood vessels, increasing blood pressure, and epinephrine increases heart rate and metabolism. After completing their actions, the catecholamines are metabolized to inactive compounds. Dopamine becomes homovanillic acid (HVA), norepinephrine breaks down into normetanephrine and VMA, and epinephrine becomes metanephrine and VMA. Both the hormones and their metabolites are excreted in the urine. VMA is usually present in the urine in small fluctuating amounts that only increase appreciably during and shortly after the body is exposed to a stressor. Neuroblastomas, pheochromocytomas, and other neuroendocrine tumors, however, can produce large amounts of catecholamines, resulting in greatly increased concentrations of the hormones and their metabolites. The hormone releases can cause persistent hypertension, severe headaches, palpitations, sweating, nausea, anxiety, and tingling in the extremities.
3. **Alarm Stage — Raised cortisol, normal DHEA** — This indicates a normal short term response to stress. So long as the stress is removed, the adrenal gland will recover completely. The adrenal gland is functioning normally but the patient is acutely stressed. If cortisol levels are exceedingly high, adrenal tumors must be excluded. The use of exogenous steroids (cortisone, cortisol, DHEA, adrenal extract) or adrenal stimulants (caffeine, nicotine, cocaine, PCP) should be investigated.

4. **Resistance Stage — High levels of cortisol, low levels of DHEA** — This is a relatively rare scenario. The body cannot make enough DHEA to balance cortisol. This is the first sign of adrenal exhaustion and is a normal response to chronic stress. However, the patient needs a long break from whatever that chronic stress may be - insomnia, mental, physical or emotional overload, poor diet or whatever. Investigation into acute stressors (illness, trauma) is warranted, as are adrenal support protocols. One must also inquire about the use of adrenal supplements or exogenous corticosteroid use. Failure to correct leads to exhaustion. DHEA can be supplemented to make the patient feel better, but the underlying factors must be addressed, otherwise worsening can be expected.

   OR Cortisol levels low, DHEA borderline or normal — This probably represents the gland beginning to recover after a long rest. DHEA may be used to help patients feel better whilst they continue their program of rest and rehabilitation.

5. **Pre-Exhaustion Fatigue - Normal Cortisol, Low DHEA** — The body cannot balance chronic stressors or poor adaptation to intensive acute stressors. Stress analysis and adrenal support and restorative measures are exceedingly important. Recheck in one month is important.

6. **Normal Cortisol levels, high DHEA - Overuse of DHEA?** — This state can represent a variety of clinical scenarios; hence follow up monthly until a pattern is established would be indicated. These readings can be seen with excessive use of exogenous DHEA in the face of normal adrenal functioning. It can also reflect a more rapid fall in cortisol levels than DHEA after excessive adrenal stimulation has led to elevations of both DHEA and cortisol.

7. **Excessive stimulation/secretion of both Cortisol & DHEA — Cortisol levels low, DHEA levels normal** — This generally indicates falling levels of both cortisol and DHEA from excessive stimulation/secretion over long periods of time. It can also reflect the effects of exogenous use of DHEA in low cortisol, low DHEA states after several months of DHEA supplementation.

8. **Exhaustion Stage — Cortisol levels low, DHEA levels low** — The gland is so exhausted it can’t make cortisol or DHEA. Low cortisol with low DHEA suggests the adrenals are no longer able to compensate for chronic stressors and have moved toward adrenal exhaustion. By this time patients are usually severely fatigued and have immune system hypofunction. They may exhibit chronic anxiety. Other causes of low DHEA include the use of antidepressants, aging, elevated cortisol, insulin resistance and low serum growth hormone. If growth hormone deficiency is suspected, an IGF-1 Insulin Like Growth Factor blood test should be ordered. The exhaustion stage should not be confused with Addison’s disease, which is near absence of adrenal hormones, a complete adrenal failure, and a medical emergency. Untreated Addison’s disease inevitably results in death.

9. **Marginal HPA (Hypothalamic-Pituitary-Adrenal) performance — Low morning cortisol** — Depressed morning cortisol is suggestive of marginal HPA (Hypothalamic-Pituitary-Adrenal) performance. Normal rhythms exhibit highest cortisol value for the day at 7 - 8 AM. This finding is not specific for the alarm, resistance or exhaustion phase.

10. **Insomnia - Stress Response - Nocturnal Hypoglycemia - Chronic Pain - Overt/Hidden Inflammation — Elevated morning or night time cortisol OR Elevated noon/afternoon free cortisol.**

### Supplement and Dietary Recommendations for Abnormal Cortisol and DHEA Levels

Refer to your Treatment and Supplement Summary in your online program for your specific supplement and dietary recommendations.
**Your Adrenal Stress Index Lab Test Findings**

**Your DHEA Level is Low**

(Keep in mind that the graphics displayed in this guide are NOT your values but are indicative of your values either being low, normal or high. Refer to your individual report for your values.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHEA</td>
<td>Dehydroepiandrosterone</td>
<td>3</td>
<td>Adults (M/F): 3-10 ng/ml</td>
</tr>
<tr>
<td>Pooled Value</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DHEA, (chemical name Dehydroepiandrosterone), is a steroid produced by the adrenal glands and is the most abundant one found in humans. DHEA may be transformed into testosterone, estrogen or other steroids. It is found in the body as DHEA or in the sulfated form known as DHEA-S. One form is converted into the other as needed.

Low levels of DHEA-S may be due to adrenal dysfunction or hypopituitarism - a condition that causes decreased levels of the pituitary hormones that regulate the production and secretion of adrenal hormones.

DHEA is mildly androgenic. A precursor to other adrenal hormones, it diminishes with age and promotes longevity in animals. It is one of the best biochemical bio-markers of chronological age. DHEA has demonstrated protective effects for various cancers and is often effective for age-related issues such as sharper memory, enhanced immune function, energy, smooth skin, tired muscles, cardiovascular health, accelerated weight loss, and it may increase HDL.

The decline in DHEA levels appears to be a factor in age-related bone loss. In one important study, bone mineral density was measured at the lumbar spine, hip, and radius in 105 women, aged 45-69. Fifty women had normal measurements, whereas 55 had low bone density. The average serum DHEA-S level was 60% lower in the women with low bone density than in those with normal bones. **Women with low DHEA values were 40 times more likely to have osteoporosis than were women with normal DHEA levels. In contrast, there was no relationship between estrogen levels and bone density.** [Szathmari, M, et al. Osteoporosis Int 1994:4: pp.84-88]

**Supplement and Dietary Recommendations for Low DHEA**

Possible supplementation with DHEA is indicated. and will be discussed with you during your consultation. DHEA can be taken as 2.5, 5.0 and 10 mg tablets. The time you take DHEA is also very important. Refer to your Treatment and Supplement Summary in your online program for your specific supplement and dietary recommendations.

**Your Fasting Insulin is High**

(Keep in mind that the graphics displayed in this guide are NOT your values but are indicative of your values either being low, normal or high. Refer to your individual report for your values.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISN</td>
<td>Insulin Fasting</td>
<td>31</td>
<td>Normal: 3-12 uIU/mL</td>
</tr>
</tbody>
</table>

Hyperinsulinism refers to an above normal level of insulin. High fasting insulin is a sign of insulin resistance and the start of type II diabetes or Syndrome X, also known as Metabolic Syndrome, metabolic syndrome X, insulin resistance syndrome, Reaven's syndrome, and CHAOS. In addition to being a risk factor for type 2 diabetes, hyperinsulinism due to insulin resistance may increase blood pressure and contribute to hypertension by direct action on vascular endothelial cells (the cells lining blood vessels). Hyperinsulinism has also been implicated as a contributing factor in the excessive produc-
tion of androgens in poly cystic ovary syndrome.

The most common cause of increased insulin is obesity. Blood insulin is also frequently increased with Cushing’s Syndrome, women on oral contraceptives, hyperthyroidism, patients on exogenous cortical steroids or levodopa, non-insulin dependant diabetes, polycystic ovary disease (POD), essential hypertension, benign neoplasm of the pancreas, Metabolic Syndrome/Syndrome-X and with pituitary hyperfunction.

Symptoms and features of Syndrome X include: impaired fasting glucose levels, high blood pressure, central obesity (also known as visceral, male-pattern or apple-shaped adiposity), overweight with fat deposits mainly around the waist; a decreased HDL cholesterol and elevated triglycerides.

Supplement and Dietary Recommendations for High Fasting Insulin
Diet is critical in controlling insulin levels. You will need to follow a low glycemic diet in order to control your high insulin levels. If the levels do not decrease you may need medications to control the high insulin levels.

Refer to your Treatment and Supplement Summary in your online program for your specific supplement and dietary recommendations.

Your 17-OH Progesterone is Low
(Keep in mind that the graphics displayed in this guide are NOT your values but are indicative of your values either being low, normal or high. Refer to your individual report for your values.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>P17-OH 17-OH Progesterone</td>
<td>&lt;15</td>
<td>Depressed</td>
<td>Adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Optimal: 22-100 pg/ml</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Borderline: 101-130 pg/ml</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Elevated: &gt;130 pg/ml</td>
</tr>
</tbody>
</table>

17-Hydroxypregnenolone (also know as 17-OH progesterone or 17OHP), is a steroid hormones and is primarily produced in the adrenal glands and to some degree in the gonads (ovaries and testicles), specifically the corpus luteum of the ovary.

If you refer to the diagram Biosynthetic Pathway for Adrenal and Gonadal Hormones above, you will note that pregnenolone is a precursor to both progesterone, 17-OH Progesterone and cortisol.

Supplement and Dietary Recommendations for Low 17-OH Progesterone
We will consider the use of Pregnenolone, an important precursor in the production of cortisol and other steroids to replenish adrenal reserves in anticipation of adrenal output recovery. Refer to your Treatment and Supplement Summary in your online program for your specific supplement and dietary recommendations.
YOUR ADRENAL STRESS INDEX LAB TEST FINDINGS

YOUR TOTAL SALIVARY SIGA IS LOW
(Keep in mind that the graphics displayed in this guide are NOT your values but are indicative of your values either being low, normal or high. Refer to your individual report for your values.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB2S</td>
<td>Total Salivary SIGA</td>
<td>7</td>
<td>Depressed Normal: 25-60 mg/dl</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Borderline: 20-25 mg/dl</td>
</tr>
</tbody>
</table>

**WHAT IS SALIVARY SIGA AND WHY IS IT IMPORTANT?**
1. Secretory IgA (SIgA) is secreted by the various mucosal surfaces. Because it is resistant to degradation by enzymes, secretory IgA can survive in harsh environments such as the digestive and respiratory tracts, to provide protection against microbes that multiply in body secretions.
2. The main functions of SIgA include immune exclusion (the prevention of an antigen from entering the body by a specific immune response), viral and toxin neutralization, plasmid elimination (plasmids contain DNA that replicate within a cell and are most often found in bacteria), and inhibition of bacterial growth. Secretory IgA (sIgA) forms an immune barrier to protect against gastrointestinal tract infections.
3. Production of SIgA is adversely affected by stress which is mediated by increased cortisol and/or catecholamine levels.

Reduced physical activity and excess body fat in children have also been demonstrated to result in decreased levels of sIgA and increased incidence of upper respiratory infection.

**SUPPLEMENT AND DIETARY RECOMMENDATIONS FOR LOW SIGA**
Refer to your Treatment and Supplement Summary in your online program for your specific supplement and dietary recommendations.

YOUR GLIADIN AB, SIGA IS HIGH
(Keep in mind that the graphics displayed in this guide are NOT your values but are indicative of your values either being low, normal or high. Refer to your individual report for your values.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>FI1</td>
<td>Gliadin Ab, SIGA (Saliva)</td>
<td>36</td>
<td>Positive Borderline: 13-15 U/ml</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positive: &gt;15 U/ml</td>
</tr>
</tbody>
</table>

**WHAT IS GLUTEN SENSITIVITY AND WHY IS IT IMPORTANT?**
High Gliadin Ab, SIGA is an indication that you are sensitive to foods that contain gluten. Gliadins are found in wheat, rye, oats, barley, and other grain glutsens, and are toxic to the intestinal mucosa (the lining of the intestines).

Continued elevations of Gliadin Ab, SIGA can worsen if a gluten diet is not followed and can lead to destruction of the villi. Villi are microscopic projections which cover the intestine, greatly increasing the surface area and therefore, increasing the ability to absorb nutrients.

Further consumption of gliadin can also result in fat intolerance, vitamin and mineral deficiencies, fatigue, skin conditions, osteoporosis, thyroid and various intestinal and malabsorptive problems. It is common to see vitamin B12, folic acid, iron and other trace nutrient deficiencies with high gliadin antibodies present. We may need to test for these deficiencies by performing additional lab tests.
Repeating Your Adrenal Stress Index Test

Please note that your Adrenal Stress Index Test will need to be repeated since there are positive findings. This test should be repeated on 10/08/2010.
Purpose of this Quiz

Patients who understand their body get better results with their treatment because:

• they can causatively deal with their physical condition, and
• as a result they follow their treatment recommendations

After you’ve read this document, you should be able to answer the following questions. Your on-line doctor will be reviewing this questionnaire with you. If you are unable to answer the question, refer to the section “Introduction - The Adrenal Glands” starting on page 3, so you can answer the question. All of the answers to these questions can be found in this document. There are no “trick questions”.

1) Name the hormones that the adrenal glands produce; See “What Are the Adrenal Glands?” on page 3

2) Do the adrenal glands produce a constant amount of hormones throughout the day? See “The Adrenal Rhythm and Its Importance” on page 3  □ Yes □ No

3) If the adrenal glands lose their normal rhythm, what eight body functions can be affected? See “Functions Affected by Abnormal Adrenal Rhythm” on page 4

__________________________________________________________________________________________________

__________________________________________________________________________________________________

__________________________________________________________________________________________________

4) Of these eight functions, which have been affected in your case?

__________________________________________________________________________________________________

__________________________________________________________________________________________________

__________________________________________________________________________________________________

5) Name the factors that YOU have that could be affecting normal adrenal function. See “What Factors Affect the Adrenal Glands?” on page 5 and the diagram “Factors Affecting the Adrenal Glands”

__________________________________________________________________________________________________

__________________________________________________________________________________________________


__________________________________________________________________________________________________

__________________________________________________________________________________________________

__________________________________________________________________________________________________
7) Based on your lab findings, what stage of the General Adaptation Syndrome are you in (alarm, resistance, exhaustion, etc.)? See “What Stage Am I In?” on page 13
**Circadian Rhythms**

Figure 1 — Examples of circadian rhythms in the human body. A circadian rhythm is a roughly 24-hour cycle in the biochemical, physiological, or behavioral processes of plants and animals.
# Hormones Produced by the Pituitary Gland

![Image of hormones produced by the pituitary gland]

<table>
<thead>
<tr>
<th>HORMONE</th>
<th>TARGET(S)</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTH (corticotrophin)</td>
<td>Adrenal Glands</td>
<td>Stimulates the adrenal gland to produce a hormone called cortisol. ACTH is also known as corticotrophin.</td>
</tr>
<tr>
<td>TSH (thyroid stimulating hormone)</td>
<td>Thyroid</td>
<td>Stimulates the thyroid gland to secrete its own hormone, which is called thyroxine. TSH is also known as thyrotrophin.</td>
</tr>
<tr>
<td>LH &amp; FSH (leutinizing hormone, follicle stimulating hormone; in males LH is called interstitial cell stimulating hormone - ICSH)</td>
<td>Ovaries (women) testes (men)</td>
<td>Controls reproductive functioning and sexual characteristics. Stimulates the ovaries to produce estrogen and progesterone and the testes to produce testosterone and sperm. LH and FSH are known collectively as gonadotrophins.</td>
</tr>
<tr>
<td>PRL (prolactin)</td>
<td>Breasts</td>
<td>Stimulates the breasts to produce milk. This hormone is secreted in large amounts during pregnancy and breastfeeding, but is present at all times in both men and women.</td>
</tr>
<tr>
<td>GH (growth hormone)</td>
<td>All cells in the body</td>
<td>Stimulates growth and repair. Research is currently being carried out to identify the functions of GH in adult life.</td>
</tr>
<tr>
<td>MSH (melanocyte-stimulating hormone)</td>
<td></td>
<td>Stimulate the production and release of melanin (melanosynthesis) by melanocytes in skin and hair. MSH signals to the brain have effects on appetite and sexual arousal. Melanocytes are responsible for moles, freckles, and suntan (and, if they turn cancerous, melanoma).</td>
</tr>
<tr>
<td>ADH (anti diuretic hormone, vasopressin or arginine vasopressin (AVP))</td>
<td>Kidneys</td>
<td>Controls the blood fluid and mineral levels in the body by affecting water retention by the (kidney) kidneys.</td>
</tr>
<tr>
<td>Oxytocin</td>
<td>Uterus and breasts</td>
<td>Affects uterine contractions in pregnancy and birth and subsequent release of breast milk.</td>
</tr>
</tbody>
</table>
MORE INFORMATION ABOUT THE ENDOCRINE SYSTEM

What is the Endocrine System
The endocrine system carries out a wide variety of physiological processes through chemical messengers called “hormones.” This system is a collection of glands that produces these hormones, which are necessary for normal bodily functions.

The Adrenal Glands
The adrenal glands lie on the upper inner surface of each kidney. Each gland consists of two parts that are quite distinct both in their structure and function. This is the adrenal medulla and the adrenal cortex. We’ll describe each part individually.

The Ovaries
The ovaries are multipurpose organs. They harbor, nurture, and guide the development of the egg so that when it is extruded from the ovary (ovulation) it has been prepared for its migration down the fallopian tube, its penetration by sperm, and its eventual implantation in the wall of the uterus. Additionally, the ovary is a sophisticated endocrine structure.

The Pancreas
In humans the pancreas weighs approximately 80 grams, has roughly the configuration of an inverted smoker’s pipe, and is situated in the upper abdomen. The head of the pancreas (equivalent to the bowl of the pipe) is immediately adjacent to the duodenum, while its body and tail extend across the midline nearly to the spleen. The bulk of pancreatic tissue is devoted to its exocrine function, the elaboration of digestive enzymes that are secreted via the pancreatic ducts into the duodenum.

The Parathyroid Gland
The parathyroid gland is the sole organ in the human body responsible for directly regulating calcium levels. The level of calcium in the blood is closely regulated, and wide fluctuations in either direction can be life-threatening. Calcium is a key element in the human body. Not only does it serve as the major constituent for bone, but it is also essential for the normal functioning of all body cells, as it is a mediator for many cell functions. For example, without calcium, blood will not clot.

The Pineal Gland
Melatonin is the only hormone secreted by the pineal gland. (The pineal gland is a tiny endocrine gland situated at the centre of the brain.) Melatonin was discovered in 1958 by Aaron B. Lerner and other researchers working at Yale University. Melatonin is produced in humans, other mammals, birds, reptiles, and amphibians. It is present in very small amounts in the human body.

The Pituitary Gland – Advanced Version
The pituitary gland lies at the base of the skull, nestled in a bony structure called the sella turcica. This article is lengthy but I’ve tried to break it up into readable parts. This is a complicated gland.

The Pituitary Gland – Basic Version
The pituitary gland is located at the base of the brain in a pocket inside the sphenoid bone known as the sella turcica. It weighs only 1/2 gram (.018 ounces) of which 85% is water and it produces 1/100,000th of a gram of hormones daily. The pituitary gland via hormone secretion directly affects the thyroid, adrenals, ovaries, testes, kidneys, breasts. According to An Endocrine Interpretation of Chapman’s Reflexes: the pituitary “also exerts a definite influence on the intestines, bladder, uterus, stomach, and spleen, its actions causing contraction of the plain, unstriped muscles of the entire body”.

The Testes
The testes, or testicles, are the male gonads. They contain germ cells that differentiate into mature spermatozoa, supporting
cells called Sertoli cells, and testosterone-producing cells called the Leydig cells. The germ cells migrate to the fetal testes from the embryonic yolk sac. The Sertoli cells are analogous to the granulosa cells in the ovary, and the Leydig (interstitial) cells are analogous to the stromal cells of the ovary.

The Thyroid Gland
All animal life requires oxygen for sustenance, and the human species is no exception. Oxygen drives the basic metabolic processes that permit growth, development, reproduction, physical movement, and constant body temperature. The complex of chemical interactions necessary to sustain these processes is called metabolism, and the prime, overall regulators of metabolism are the thyroid hormones.

Your report starts on the next page.
**Diagnos-Techs, Inc.**

Clinical & Research Laboratory  
PO BOX 385662, Tukwila, WA 98188-0662  
Tel. (425) 251-0596  
CLIA License # 30D0630141  

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**Your Lab Test Report**

**Accession # 10-79619**  

**BECOME HEALTHY NOW.COM**  
**GARY FARR, DC**  
**519 CLEAVLAND ST #115**  
**CLEARWATER FL 33755**  
**USA Tel. 727-461-7354  Fax: 1-727-443-6664**  

**Received : 08/11/2010**  
**Completed: 08/16/2010**  
**Reported : 08/16/2010**

**Results For:**  
**SAMPLE PATIENT**  
**Age: 57**  
**Sex: Female**  
**Dr. Code: Not Provided**  
**Patient’s Tel.: 970-963-1994**  
**Specimen Collected: 08/08/2010**

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASI</td>
<td>Adrenal Stress Index</td>
<td>Depressed</td>
<td>13-24 nM</td>
</tr>
<tr>
<td>TAF</td>
<td>Free Cortisol Rhythm</td>
<td>06:00 - 08:00 AM</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>11:00 - Noon</td>
<td>6</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td>04:00 - 06:00 PM</td>
<td>6</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td>10:00 - Midnight</td>
<td>7</td>
<td>Elevated</td>
</tr>
<tr>
<td>Cortisol Load</td>
<td>24</td>
<td>22 - 42 nM</td>
<td></td>
</tr>
</tbody>
</table>

The cortisol load reflects the area under the cortisol curve. This is an indicator of overall cortisol exposure, where high values favor a catabolic state, and low values are sign of adrenal deterioration.

**Figure 1. Circadian Cortisol Profile**

**Figure 2.**

The Cortisol release inducers fall into 4 broad categories shown in the adjacent flowchart. Long term adrenal axis maintenance and restoration, require optimization of all the cortisol inducers.

**Remarks:** Depressed morning cortisol, <13 nM, is suggestive of marginal HPA (Hypothalamic-Pituitary-Adrenal) performance. Normal rhythms exhibit highest cortisol value for the day at 7 – 8 AM.

An elevated morning/slight free cortisol value may be associated with insomnia, and caused by a stress response to an emotional or mental situation, nocturnal hypoglycemia or chronic pain and overt/hidden inflammation.

**What Next?**

a) Consider appropriate dietary modifications and glycemic control that include an insulin friendly carbohydrate-to-protein balance.

b) Consider initiating a mild to moderate aerobic exercise program.

c) The literature reports ACTH pulse height is attenuated by use of Phosphorylated serine supplement within 1 – 2 hours of time(s) of high cortisol.

d) Consider the palliative use of a natural or pharmaceutical anti-histamine or anti-inflammatory.

e) Consider balancing the sympathetic/parasympathetic systems using established techniques, examples: meditation and Tai Chi or heart rate variability coherence (Freeze Framing).

f) If above changes do not yield the desired clinical and follow up test results, look for low grade or hidden inflammation and infections. Examples: food intolerances, chronic gastrointestinal and other infections.
Diagnos-Techs, Inc.

Your Adrenal Stress Index Lab Test Findings

Accession: 10-79619

Test | Description | Result | Ref Values
--- | --- | --- | ---
DHEA | Dehydroepiandrosterone | Depressed | Adults (M/F): 3-10 ng/ml

**Figure 3** shows your cortisol-DHEA correlation was in:
- Zone 4 - Maladapted phase II

This zone represents a marginal cortisol output with reduced DHEA levels reflecting a limited adrenal response. The utilization of the precursor pregnenolone is usually limited and the adrenal cortex may show hypertrophic changes. Under stress most patients in maladaptation phase II will have a suboptimal response to stress. This suboptimal response is any response not consistent with a normal diurnal cortisol production pattern. This condition is usually the outcome of chronic and protracted stress exposure.

**INS**

Insulin

Fasting | <3 | Normal: 3-12 uIU/mL
Non-Fasting | <3 | Depressed | Optimal: 5-20 uIU/mL

Depressed non-fasting insulin within four hours after meal. This may be caused by a small carbohydrate load in the preceding challenge meal or a reduction in pancreatic insulin release or synthesis. Consider a closer examination of challenge meal composition to rule out pre-diabetic tendencies.

**Why Test for Insulin?**

Insulin activity is affected by the stress and cortisol responses. Chronic stress with cortisol elevation antagonizes insulin, and may cause functional insulin resistance. Furthermore, chronic hypercortisolism causes hyperinsulin responses to carbohydrate intake. Chronic insulin resistance and overproduction lead to pancreatic exhaustion.

**Basic facts about insulin values.**

**Fasting:** This insulin value is elevated in cases of insulin resistance.

**Non-Fasting:** This insulin value varies with type of meal and time of sample collection. See figure 4b. Adapted, Br. J. Nutr. 2003, 90:833. For an after meal insulin, instruct patient to eat 50g of carbohydrate or what is equivalent to 200 calories about 45-90 minutes before noon sample collection. Examples: 2 slices of white bread and 1 cup of orange juice OR 1 cup of cooked oatmeal and 1 cup of orange juice OR 2 ounces of corn flakes snack.

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<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>P17-OH</td>
<td>17-OH Progesterone</td>
<td>&lt;15</td>
<td>Depressed</td>
</tr>
</tbody>
</table>

Your Adrenal Stress Index Lab Test Findings

Adults
Optimal: 22-100 pg/ml
Borderline: 101-130 pg/ml
Elevated: >130 pg/ml

**Figure 5. Adrenal Steroid Synthesis Pathway**

- Mineral Cortisol Pathway
- Glucocorticoid Pathway
- Androgen Pathway

- Progesterone
- 17 alpha-OH Progesterone
- 17-OH Progesterone
- Pregnenolone
- Androsterone

**Figure 5.** The preferential pathway under stress shunts pregnenolone into cortisol at the expense of DHEA.

- 21-Hydroxylase enzyme, may be deficient with high 17-OHP.

MB26  Total Salivary SIgA  8  Depressed

A depressed mucosal SIgA may be attributed to one or more of the following reasons:
1. Excessive chronic cortisol output causes reduction in SIgA production due to low counts of SIgA immunocytes. Appropriate restorative treatments have been shown to produce incremental improvements in SIgA.
2. A short imbalance in sympathetic to parasympathetic activity rapidly inhibits SIgA release from the mucosal immunocytes for several hours.
3. Chronic deficits in cortisol and/or DHEA levels.
4. Possible systemic deficit in capacity to produce IgA - an inherited problem. Rule out possibility with a serum IgA test. A normal finding rules out this possibility.

Normal: 25-60 mg/dl
Borderline: 20-25 mg/dl

**Basic Facts About SIgA**
1. Secretory IgA (SIgA) is secreted by the various mucosal surfaces. It is mostly a dimeric molecule. Less than 2% of Saliva is of serum origin. The secretory component of SIgA stabilizes it against enzymatic and bacterial degradation.
2. The main functions of SIgA include Immune Exclusion, Viral and Toxin Neutralization, Plasmid Elimination, and Inhibition of Bacterial Colonization. SIgA immune complexes are not inflammatory to the mucosal surfaces.

**Figure 6. Effect of Emotion on SIgA Release**

Anger versus Care

5 minutes of Care
5 minutes of Anger

Autonomic System Imbalance Caused by Emotional Stress Inhibits SIgA Release

Heartwell Institute
Your Adrenal Stress Index Lab Test Findings

Diagnos-Techs, Inc.

Accession: 10-79619

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Result</th>
<th>Ref Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>FI4</td>
<td>Gliadin Ab, SIgA (Saliva)</td>
<td>52</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Patient shows moderate to severe intolerance or reactivity to Gliadin and is usually symptomatic with ongoing low to high-grade intestinal inflammation following Gliadin intake has been demonstrated. An over-representation of skin conditions, osteoporosis, thyroid and various intestinal and malabsorptive problems is found in this sub-population. Often observed is a marginal nutritional status of Vitamin B12, Folic acid, iron and other trace nutrients.

Borderline: 13-15 U/ml
Positive: >15 U/ml

Notes on Gliadin Ab Test
Gliadins are polypeptides found in wheat, rye, oat, barley, and other grain glutes, and are toxic to the intestinal mucosa in susceptible individuals.
Healthy adults and children may have a positive antigladian test because of subclinical gliadin intolerance. Some of their symptoms include mild enteritis, occasional loose stools, fat intolerance, marginal vitamin and mineral status, fatigue, or accelerated osteoporosis.

Example of restoration Plan
All Examples of Restoration Plans are for Illustrative/Educational Purpose Only. Actual report data should be used within clinical cont
To reduce high cortisol, consider using ACTH-dampening Phosphorylated serine supplements, take one or two capsules between or 15 to 20 minutes before meals within 1 to 2 hours of elevated cortisol time(s).

Example- Cortisol Augmentation or Licorice Supplementation

<table>
<thead>
<tr>
<th>Observed Cortisol Value(nM)</th>
<th>Intake Time</th>
<th>Typical Cortisol Dose</th>
<th>-OR-</th>
<th>Whole Licorice Extract Glycyrrhizic Acid Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-13</td>
<td>6-7AM</td>
<td>5mg</td>
<td>10-15mg</td>
<td></td>
</tr>
<tr>
<td>5-9</td>
<td></td>
<td>7.5mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>less than 5</td>
<td></td>
<td>12.5mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Noon Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11AM-12PM</td>
<td></td>
<td>7.5mg</td>
<td>5-10mg</td>
<td></td>
</tr>
<tr>
<td>less than 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Afternoon Value</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4PM</td>
<td></td>
<td>5mg</td>
<td>5-10mg</td>
<td></td>
</tr>
<tr>
<td>less than 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Do not use licorice in overtly hypertensive individuals. Do not exceed a total daily dose of 25-35mg of glycyrrhizic acid.
Re-test by 8th week of use. Avoid use of licorice in pregnant women.
Diagnos-Techs, Inc.

Test Description Result Ref Values

Example of DHEA Augmentation: Female

<table>
<thead>
<tr>
<th>Weekly Protocol</th>
<th>Oral DHEA</th>
<th>Sublingual DHEA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM Dosage</td>
<td>PM Dosage</td>
</tr>
<tr>
<td>1st-3rd week</td>
<td>5mg</td>
<td>None</td>
</tr>
<tr>
<td>4th-12th week</td>
<td>5mg</td>
<td>5mg</td>
</tr>
<tr>
<td>13th week</td>
<td>Retest DHEA</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** DHEA augmentation not applicable in cases of Testosterone & Estrogen associated diseases. Patient-specific treatments to be determined by healthcare providers.

To improve SIgA levels consider two aspects:

1) Reduction in suppression when applicable:
   a. Optimize cortisol/DHEA balance
   b. Balance sympathetic/parasympathetic activity
   c. Rule out inherited IgA production deficit

2) Production Enhancement may include:
   a. Exercise program
   b. Vitamin E complex e.g. wheat germ oil
   c. Botanical adaptogen supplementation

Example of Gluten Intolerance Management

<table>
<thead>
<tr>
<th>Positive Gliadin: 15-30 U/ml</th>
<th>Positive Gliadin: &gt;30 U/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initially, avoid offending grains for 3-4 months</td>
<td></td>
</tr>
<tr>
<td>• Afterwards, 5th-7th day rotation is permitted</td>
<td></td>
</tr>
</tbody>
</table>

**Low tolerance foods:**
- X Wheat
- X Oats
- X Barley
- X Rye
- X Spelt
- X Triticale

**Tolerable foods:**
- ✓ Corn
- ✓ Arrowroot
- ✓ Barley Malt
- ✓ Millet
- ✓ Tapioca
- ✓ Wheat Grass
- ✓ Rice
- ✓ Wild Rice
- ✓ Barley Grass
- ✓ Taro
- ✓ Buckwheat
- ✓ Amaranth
- ✓ Teff
- ✓ Quinoa

**COURTESY INTERPRETATION** of test and technical support are available upon request, to Physicians Only
YOUR TREATMENT RECOMMENDATIONS

STEP 1 OF YOUR PROGRAM - BALANCE ADRENAL AND PITUITARY HORMONES

TREATMENT OBJECTIVES - ADRENAL STRESS INDEX TEST

1. Address high PM cortisol levels.
2. Address low morning cortisol levels. This is an indicator of adrenal/hypothalamus/pituitary hormone imbalance.
3. Address low DHEA levels.
4. Correct High Fasting or Non-Fasting Insulin levels - this are indicators of blood sugar swings (hyper or hypoglycemia) that can lead to diabetes if not corrected.
5. Correct the Low 17-OH Progesterone levels - adequate levels of 17-OH Progesterone must be present for cortisol to be synthesized.
6. Increase levels of low Salivary SIgA - low levels of Salivary SIgA is an indicator of poor immune function
7. Address the high levels of Gliadin Ab, SIgA - this is an indicator of gluten sensitivity and/or celiac disease.

STEP 1 DIETARY RECOMMENDATIONS

Low Glycemic Diet

Your lab finding reveal either high insulin, high HA1c levels, or hyper of hypoglycemic symptoms. You should follow the Category 1 Diet - Hgb A1C >8 or Urinary Glucose > 500mg/dl diet on page 9. After printing this document, read it thoroughly. Near the end of the document is a section Test Your Understanding. Answer these questions and I will be going over the questions with you on a future call. Click here to download the Low Glycemic Diet:


Gluten Free Diet

Your lab finding reveal high sensitivity to gluten. You should follow the gluten free diet.

Download and print-The Gluten Free Diet

YOUR SUPPLEMENT RECOMMENDATIONS

STEP 1 SUPPLEMENTS
Please Note: Your supplement and dietary recommendations can also be viewed in your program at this link: https://www.becomehealthynow.com/myaccount/my_health_progress/my_program.php

Your supplements for your Adrenal Stress Index Test are listed in order of the findings presented by your report. Clicking on the link will take you to that section of your recommendations.

MAJOR LAB TEST FINDINGS

- 8) Marginal HPA (Hypothalamic-Pituitary-Adrenal) performance - Low morning cortisol - Primary Support
- 8a) Marginal HPA (Hypothalamic-Pituitary-Adrenal) performance - Low morning cortisol - Secondary Support
- 9) Insomnia - Stress Response - Nocturnal Hypoglycemia - Chronic Pain - Overt/Hidden Inflammation - Elevated morning or night time cortisol OR Elevated noon/afternoon free cortisol
- 9a) Insomnia - Stress Response - Nocturnal Hypoglycemia - Chronic Pain - Overt/Hidden Inflammation — Elevated morning or night time cortisol OR Elevated noon/afternoon free cortisol - Secondary Support
- 10) Low or High Fasting or Non-Fasting Insulin - Primary Support
- 10a) Low or High Fasting or Non-Fasting Insulin - Secondary Support
- 11) Low 17-OH Progesterone
- 13) Low Salivary SIgA
- 15) High Gliadin Ab, SIgA

SUPPLEMENT RECOMMENDATIONS — ADRENAL STRESS INDEX TEST — 08/08/2010

8) MARGINAL HPA (HYPOTHALAMIC-PITUITARY-ADRENAL) PERFORMANCE — LOW MORNING CORTISOL - PRIMARY SUPPORT

<table>
<thead>
<tr>
<th>NAME OF SUPPLEMENT</th>
<th>NUMBER PER DAY</th>
<th>HOW TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB5-Plus</td>
<td>3 tablets in the a.m. and 3 tablets at noon</td>
<td>With Food</td>
</tr>
</tbody>
</table>

ADB5-Plus is used in supporting the adrenal glands. This is a vitamin/mineral/herbal/glandular/enzyme formulation for adrenal support is formulated for professional clinical application in any adjunctive nutritional protocol to support and normalize adrenal function in such common contemporary conditions as adrenal hypofunction (Hypoadrenia), adrenal insufficiency, postural hypotension, ligament laxity, reactive hypoglycemia, low blood pressure (Hypotension), immune insufficiency, chronic fatigue syndrome (CFS), fatigue, hypoglycemia, cognitive dysfunction, depression, anxiety, and stress.

Cytozyme PT/HPT

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<th>NAME OF SUPPLEMENT</th>
<th>NUMBER PER DAY</th>
<th>HOW TAKEN</th>
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<tbody>
<tr>
<td>Cytozyme PT/HPT</td>
<td>4 Tablets</td>
<td>With Food</td>
</tr>
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</table>

Glandular product to control secretion of pituitary and hypothalamic hormones.

Cytozyme-PT/HPT is a source of neonatal (1 to 3 day old) bovine pituitary and hypothalamus tissue. It is one of the premiere neonatal bovine glandular products produced by Biotics Research. A great deal of the thyroid hypofunction that we see, according to my findings in tracking blood chemistries, have their locus in the anterior pituitary or adrenal glands.

Once you have completed blood studies, and the thyroid panel is perfectly normal or if anything, the TSH is low rather than high. High is where you would expect to find it, above 4.4, if the patient was a true hypothyroid. However, we find TSH values down below 2.0, which is telling me that the pituitary and the thyroid simply are not communicating and in some cases the hypofunction at the pituitary level is also causing either adrenal hypofunction or hyperfunction.

This product works well with Thyrostim to give the thyroid gland support. Even though it has no thyroid tissue in it, it works wonderfully in thyroid hypofunction because it is providing accessory nutrients that the thyroid needs to function, along with neonatal glandular support and accessory nutrients for the real problem, the anterior pituitary. **Contraindicated with pituitary tumors.**
### 8) MARGINAL HPA (HYPOTHALAMIC-PITUITARY-ADRENAL) PERFORMANCE — LOW MORNING CORTISOL - PRIMARY SUPPORT

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<tr>
<th>NAME OF SUPPLEMENT</th>
<th>NUMBER PER DAY</th>
<th>HOW TAKEN</th>
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<tbody>
<tr>
<td>Optimal EFAs Caps</td>
<td>6 Capsules</td>
<td>With Food</td>
</tr>
</tbody>
</table>

**NOTE:** 4 capsules of Optimal EFA Capsules = 1 teaspoon of the liquid

Contains essential fatty acids needed for hormone production and to reduce inflammation.

EFAs or Essential Fatty acids are called “essential” because your body does not make them on it’s own. They must be provided via dietary sources. Optimal EFAs Liquid from Biotics Research Corp. is a unique blend of optimally balanced essential fatty acids — ALA, EPA, DHA, GLA and Oleic Acid — from fish, flaxseed and borage oils.

The American population generally consumes too many “bad” fats, and not enough “good” fats. This unbalanced consumption can lead to pain, inflammation and high blood-lipid levels. Research shows that the consumption of a proportionally balanced combination of essential fatty acids such as found in Optimal EFAs contributes to overall health. EFAs or Essential Fatty acids are called “essential” because your body does not make them on it’s own. They must be provided via dietary sources. Optimal EFAs Liquid from Biotics Research Corp. is a unique blend of optimally balanced essential fatty acids — ALA, EPA, DHA, GLA and Oleic Acid — from fish, flaxseed and borage oils.

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### 8A) MARGINAL HPA (HYPOTHALAMIC-PITUITARY-ADRENAL) PERFORMANCE — LOW MORNING CORTISOL - SECONDARY SUPPORT

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<tr>
<th>NAME OF SUPPLEMENT</th>
<th>NUMBER PER DAY</th>
<th>HOW TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>GlucoBalance</td>
<td>6 Capsules</td>
<td>With Food</td>
</tr>
</tbody>
</table>

If the problem with increased blood sugar or triglycerides is significant, increase this to 3 caps, 3x/day with meals for the first 30 days of support.

Blood sugar control; controls cravings for sweets. GlucoBalance is an excellent formula for insulin dependent diabetics, non-insulin dependent diabetics, patients with increased triglycerides, increased LDL cholesterol and decreased HDL cholesterol, and always with hyperinsulinism (Syndrome-X/Metabolic Syndrome). **Note:** If you are taking insulin, insure that you take your blood sugar levels frequently as GlucoBalance will often have a dramatic effect on insulin needs. Your insulin dose may have to be modified accordingly.

### 8A) MARGINAL HPA (HYPOTHALAMIC-PITUITARY-ADRENAL) PERFORMANCE — LOW MORNING CORTISOL - SECONDARY SUPPORT

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<th>NAME OF SUPPLEMENT</th>
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</thead>
<tbody>
<tr>
<td>PheniTropic</td>
<td>1-2 at bedtime</td>
<td>With Food</td>
</tr>
</tbody>
</table>

PheniTropic by Biotics Research contains beta-Phenyl-gamma-aminobutyric acid, which is a derivative of GABA, a naturally occurring inhibitory neurotransmitter. Helps with sleep, anxiety and stress. **PheniTropic should not be taken with alcohol.**

| De-Stress          | 4 Capsules - People weighing less than 110 pounds should take one capsule twice a day; two twice a day for people over 110 pounds. | Empty Stomach |

Used in people with high stress; works better than either Kava Kava or St. John’s Wort.
### Step 1 - My Supplement Schedule & Dietary Recommendations

#### 9) Insomnia - Stress Response - Nocturnal Hypoglycemia - Chronic Pain - Overt/Hidden Inflammation

**Elevated Morning or Night Time Cortisol or Elevated Noon/Afternoon Free Cortisol**

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<th>NAME OF SUPPLEMENT</th>
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<tbody>
<tr>
<td>Cytozyme PT/HPT</td>
<td>4 Tablets</td>
<td>With Food</td>
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Glandular product to control secretion of pituitary and hypothalamic hormones.

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<th>NAME OF SUPPLEMENT</th>
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<tbody>
<tr>
<td>Optimal EFAs Caps</td>
<td>6 Capsules</td>
<td>With Food</td>
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</table>

Contains essential fatty acids needed for hormone production and to reduce inflammation.

EFAs or Essential Fatty acids are called “essential” because your body does not make them on it’s own. They must be provided via dietary sources. Optimal EFAs Liquid from Biotics Research Corp. is a unique blend of optimally balanced essential fatty acids — ALA, EPA, DHA, GLA and Oleic Acid — from fish, flaxseed and borage oils.

The American population generally consumes too many “bad” fats, and not enough “good” fats. This unbalanced consumption can lead to pain, inflammation and high blood-lipid levels. Research shows that the consumption of a proportionally balanced combination of essential fatty acids such as found in Optimal EFAs contributes to overall health. EFAs or Essential Fatty acids are called “essential” because your body does not make them on it’s own. They must be provided via dietary sources. Optimal EFAs Liquid from Biotics Research Corp. is a unique blend of optimally balanced essential fatty acids — ALA, EPA, DHA, GLA and Oleic Acid — from fish, flaxseed and borage oils.

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### 9A) Insomnia - Stress Response - Nocturnal Hypoglycemia - Chronic Pain - Overt/Hidden Inflammation

**Elevated Morning or Night Time Cortisol or Elevated Noon/Afternoon Free Cortisol - Secondary Support**

<table>
<thead>
<tr>
<th>NAME OF SUPPLEMENT</th>
<th>NUMBER PER DAY</th>
<th>HOW TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphatidylserine</td>
<td>6 Capsules</td>
<td>With Food - if an Adrenal Stress Index test has been performed, this product should be taken before meals within 1 to 2 hours of the elevated cortisol time(s).</td>
</tr>
</tbody>
</table>

Each capsule of phosphatidylserine is standardized to supply 100 mg of phosphatidylserine and also typically provides a 300 mg blend of phosphatidic acid, phosphatidylserine, soy phospholipids and glycerides, phosphatidylcholine and phosphatidylethanolamine. Phosphatidylserine has been found to be effective with short term memory loss, mood improvement, myelin sheath repair and for reducing cortisol production (hyperladdenia).
### 10) LOW OR HIGH FASTING OR NON-FASTING INSULIN - PRIMARY SUPPORT

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<th>NAME OF SUPPLEMENT</th>
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<tbody>
<tr>
<td>GlucoBalance</td>
<td>6 Capsules</td>
<td>With Food</td>
</tr>
<tr>
<td></td>
<td>If the problem with increased blood sugar or triglycerides is significant, increase this to 3 caps, 3x/day with meals for the first 30 days of support.</td>
<td></td>
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</tbody>
</table>

Blood sugar control; controls cravings for sweets. GlucoBalance is an excellent formula for insulin dependent diabetics, non-insulin dependent diabetics, patients with increased triglycerides, increased LDL cholesterol and decreased HDL cholesterol, and always with hyperinsulinism (Syndrome-X/Metabolic Syndrome). **Note:** If you are taking insulin, insure that you take your blood sugar levels frequently as Glucobalance will often have a dramatic effect on insulin needs. Your insulin dose may have to be modified accordingly.

| Amino Acid Quick Sorb | 15-20 drops between meals | With Food |

Has a stabilizing effect on blood glucose levels; used in situations where there is a need to rapidly increase blood glucose levels, such as reactive hypoglycemia.

Amino Acid Quick Sorb is a liquid containing nine free form L-amino acids that provide a stabilizing effect on blood glucose levels. It is used in situations where there is a need to rapidly increase blood glucose levels, such as endurance sports and reactive hypoglycemia.

Many of our patients who need the product keep it in their car for use when they are driving long distances. When they become fatigued or start to suffer with other symptoms of hypoglycemia, ten or fifteen drops under their tongue will usually relieve the symptoms until they are able to stop and eat. We also have several world class athletes, such as tennis players, who take this product between games or during events to keep their blood sugar and energy levels up.

### 11) LOW 17-OH PROGESTERONE

<table>
<thead>
<tr>
<th>NAME OF SUPPLEMENT</th>
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<th>HOW TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Pregnenolone (Nutriwest)</td>
<td>8 Tablets</td>
<td>Take SUBLINGUALLY (under the tongue) and suck on it until it dissolves</td>
</tr>
</tbody>
</table>

Used for stress; hormonal imbalance; brain chemistry; anxiety; irritability; memory; learning; protection of neurons; growth and development of nerve cells; cognitive function. **Pregnenolone is a hormone precursor and should be used under the supervision of a trained licensed professional.**

### 13) LOW SALIVARY SIGA

<table>
<thead>
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<th>NAME OF SUPPLEMENT</th>
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</thead>
<tbody>
<tr>
<td>IPS</td>
<td>6 Capsules</td>
<td>Empty Stomach</td>
</tr>
</tbody>
</table>

IPS stands for intestinal permeability supplement. This product is designed to stimulate growth and repair of the intestinal mucosa as well as aiding in gut detoxification. Each capsule contains glutamine, glucosamine sulfate, Tillandsia root, Gamma Oryzanol, glutathione, Jerusalem artichoke, Lamb intestine concentrate and vegetable cellulase. This is a powerful product for restoring gut integrity. It normalizes the immunity of the G.I. tract, especially in the bowel, reducing viral load.
**STEP 1 - MY SUPPLEMENT SCHEDULE & DIETARY RECOMMENDATIONS**

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END OF ASI SUPPLEMENT RECOMMENDATIONS