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Giving Testosterone Levels a Boost (Part 3)

A three-step exercise / nutrition protocol to maximize health.

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Step 1: Eat a Low-Glycemic, Antioxidant-Rich Diet

Since testosterone and insulin status are inversely correlated,[1-10] it's important to keep insulin low so testosterone will remain high. Understanding the Glycemic Index (i.e. which foods raise glucose and insulin concentration, and which foods don't) becomes an important key to managing and boosting healthy testosterone.[11-12]

Patients often ask, "What is a high Glycemic Index (GI) food?" A good answer is, "Any food that spikes/increases insulin and blood sugar is a high GI food." Table sugar (sucrose), for example, and anything that contains it will rank high on the GI scale. Foods made with refined flour and processed grains (white bread, pasta, white rice) or high GI sweeteners (such as honey, corn syrup) will spike blood sugar as well.[13-14]

Conversely, whole foods, including most fruits and vegetables (with the exception of white potatoes), have a much milder impact on blood sugar and insulin. As examples: low-GI foods (such as chickpeas, lentils and barley; leafy greens like spinach and lettuce; and fibrous vegetables like broccoli, cauliflower and asparagus) produce very small increases in plasma glucose and insulin concentrations.[13-14]

Reducing the glycemic index of an individual's diet for just four days,[16] seven days[17] or 12 weeks,[18] produces an increase in the individual's insulin sensitivity and a decrease in the fasting plasma insulin concentration. This means that in as few as 4-7 days, an individual can improve insulin sensitivity and decrease insulin levels, and thus generate the internal chemistry that encourages healthy increases in testosterone production.

Eat more antioxidant-rich foods: Free-radical production (a deficiency in antioxidant status or an excess of oxidative stress) ties right into healthy testosterone, as emphasized in this quote: "Aging is accompanied by reduced expression of anti-oxidants in Leydig cells leading to excessive oxidative stress and enhanced oxidative damage (lipid peroxidation). It is postulated that such excessive oxidative insult may contribute to the observed age-related decline in testosterone secretion by testicular Leydig cells."[19]

In other words, testosterone is tied directly to healthy antioxidant status of Leydig cells in the testes.[19] Thus, significantly increasing consumption of dietary antioxidants and nutritional supplements that deliver potent antioxidant protection from free radicals is another key to increasing testosterone. (For this purpose, be sure to see the many benefits of astaxanthin and pomegranate extract in step #3 below).

Step 2: Exercise With Intensity

A single bout of high-intensity exercise (cycling,[20-25] running[25-26]) to exhaustion or near-exhaustion produces an immediate short-term increase in whole-body insulin sensitivity in healthy, untrained men. For example, when men exercised on a cycle ergometer for 30 minutes at a high-intensity workload, post-exercise insulin sensitivity was significantly greater than pre-exercise insulin sensitivity.[20]

Conditioning regimens as short as seven days are effective.[27-28] However, make a note: The exercise-induced increase in insulin sensitivity is negated or abolished in overweight men who continue to consume high-GI diets.[26,29] So, diet and exercise work hand in hand to decrease insulin and set the stage for increases in healthy testosterone.

Exercise increases testosterone (and cortisol): A number of experiments have examined the simultaneous acute effects of an exercise bout on cortisol and testosterone physiology in men. In these experiments, a single session of moderate- to high-intensity exercise (weightlifting,[30-31,34-39] jump squats,[34] rowing,[37] swimming,[37] cycling[32-33]) to exhaustion or near-exhaustion produced immediate short-term increases in serum cortisol and both total and free testosterone concentrations,[30,37,39] in healthy untrained[30-34,38,39] and exercise-trained men.[35-37]

Step 3: Take Specific Nutritional Supplements

Science clearly shows that excess cortisol is the enemy of testosterone. If a man is psychologically stressed (stress at home, work, finances, family, etc.) or physically stressed (as with physical work or exercise), excess cortisol derails his ability to generate healthy increases in testosterone.

As you've seen, diet and exercise are the first two foundational steps to create the environment for healthy, abundant testosterone to be produced. In addition, there's a third factor that can naturally control aromatase and excess cortisol, and increase testosterone: a group of targeted, science-based nutritional supplements.

1. *Phosphatidylserine reduces the "stress response," decreases cortisol and increases testosterone:* Phosphatidylserine (PS) has been shown to attenuate (reduce) the endocrine responses to exercise-induced or psychological stress. As examples, daily supplementation with PS suppressed the spikes in serum concentrations of ACTH and cortisol that accompanied the initiation of cycling exercise in healthy, young, physically conditioned men[40-45] and that followed exposure to acute psychological stress in healthy, young men and women.[41-42]

In a double-blind, randomized, placebo-controlled trial, healthy young men supplemented their diets with either placebo or PS.[46] Compared to the lack of effect of placebo, 10 days of dietary supplementation with PS significantly suppressed the cycling-induced elevations in serum cortisol concentrations that were apparent in the men in the placebo group. In addition, pre-exercise serum total testosterone concentrations were on average 37 percent greater, and pre-exercise serum cortisol concentrations were on average 35

percent lower, after just 10 days of PS supplementation.

Together, these findings[40-46] indicate that supplemental PS interacts with neuronal cell membranes within the human brain to blunt the pituitary ACTH secretory response to hypothalamic stimuli, attenuating (reducing) the secretion of cortisol at rest and during and after exercise,[47] and releasing the testicular Leydig cells from cortisolemic inhibition of testosterone synthesis and secretion. Based on these benefits, the recommended dosage is 300 mg PS with lunch and dinner (600 mg/day of PS).

2. Astaxanthin: a premier antioxidant powerhouse: Astaxanthin is a red carotenoid pigment belonging to the xanthophyll class of carotenoids found in salmon, crabs and shrimp.[34] Astaxanthin exhibits free-radical-quenching potency that is about 100-fold greater than the antioxidant potency of vitamin E[48-50] and approximately 6,000 times the potency of vitamin C.[49]

Just 5 mg of oral astaxanthin produces significant increases in the plasma astaxanthin concentration within one hour in men and women.[51] After supplementing their diets for three weeks[51] or 12 weeks[52] with 20 mg of astaxanthin daily, two groups of overweight men and women exhibited significant reductions in plasma concentrations of whole-body cellular lipid peroxidation and significant increases in measured total circulating antioxidant capacity.

To date, science shows that astaxanthin is a powerful biological antioxidant within the human body.[48-57] The recommended dose is 4-6 mg of astaxanthin twice a day (8-12 mg/day).

3. The amazing pomegranate: potent antioxidant and anti-aromatase activity: Pomegranate juice, fruit and their extracts contain a large number of phytonutrient compounds, especially punicalagins and ellagitannins.[58-62] Punicalagins and ellagitannin metabolites enter the digestive system, where microbial enzymes convert them into a number of smaller, ultra-active "urolithin" metabolites that pack a potent antioxidant and anti-aromatase punch.[58,64-68]

The publicly available scientific evidence shows that pomegranate juice and extracts are "strong" inhibitors of aromatase,[65,71] and by inhibiting aromatase, pomegranate juice and extracts can contribute to the maintenance of healthy circulating testosterone and estradiol concentrations.[69,70] Based on these benefits, take 400-500 mg pomegranate extract twice a day (800-1,000 mg/day).

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