

### **Saliva Testing**

The Nutrition and Health Center utilizes the leading salivary-based testing and research laboratory in the United States to measure hormones. This method is called Enzyme Linked Immunosorbent Assay; it measures “free fraction hormone levels,” giving more information than measuring “bound hormone levels.” The commonly used blood and serum hormone tests look only at the level of hormones that are present in a person’s tissues; this is known as “bound hormone levels.” Saliva testing has many advantages over blood testing including:

- Saliva specimen collection does not require a blood draw and there are no risks to you
- Saliva collections are convenient and can be done at work or at home
- When stored properly, saliva samples are stable for several weeks
- With an accuracy of 92-96%, saliva testing is more accurate than blood testing
- The ability to collect more than one specimen which provides more information than a single collection
- Compared to blood testing, saliva testing is also more affordable
- Saliva testing looks at the “unbound hormone levels” also known as “free fraction hormone levels” which are the hormone levels that are available to be used by the body’s tissues. This gives a better idea of the levels of hormones that are actually influencing the tissues, rather than just the level of hormones that are present in the tissues

### **Types of Saliva Tests**

There are various hormones in your body, so there are various corresponding saliva tests that can be administered. The tests that we use are the Female Hormone Panel™ (FHP™) test, Adrenal Stress Index™ (ASI), and the Flexi-Matrix Customized panel.

- The Flexi-Matrix™ Customized Test panel allows you to select 3-15 of the hormones listed below to test from one saliva test kit.
  - Male and Female Hormones
    - FSH
    - LH
    - Estrone
    - Estradiol
    - Estriol
    - Progesterone
    - Testosterone
    - Androstenedione
    - DHT
  - Adrenal and Stress Hormones
    - Cortisol 6am-8am
    - Cortisol 11am-Noon
    - Cortisol 4pm-5pm
    - Cortisol 10pm-Midnight
    - 17-OH Progesterone
    - DHEA + DHEA/S Pooled
- The Female Hormone Panel™ (FHP™) is a non-invasive test consisting of 11 saliva specimens collected during specified time periods throughout the menstrual cycle. The ovaries are a major component of the female reproductive cycle and they release hormones in a cyclical manner which is referred to as the menstrual cycle. The Female Hormone Panel™ provides a dynamic mapping of the free fraction levels of Estradiol (E2) and Progesterone (P) throughout one cycle. In addition, the cycle average of Testosterone (T) and DHEA are measured. The Female Hormone Panel™ includes:

Estradiol (x11), Progesterone (x11), cycle average Testosterone and DHEA/DHEA-S, 3 Progesterone production indices, 4 Estradiol production indices, a full cycle P/E ratio graph and an example of a restorative plan. The expanded Female Hormone Panel™ (eFHP™) includes an additional five (5) FSH and five (5) LH measurements.

- The Adrenal Stress Test panel was introduced in 1989 to evaluate stress, a leading cause of morbidity and mortality. This adrenal saliva hormone test has been created to evaluate adrenal capacity to produce cortisol. Cortisol measurements are taken throughout the day in four different readings. The information provided by the cortisol curve helps to determine the human stress response. Natural protocols are used to help vitality and restore adrenal function.

### **Why Evaluate Female Hormones?**

The human ovary releases its hormones in a cyclical manner, which is referred to as the menstrual cycle. The average cycle is 26-30 days. The timing and pacing of hormone release is governed by GnRH, FSH and LH, hormones from the hypothalamus and pituitary glands in the brain. The two major classes of ovarian hormones released during the menstrual cycle are estrogens and progesterones, also known as the female steroid sex hormones. The major and most active estrogen released is estradiol, while the major progesterone is progesterone.

Applications for the Female Hormone Panel™ include:

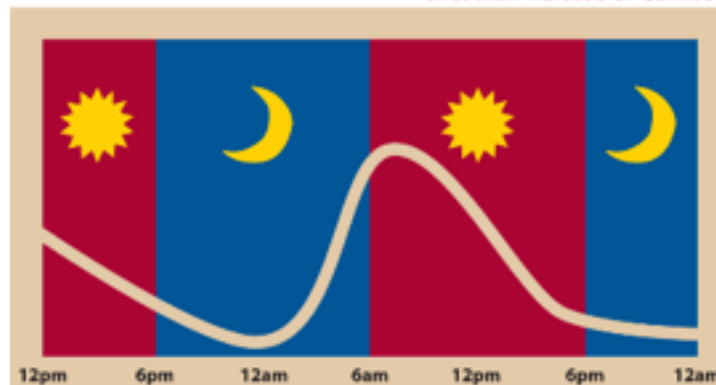
- **Detection of Luteal Phase Deficit** - There are at least three luteal phase-deficit patterns which are characterized by a progesterone/estrogen imbalance. This imbalance is usually associated with PMS, infertility, fibroids and other female hormone-related problems and can be readily detected by our panels.
- **Hormonal Imbalance and PMS** - Many women suffer from hormonal imbalance in the estrogen to progesterone ratio. Our panels can define the hormonal state with exquisite accuracy which, in turn, provides specific insights for appropriate intervention to relieve hormonal imbalance and PMS-related symptoms.
- **Customized Hormone Therapy** - Presently, female hormone therapy is not individualized to the needs of each woman, because current diagnostic tests do not provide sufficient data. Consequently, most women are empirically treated without regard to their individualized physiology and specific needs. The FHP™, for the first time, allows for customized therapy.
- **Detection and monitoring of:**
  - Functional infertility
  - Influence of diet, exercise and other lifestyle factors on the cycle
  - Menstrual problems originating in the brain
  - Early pregnancy problems, such as spontaneous miscarriage
  - Cycle irregularities, following the use of birth control pills
  - Dysmenorrhea (painful and heavy periods)
  - Migraine headaches
  - Cystic ovarian disease
  - Early osteoporosis

### **Why Evaluate the Adrenals?**

The human adrenal glands vary their steroid hormone levels throughout the day. The hormones are actually released in a cycle, with the highest value in the morning and the lowest value at

night when functioning properly. This 24-hour cycle is called the circadian rhythm and is depicted below:

**Figure 1**  
Circadian Release of Cortisol



An abnormal adrenal rhythm can influence many functions of the body; therefore, measuring them can provide insight of imbalances. A few functions that the adrenal hormones influence include:

- **Energy Production** - Abnormal adrenal function can alter the ability of cells to produce energy for the activities of daily life. People who have a hard time rising in the morning, or who suffer from low energy throughout 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. The Adrenal Stress Index™ panel measures stress hormones and insulin, to help ferret out the causes of fatigue, cravings and obesity.
- **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 wasting with chronic pain.
- **Bone Health** - The adrenal rhythm determines how well we build bone. If the night and morning cortisol levels are elevated, our bones do not rebuild well, and we are more prone to osteoporosis. Stress is the enemy of the bones. In postmenopausal women, the effect of stress worsens due to female hormone imbalances.
- **Immune Health** - Various immune cells (white blood cells) cycle in and out of the spleen and bone marrow. The immune system trafficking follows the cortisol cycle. 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 in the lungs, throat, urinary tract and intestines. With reduction in the surface antibody (called secretory IgA), the resistance to infection is reduced and allergic reactions are believed to increase.
- **Sleep Quality** - The ability to enter REM sleep cycles and experience regenerative sleep is interrupted by high cortisol values at night and in the morning. Chronic lack of REM sleep can reduce a person's mental vitality, vigor and induce depression.
- **Skin Regeneration** - Human skin regenerates mostly during the night. With higher night cortisol values, less skin regeneration takes place. Therefore a normal cortisol rhythm is essential for optimal skin health.
- **Thyroid Function** - The level of cortisol at the cell level controls thyroid hormone production. Often, hypothyroid symptoms such as fatigue and low body temperature are due to an adrenal maladaptation.

- **Grain Intolerance and Stress Response** - Approximately 12-18% of the U.S. population suffers from a genetic intolerance to grains, such as wheat, rye or barley contained in cereals, breads and pasta. A high incidence occurs in people with Celtic, Nordic, non-Caucasian and Mediterranean ethnicity. The gut becomes inflamed within 30 minutes after consuming grains, and this can lead to an adrenal stress response, increased cortisol and reduced DHEA.
- **Chronic Fatigue Syndrome (CFS)** - A common HPA axis defect in CFS is impaired corticotrophin release. As a result, low cortisol and eventual adrenal atrophy may be observed. Depleted adrenals with flat rhythms are often seen on the ASI™ panel. Simultaneous use of several therapies can help improve the debilitating effects of CFS.
- **Glycemic Dysregulation** - Chronic hypoglycemia can impair normal adrenal function by repetitive overstimulation of cortisol production. Recurring exposure to high cortisol will impair insulin activity, and invariably lead to insulin resistance and beta-cell exhaustion (diabetes). The ASI™ panel investigates the insulin-cortisol relationship under real-life conditions to allow targeted and meaningful interventions. This panel is useful in the following clinical situations: rapid weight gain and obesity, deranged blood lipids, sugar blues, early diabetes and associated emotional disturbances.
- **Allergies/Autoimmune Disorders** - More than fifty years ago, Dr. W. Jefferies (author of Safe Uses of Cortisol) discovered that patients with environmentally triggered allergies and autoimmune diseases dramatically benefited when given cortisol for other purposes. More recently, German researchers reported that disruption of the adrenal axis and cytokine relationships lead to predisposition and aggravation of autoimmune diseases. The findings of the ASI™ help identify patients with autoimmune diseases and adrenal problems who can benefit from cortisol supplements.
- **Depression/ADD** - Several recent publications report a hyperactive HPA axis in depressed patients. Elevated midnight salivary cortisol is now considered one of the best tests in diagnosing endogenous depression. Other anomalies in cortisol rhythm usually accompany the midnight elevation. On the other hand, cortisol elevations and rhythm disruptions throughout the day are typical of attention deficit disorders (ADD). The anomalous cortisol findings in depression and ADD can be diagnosed successfully with the ASI™. Subsequent interventions to rectify the time-specific cortisol elevations (during the day or night) are usually effective when applied under proper supervision.