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A definitive role of testosterone in erectile function has been controversial; however, recent evidence is becoming available which substantiates a key function for this hormone. Testosterone deficiency is associated with a decline in erectile function and testosterone levels are inversely correlated with increasing severity of erectile dysfunction. Erectile dysfunction can be caused by multifactorial pathologies. In particular, erectile dysfunction may be the first symptom of cardiovascular disease. Animal studies have demonstrated that castration causes vascular smooth muscle cell atrophy, venous leakage, adipocytes in the subtunical space, loss of elastic fibers and increase in collagen deposition. Testosterone increases the expression of nitric oxide synthase and phosphodiesterase type 5, both principal enzymes involved in the erectile process. Testosterone replacement alone in hypogonadal men can restore erectile function. A significant proportion of men who fail to respond to a PDE5 inhibitor are testosterone deficient. Testosterone replacement therapy can convert over half of these men into phosphodiesterase type 5 responders. It is now recommended that testosterone levels should be assessed in all patients with erectile dysfunction.