

TABLE 7e-1 ASSOCIATION OF TESTOSTERONE LEVELS WITH OUTCOMES IN OLDER MEN

1. Positively associated with:
• Muscle mass and muscle strength
• Physical function
• Sexual desire
• Bone mineral density, bone geometry, and volumetric bone mineral density
2. Negatively associated with:
• Coronary artery disease
• Visceral fat
• Diabetes mellitus
• Metabolic syndrome
• Mortality
• Falls and fracture risk
• Frailty
3. Not associated with:
• Lower urinary tract symptoms
• Erectile dysfunction
• Dementia
• Major depression

strategies vary for each class of sexual disorder. Historically, the classification and nomenclature for sexual disorders used criteria identified in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), based on the erroneous belief that sexual disorders in men are largely psychogenic in their origin. However, the recognition of erectile dysfunction as a manifestation of systemic disease and the availability of easy-to-use oral selective phosphodiesterase-5 inhibitors have placed sexual disorders in men within the purview of the primary care provider.

MUSCLE DYSMORPHIA SYNDROME IN MEN: A BODY IMAGE DISORDER

Muscle dysmorphia is a form of body image disorder characterized by a pathologic preoccupation with muscularity and leanness. The men with muscle dysmorphia express a strong desire to be more muscular and lean. These men describe shame and embarrassment about their body size and shape and often report adverse symptoms such as dissatisfaction with appearance, preoccupation with bodybuilding and muscularity, and functional impairment. Patients with muscle dysmorphia also report higher rates of mood and anxiety disorders, as well as obsessive and compulsive behaviors. These men often experience impairment of social and occupational functioning.

Patients with muscle dysmorphia syndrome—nearly all men—are almost always engaged in weightlifting and body building and are more likely to use performance-enhancing drugs, especially anabolic-androgenic steroids. Muscle dysmorphia disorder predisposes men to an increased risk of disease due to the combined interactive effects of the intensity of physical exercise, the use of performance-enhancing drugs, and other lifestyle factors associated with weightlifting and the use of performance-enhancing drugs. No randomized trials of any treatment modalities have been conducted; anecdotally, behavioral and cognitive therapies have been tried with varying degrees of success.

Anabolic-Androgenic Steroid Abuse by Athletes and Recreational Body-Builders

The illicit use of anabolic-androgenic steroids (AAS) to enhance athletic performance first surfaced in the 1950s among powerlifters and spread rapidly to other sports and to professional as well as high school athletes and recreational bodybuilders. In the early 1980s, the use of AAS spread beyond the athletic community into the general population. As many as 3 million Americans, most of them men, have likely used these compounds. Most AAS users are not athletes, but rather recreational weightlifters who use these drugs to look lean and more muscular.

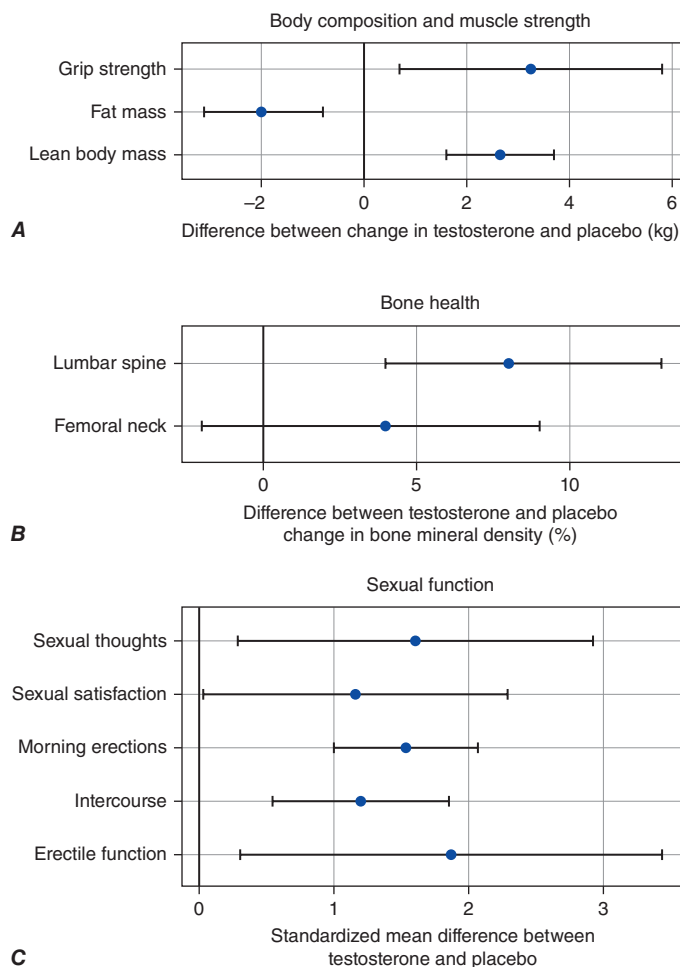


FIGURE 7e-2 The effects of testosterone therapy on body composition, muscle strength, bone mineral density, and sexual function in intervention trials. The point estimates and the associated 95% confidence intervals are shown. **A.** The effects of testosterone therapy on lean body mass, grip strength, and fat mass in a meta-analysis of randomized trials. (Data derived from S Bhasin et al: *Nat Clin Pract Endocrinol Metab* 2:146, 2006.) **B.** The effects of testosterone therapy on lumbar and femoral bone mineral density in a meta-analysis of randomized trials. (Data derived from a meta-analysis by MJ Tracz et al: *J Clin Endocrinol Metab* 91:2011, 2006.) **C.** The effects of testosterone therapy on measures of sexual function in men with baseline testosterone less than 10 nmol/L (290 ng/dL). (Data derived from a meta-analysis by AM Isidori et al: *Clin Endocrinol (Oxf)* 63:381, 2005.) (Reproduced with permission from M Spitzer et al: *Nat Rev Endocrinol* 9:414, 2013.)

The most commonly used AAS include testosterone esters, nandrolone, stanozolol, methandienone, and methenolone. AAS users generally use increasing doses of multiple steroids in a practice known as stacking.

The adverse effects of long-term AAS abuse remain poorly understood. Most of the information about the adverse effects of AAS has emerged from case reports, uncontrolled studies, or clinical trials that used replacement doses of testosterone (Table 7e-2). Of note, AAS users may administer 10–100 times the replacement doses of testosterone over many years, making it unjustifiable to extrapolate from trials using replacement doses. A substantial fraction of AAS users also use other drugs that are perceived to be muscle-building or performance-enhancing, such as growth hormone; erythropoiesis-stimulating agents; insulin; and stimulants such as amphetamine, clenbuterol, cocaine, ephedrine, and thyroxine; and drugs perceived to reduce adverse effects such as human chorionic gonadotropin, aromatase inhibitors, or estrogen antagonists. The men who abuse AAS are