NATURAL WAYS TO COMBAT TESTOSTERONE LOSS

Andropause—caused by a decrease in bioavailable testosterone and rising estrogen—is a potentially troublesome time in a man's life. In contrast to mainstream medicine's apparent indifference to the debilitating effects of the aging process, those of us in the anti-aging field know there are numerous ways in which men can combat many of the deleterious aspects of an imbalance in their hormones, especially testosterone and estrogen. While multiple studies have proven that testosterone supplementation can ease or even reverse many symptoms of andropause, some men still may be leery of using testosterone until it is given mainstream medicine's "stamp of approval." For those men and others who wish to optimize their testosterone levels as they age, below are some specific recommendations to help maintain optimal testosterone levels, combat the debilitating effects of andropause, and live life to the fullest whether you are 40 or 90 years of age.

1. Physical exercise increases testosterone levels.

Multiple studies have shown that regular, high-intensity exercise keeps a man's testosterone at optimal levels. A 1999 study examined how the effects of heavy resistance training in both young (23 to 35 years old) and older (58 to 65 years old) men affected their testosterone levels.20 Both groups saw a statistically significant increase in testosterone levels after exercise. A more recent study published in 2001 also showed that strength training in middle-aged (44 to 48 years old) men increased levels of free testosterone.21

2. Protein combats SHBG, helps maintain optimal testosterone levels.

While adequate protein consumption is vital to maintaining muscle mass in both men and women, it is also important in maintaining testosterone levels. A study published in 2000 examined the relationship between diet and SHBG, and found that "diets low in protein in elderly men [40-70 years old] may lead to elevated SHBG levels and decreased testosterone availability. The decrease in bioavailable testosterone can then result in declines in sexual function and muscle and red cell mass, and contribute to the loss of bone density."22

3. Soy and fish oil keep estrogen and SHBG in check.

Elderly men often see an increase in unhealthy levels of SHBG and estrogen via activity of the aromatase enzyme, which can lead to a net decrease in testosterone levels. Two recent Japanese studies have shown some natural ways in which men can help tilt the ratio back in favor of testosterone. One study of 97 middle-aged to elderly men found that men with high levels of soy intake had lower levels of estradiol (a form of estrogen) compared to men with lower levels of soy intake.23 The researchers postulated that this beneficial inverse relationship could be due to inhibition of the aromatase enzyme by soy and soy-based food products. Another Japanese study examined how the essential fatty acids EPA and DHA (found in high concentrations in fish) affected SHBG levels in men 43 to 88 years of age.24 After controlling for other variables, the researchers concluded that both EPA and DHA decreased levels of SHBG in middle-aged and elderly men.

4. Indole-3-carbinol protects against high estrogen levels, prostate cancer.

An adequate intake of indole-3-carbinol (I3C), through vegetables such as broccoli, brussels sprouts, and cabbage, or via supplements, may prove to be very helpful for aging men in both keeping estrogen levels in check and decreasing their risk of prostate cancer. Studies have demonstrated that I3C increases the ratio of 2-hydroxyestrone to 16-alpha-hydroxyestrone, thereby causing a decrease in the "bad" estrogen and an increase in the "good" estrogen. For men, this very well might mean a decrease in prostate cancer. In a recent study that examined the association of prostate cancer risk with estrogen metabolism, the authors noted "results of this case-control study suggest that the estrogen metabolic pathway favoring 2-hydroxylation over 16-alpha-hydroxylation may reduce risk of clinically evident prostate cancer."25

5. Zinc is essential for optimal testosterone production.

One supplement that should be considered absolutely essential for maintaining a man's testosterone levels is zinc. This busy mineral is involved in almost every aspect of male reproduction, including testosterone metabolism, sperm formation, and sperm motility. Multiple studies have demonstrated the effectiveness of zinc in treating male infertility due to low.
testosterone levels.\textsuperscript{26,27} A prime example of the usefulness of zinc was illustrated in a study of 37 infertile men with decreased testosterone levels and associated low sperm counts.\textsuperscript{28} The men were given 60 mg of zinc daily for 45-50 days. In 22 patients, testosterone levels significantly increased and mean sperm count rose from 8 million to 20 million.

6. **Chrysin is a natural aromatase inhibitor.**

A bioflavonoid called chrysin has shown potential as a natural aromatase inhibitor.\textsuperscript{29,31} Bodybuilders have used chrysin as a testosterone-boosting supplement because by inhibiting the aromatase enzyme, less testosterone is converted into estrogen. The problem with chrysin is that because of its poor absorption into the bloodstream,\textsuperscript{32} it has not produced the testosterone-enhancing effects users expect. In a Pilot study with 10 male subjects, it was found that when chrysin is combined with piperine, reductions in serum estrogen (estradiol) and increases in total and free testosterone result in 30 days. In a study published in the *Journal of Steroid Biochemical Molecular Biology* (1993), chrysin and 10 other flavonoids were compared to an aromatase-inhibiting drug (aminoglutethimide).\textsuperscript{30} Chrysin was shown to be the most potent aromatase inhibitor, and was similar in potency and effectiveness to the aromatase-inhibiting drug. Chrysin is not a patentable drug, so do not expect to see a lot of human research documenting its effects. Many FDA-approved drugs (such as Arimidex\textsuperscript{32}) inhibit aromatase, and there is not much financial incentive for finding natural ways to replace these drugs. While prescription aromatase-inhibiting drugs are relatively free of side effects, aging men who are seeking to gain control over their sex hormone levels sometimes prefer natural sources instead of trying to convince a physician to prescribe a drug (such as Arimidex\textsuperscript{32}) that is not approved by the FDA as an anti-aging therapy. (Arimidex\textsuperscript{8} is prescribed to estrogen-dependant breast cancer patients to prevent testosterone and other hormones in the body from converting, i.e., aromatasing, into estrogen.)

7. **Nettle root liberates “bound” testosterone.**

Testosterone that becomes bound to serum globulin is not available to cell receptor sites and fails to induce a libido effect. When testosterone binds to sex hormone binding globulin (SHBG), it loses its biological activity and becomes bound testosterone, as opposed to the desirable free testosterone. As men age past 45, SHBG’s binding capacity increases dramatically—by an average of 40%—and coincides with age-associated loss of libido and other andropause symptoms. Some studies show that the decline in sexual interest with advancing age is not always due to the amount of testosterone produced, but rather to the increased binding of testosterone to globulin by SHBG. This explains why some older men who are on testosterone replacement therapy do not report a long-term aphrodisiac effect. That is, the artificially administered testosterone becomes bound by SHBG and is not bioavailable to cellular receptor sites where it would normally produce a libido-enhancing effect. European researchers have identified constituents of nettle root that bind to SHBG in place of testosterone, thus reducing SHBG’s binding of free testosterone.\textsuperscript{33,37} As the authors of one study stated, these constituents of nettle root “may influence the blood level of free, i.e., active, steroid hormones by displacing them from the SHBG binding site.”

8. **Human Studies Using Combination Nutrients**

To ascertain the safety and efficacy of nutrients that are purported to modulate male hormone levels, the Life Extension Foundation sponsored clinical studies to assess the effects of specific supplements on blood levels of testosterone, estrogen, SHBG, etc.\textsuperscript{39} Based on the results of these studies, a formula called Super MiraForte was developed that combines chrysin, nettle root, muira puama, piperine, and other nutrients that showed the most potent effects in boosting free testosterone and suppressing estrogen in aging men. For those who would prefer to avoid testosterone-boosting and estrogen-suppressing drugs, four capsules a day of Super MiraForte may be considered. Before embarking on a hormone rejuvenation program, please refer to the Male Hormone Modulation protocol that can be accessed at www.lef.org/test For information about Super MiraForte, refer to the next page.