

Salivary Testing of Hormone Levels

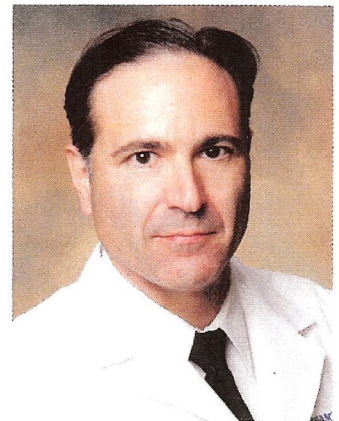
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Hormones such as estrogen, progesterone, and testosterone are steroid molecules. Whether produced in the body or having arrived in the form of Bio-Identical hormonal replacement therapy, these molecules ultimately must cross from the blood stream and enter into the cells of a given organ, such as the bone, heart, brain, breast, or uterus, in order to exert an effect on bodily function. Being fat soluble, the steroid hormone molecule is readily able to diffuse across cell membranes. Once inside the cell, the hormone is transported into the nucleus where it ultimately wields its biological influence. In order to circulate in the serum of the blood stream, which is water based, the hormone molecule must attach itself to a water-soluble carrier molecule. These water-soluble carrier molecules are proteins. The primary carrier protein for the sex steroid molecules is called Sex Hormone Binding Globulin (SHBG). When traveling the blood stream bound to SHBG, a hormone molecule is unable to cross cell membranes, and is rendered inactive, and is in reserve. In the body only one percent to two percent of sex steroid hormone is in the free or active state, while 98 percent to 99 percent of sex steroid hormone is bound to its protein carrier, and is in reserve. Thus SHBG acts not only as a transporter, but also as a reservoir for the sex steroid hormones.

Just as only free unbound steroid hormone molecules cross the cellular membranes of the various body organs such as the bones, heart, brain, uterus, and breast, so it is with the salivary glandular membrane; only free-unbound hormone will cross

the cellular membrane of the salivary gland and enter into the saliva. Thus if saliva is collected and hormone levels are measured, the result should provide a direct reflection of the level of active intracellular hormone in the body. While blood levels represent the total hormone content of the body, including SHBG-bound hormone reserves, it is the intracellular hormone levels which are most useful to ascertain. Salivary measurement allows us a window into the cell with regard to hormone levels, and therefore can provide us with this significant information.

Furthermore, because there is continuous fluctuation in SHBG levels, blood level measurements of sex steroid hormones can be misleading. Consider the following: SHBG levels are elevated in women who eat healthy diets, low in fat and starch content, who exercise regularly, and lose



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weight. With more SHBG in circulation, additional hormone will bind, and blood hormone levels in such patients will measure high. The clinician will be tempted to under treat, or to withhold treatment in such a patient, while in fact, intracellular hormone levels are low. Conversely, SHBG levels are lowered in women who eat generally unhealthy diets, high in fat and starch, who do not regularly exercise, and gain weight. Blood hormone levels checked in these patients will be low. The clinician may be tempted to over treat such a patient, when indeed her intracellular hormone levels are high. While blood level measurement may be of academic interest, it is most prescient, when tailoring a patient's postmenopausal hormone replacement regimen, to determine salivary levels.

FOR WHOM AND WHEN TO TEST SALIVARY LEVELS?

We are selective when recommending salivary testing because the cost of the test is between \$125 - \$150, and is rarely covered by the patient's insurance plan. When we test, we measure salivary levels of estradiol, estriol, estrone, testosterone, and progesterone. Levels of synthetic progestins, such as MPA (Provera), Premarin (a combination of estrogens derived from equine urine), and the synthetic

estrogen and progestins in oral contraceptive pills are not detected with conventional blood testing or salivary testing. Therefore, if a woman presents well on Premarin, or while on a synthetic HRT, or if she is not on HRT, there is no use in checking salivary hormone levels. After she has been on a Bio-Identical hormonal replacement therapeutic regimen for several months, salivary hormone levels then can be measured. It is particularly useful to check levels if the patient is not achieving her desired clinical effect, or if she is having adverse symptoms. Certainly, levels may be checked at any time if the patient so desires, if she does not mind incurring the expense. Therapeutic adjustments are then based on the results of salivary hormone testing, while always considering the patients symptoms.

Dr. Barry Schlafstein is a board certified Obstetrician / Gynecologist. He completed his internship and residency training at The Johns Hopkins Hospital in Baltimore, Maryland. His special interests include menopausal hormone replacement, minimally invasive gynecologic and pelvic reconstructive surgery, and female urinary incontinence. He instructs gynecologic and urologic surgeons nationally. Dr. Schlafstein can be reached at 912-355-5755.