

## OBESITY TREATMENT: TESTS USED TO ASSESS METABOLISM, APPETITE AND ENERGY CONTROL HORMONES

Tests	Significance	Treatment
<b>TSH</b>	Main screening test to assess thyroid function.	Treatment depends on whether thyroid function is high or low.
<b>Free T4 and Free T3</b>	T3 is the active form of thyroid hormone. T4 has to be converted to T3 to be functional. Conversion of T4 to T3 is suboptimal in certain conditions, such as obesity, low calorie diets, ageing, severe illnesses.	Hypothyroidism is treated with T4 thyroid hormone replacement therapy.  In the setting of poor conversion of T4 to T3, a combination of T4+T3 hormone replacement therapy might need to be used.
<b>Cortisol</b>	AKA "stress hormone". Levels increase in response to physical, psychological, environmental stressors. Obesity has been associated with higher cortisol production. Higher cortisol levels promote carbohydrate and/or fat cravings: "comfort food". Cortisol also promotes fat accumulation (preferentially in organs) and slower metabolism. Elevated cortisol levels can also affect action of leptin in the brain (hypothalamus), leading to increased food intake and decreased metabolism. High cortisol inhibits: <ul style="list-style-type: none"> <li>• Sex-hormones: lead to osteoporosis, and central adiposity</li> <li>• Thyroid hormones: lead to slower metabolism</li> <li>• Growth hormone: lead to central adiposity and affects lean body mass</li> </ul>	Stress management. Behavioral counseling to help control cravings.
<b>Testosterone</b>	Main male hormone produced in testicles. Also produced in the adrenal glands and ovaries. Increased production in adrenal glands and ovaries has been reported in setting of high insulin/insulin resistance, and is a feature of polycystic ovarian syndrome. Obesity can induce low levels of testosterone due to increased conversion of testosterone to estrogen in fat tissue.	Healthy weight loss, and testosterone replacement therapy when appropriate.
<b>Sex-hormone Binding Globulin (SHBG), Dehydroepiandrosterone-Sulfate (DHEA-S), FSH, LH, Estrogens</b>	Used to diagnose and follow up polycystic ovarian syndrome, which affects 5-10% of women of reproductive age, associated with insulin resistance, and is associated with increased risk of type 2 Diabetes and CV disease. SHBG production is decreased by high insulin levels.	