

Determining & Testing Hormone Levels

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(Special thanks to Dr. Kenna Stephenson, clinical professor at University of Texas at Tyler, and member of the Scientific Advisory Network (SAN) of Women in Balance. This is an excerpt from her recently published book, Awakening Athena)

Hormonal balance is essential to good health for women of all ages. Unfortunately, the accuracy of the tests used to determine hormone levels varies widely. The two most prevalent types of testing for hormone imbalance are saliva testing, in which a small sample of the patient's saliva is analyzed to determine the levels of specified hormones, and serum testing, which is based on the analysis of a blood sample from the patient.

Saliva Testing

Saliva testing has been used in clinical research, including studies conducted at the National Institutes of Health (NIH) for more than 30 years. Saliva testing has been available to practicing physicians for over a decade, and Medicare and many insurance companies provide reimbursement for its use. Over years of clinical practice, I have found that saliva testing is the most accurate measurement of the body's availability of the steroid hormones cortisol and DHEA and the sex steroid hormones estrogen, progesterone, and testosterone. Saliva testing correctly identifies the level of hormone at the cellular level (i.e. the biologically interactive form of the hormone), in contrast to a serum (blood) test, which measures the level of hormone circulating in the bloodstream.

Serum Testing

Most serum tests define the normal range of hormones very broadly, which is a distinct disadvantage to their use. After the patient's blood has been drawn, a portion of the blood sample (the serum) is used to measure hormone levels. Most serum testing measures the level of "free" hormone (the hormone that can easily enter the cell), the level of "total" hormone (the hormone attached to substances that carry hormones in the bloodstream), or a calculated combination of both free and total levels of hormone. It is not an accurate reflection of the bioavailable hormone (the amount of hormone that is active in organs and tissues). In addition, the results of serum testing are often inconsistent, especially if the hormone value indicated is in the low-normal range.

Many women whose serum test results are normal cannot understand why they continue to experience the symptoms of hormone imbalance. Saliva testing, however, provides a more exact range of normal results. Saliva tests reflect the amounts of hormones that are active within cells, which most accurately identifies the levels of sex steroid hormones and steroid hormones that are produced by the body or are active in the body when a patient is receiving hormone therapy.

At present, however, the levels of thyroid hormones can be measured *only* by serum testing or blood spot testing. Follicle-stimulating hormone (FSH) testing, which is a type of serum test, is another frequently used hormone evaluation. FSH directs the maturation of ovarian follicles and the release of estrogen. It also prepares the uterus for the changes that occur during the first half

of the menstrual cycle. The FSH test is frequently used to determine the hormonal status of premenopausal patients who may complain of hot flashes, mood changes, or other symptoms.

Several of my patients had been told by a former physician that their symptoms were not hormone-related because the result of their FSH test was in the normal range. The FSH test should not be used as an accurate measure of sex steroid hormone production or an indication of reproductive status for most women, because the level of FSH fluctuates widely during the decade preceding menopause.

A properly conducted FSH test requires that blood be drawn 3 times at 60-minute intervals beginning precisely at 8:00 AM. The FSH reference ranges are based on the average of those three levels, but I have found that the test is often performed improperly. In many cases, only one blood sample is drawn for evaluation, usually during an appointment with the patient's physician at time other than 8:00 AM. The vital clinical decisions about a patient's hormonal status and subsequent treatment are usually based on the results of that single test.

Continued - Saliva Testing Versus Serum Testing

In my early years of clinical practice, I was frequently frustrated with the inaccuracy of serum testing, the results of which often did not support my observations of patients. I changed my clinical approach. I have ordered saliva tests instead of serum tests to measure hormone levels in thousands of patients. The accuracy of those results has greatly enhanced my diagnostic and therapeutic decision-making.

Saliva testing is easy to obtain and to perform. The patient can collect the sample at home or at work, thereby avoiding travel to a testing laboratory and the need for painful needle sticks. In addition, the stress induced by the venipuncture required to obtain blood for testing can significantly alter serum test results.

For that reason, a serum test may not accurately measure the patient's usual serum hormone level. Saliva testing, however, has not been shown to cause a stress response in patients. Despite those advantages, saliva testing remains a greatly underutilized evaluation, and many women and their physicians are not yet familiar with its benefits.

When compared with serum testing, however, saliva testing does have some disadvantages. Proficiency standards mandated for serum testing by the Clinical Laboratory Improvement Act (CLIA), which ensures that testing procedures are performed according to professional standards and guidelines, have not been established for saliva testing. Laboratories that offer saliva tests may be certified by the CLIA, but that certification is based on the proficiency of the serum

testing procedures also provided. In addition, performing saliva testing is technically demanding and challenging. As a result, the number of laboratories capable of offering that type of evaluation is limited.

Although some saliva test kits are advertised in women's magazines, I caution against their use. To ensure accurate results, the staff of a laboratory that performs saliva testing should include a certified medical director and a laboratory director. Proof of reliability and expertise in saliva testing should be provided, and knowledgeable medical and support staff should be available to consult with physicians and other women's health providers if necessary.

Fortunately, a multidisciplinary interest in women's health is increasing among healthcare providers, and some pharmacists and mental health providers are now including a hormone profile based on saliva testing as part of their routine care for women patients.