



RESEARCH ARTICLE

Testosterone: Strong Enough for a Man, but Made for a Woman

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ABSTRACT

Testosterone, the most abundant biologically active hormone in women, has been historically and erroneously characterized as a “male hormone,” resulting in a longstanding gap in women’s healthcare. This misconception has led to the under recognition and undertreatment of androgen deficiency in women, despite its broad physiologic importance. Throughout a woman’s lifespan, testosterone levels are 10–20 times higher than estradiol levels, making testosterone the predominant sex hormone in female physiology. Declines in testosterone with aging contribute to symptoms often misdiagnosed as mood or pain disorders, including fatigue, anxiety, cognitive decline, musculoskeletal weakness, sexual dysfunction, and metabolic changes. Evidence demonstrates that physiologic testosterone replacement improves mood, energy, cognition, bone and vascular health, and sexual function, with minimal risk of virilization when appropriately dosed. Contrary to earlier beliefs, testosterone therapy has not been associated with increased breast cancer risk; instead, mounting data suggest protective effects. A 9-year retrospective study of 2,377 women treated with testosterone or testosterone/estradiol pellet implants showed a 35.5% reduction in invasive breast cancer incidence compared with age-matched SEER rates, supporting testosterone’s antiproliferative and anti-estrogenic actions on breast tissue. Additional studies indicate potential benefits of testosterone therapy in reducing breast cancer recurrence and improving quality of life in survivors. Despite extensive evidence supporting its safety and efficacy, the U.S. Food and Drug Administration has yet to approve a testosterone formulation for women, a gap that contrasts with clinical practice in Europe and Australia. Recognition of testosterone deficiency as a legitimate medical condition in women, and implementation of evidence-based guidelines for its management, are urgently needed. Addressing this issue requires improved physician education, updated clinical protocols, equitable insurance coverage, and regulatory approval of female-specific testosterone therapies. Reframing testosterone as a hormone vital to both sexes, rather than exclusively “male,” is essential for optimizing women’s health, longevity, and overall quality of life.

Introduction: The Misguided Perception of “Male” Hormones

For decades, the medical community has perpetuated a fundamental misunderstanding about human hormones, particularly testosterone. This powerful hormone has been branded as the quintessential “male hormone,” while estrogen earned the title of “female hormone.” This oversimplified binary thinking has created a dangerous gap in women's healthcare, leaving millions of women without access to treatments that could dramatically improve their quality of life.

The irony of this article's title—a playful twist on a popular deodorant's famous advertising slogan—highlights a profound medical contradiction. While a consumer goods company manufacturing personal care products boldly claimed their deodorant was “strong enough for a man, but made for a woman,” the medical establishment has done precisely the opposite with testosterone, denying women access to a hormone that is, scientifically speaking, the most abundant biologically active hormone in women's bodies. Throughout a woman's lifespan, testosterone levels are tenfold higher than estradiol levels, making it the predominant sex hormone in female physiology.¹ Pre-menopausal women often have testosterone levels that are 15-20-fold higher than their estradiol levels.¹

This perpetuated and largely accepted idea that testosterone is a male hormone, highlights the critical oversight in women's healthcare in the United States, especially as women age and their hormones naturally decline. Even though clinical use of testosterone dates back to 1939, and since then, the medical community in Europe and Australia routinely uses testosterone therapy for women as an essential element of hormone replacement therapy (HRT), the United States is slow to adopt this practice.²

Additionally, early research suggested that testosterone therapy for women would increase the instances of breast cancer. More recent studies indicate the opposite, even concluding that in many instances, testosterone therapies have been protective against certain types of breast cancers.^{1,3} Despite the data that indicates a myriad of potential health benefits (including the protection or reduction of breast cancers), the FDA has yet to approve any type of testosterone therapy for women.³⁻⁹

As a result, the majority of women are not getting the level of hormonal healthcare they need as they age, and are unknowingly forfeiting potential long-term benefits of testosterone therapy with regard to their overall health and longevity. Ultimately, testosterone therapy should be considered not only for symptom relief during perimenopause, but also as part of a holistic preventive therapy for women's long-term health and wellness.

The Biological Reality: Testosterone's Critical Role in Women's Health

Testosterone and pro-androgens decline gradually with aging in both sexes, and women may experience symptoms of androgen deficiency including dysphoric

mood, anxiety, irritability, depression, lack of well-being, physical fatigue, bone loss, muscle loss, changes in cognition, memory loss, insomnia, hot flashes, muscle and joint pain, insulin resistance and diabetes, weight gain, incontinence, as well as sexual dysfunction.¹ These symptoms are often recognized in men and treated with testosterone therapy, but in women they garner mood disorder or fibromyalgia diagnoses and resulting inappropriate prescriptions for antidepressants.

Debunking the “Masculinization” Myth: It has been widely recognized for the last six decades that the testosterone effect is dose dependent and that in lower doses, testosterone “stimulates femininity.” Physiologically appropriate doses of testosterone do not cause masculinization in women. Frequently, the most adverse side effect of testosterone therapy when effectively treating women for symptoms of perimenopause is a mild increase in facial hair growth and/or acne.¹ And women rarely forgo their hormone therapy because of either of these issues. The benefit of symptom relief comes from increased testosterone levels; essentially bringing women back to their own normal hormone levels before perimenopause.^{1,2}

Despite a lack of clear evidence to support relief of menopause symptoms, estrogen is more widely accepted as hormone replacement therapy for women.² This could be largely due to the fact that physicians do not have a clear understanding of the role of testosterone in women, aside from addressing low libido and sexual function. Furthermore, hormone levels may not adequately reflect symptoms of perimenopause, or their level of relief when using testosterone therapy to address women's symptoms.

Beyond sexual function, testosterone has been shown to positively affect brain, skin, bone, and vascular health in women. It also improves mood, energy levels, and body composition.^{2,3}

Most remarkably and underappreciated, the research reveals testosterone's protective effects against breast cancer. Women receiving bioidentical testosterone therapy demonstrated reduced breast cancer incidence compared to those not receiving treatment, suggesting testosterone provides protective benefits through its ability to oppose estrogen's proliferative effects on breast tissue. Taking this one step further, the research demonstrates that women with breast cancer who start testosterone pellets in conjunction with an aromatase inhibitor can markedly reduce their risk of reoccurrence of breast cancer and one compelling study showed that tumors shrink with the placement of testosterone pellets right into the tumor itself.¹⁻⁶

The evidence for testosterone's breast cancer protective effects has been further strengthened by one of the largest studies to date published in the European Journal of Breast Health in 2021.⁷ This groundbreaking 9-year retrospective study of 2,377 pre- and post-menopausal women treated with testosterone or testosterone/estradiol pellet implants. The study found a 35.5% reduction in invasive breast cancer incidence compared to age-specific SEER rates:⁷

- 144 cases per 100,000 person-years in the study
- 223/100,000 in age-matched SEER data
- 330/100,000 in the placebo arm of the Women's Health Initiative Study
- 312/100,000 in never-users from the Million Women Study

Importantly, the addition of estradiol did not increase breast cancer incidence over testosterone alone, challenging fears about estrogen therapy when used appropriately with testosterone. There is long-term data of up to 40 years to support the safety, tolerability, and efficacy of 50-225 mg doses of testosterone pellet implants in women who underwent hormone therapy.¹

Research also indicates that higher doses of testosterone used to treat breast cancer patients have been found to be safe.^{1,3} Plus, higher doses of testosterone implants correlate with a greater improvement in quality of life for women undergoing this therapy, including somatic, psychological, and urogenital symptoms, while simultaneously controlling certain types of breast cancer.^{1,3}

Studies validate pellet delivery superiority, demonstrating pellet therapy has an extremely high continuation rate of over 81%.⁷ “The physiology of testosterone implants allows more consistent steady state serum levels compared to other modalities, and as such the benefits in reducing [breast cancer] may not extend to oral or transdermal testosterone delivery methods.”⁷

A Call to Action: Transforming Women's Hormonal Healthcare

Many of the issues hindering women's access to the much biologically needed testosterone are due to dogmatic conventional wisdom. It is time we dispel the most common myths.

- Myth: Testosterone is a predominantly male hormone - Reality: Throughout a woman's life, testosterone is the most abundantly produced hormone. The medical establishment's focus on testosterone as a “male hormone” created gender bias in which research funding flows primarily toward studies in men, while women's hormonal needs have been ignored.
- Myth: Testosterone causes hair loss - Reality: No evidence supports this. Hair loss is a multifactorial process which is poorly understood.
- Myth: Testosterone causes aggression - Reality: Testosterone therapy decreases anxiety, irritability and aggression. Over 90% of patients reported less irritability.¹
- Myth: Testosterone causes heart problems - Reality: Substantial evidence shows testosterone is cardio-protective.¹¹
- Myth: Testosterone causes liver damage - Reality: Non-oral testosterone doesn't adversely affect the liver.
- Myth: Testosterone increases breast cancer risk - Reality: Multiple large-scale studies demonstrate

testosterone is breast protective. Clinical studies in primates and in vitro evidence suggest that testosterone-androgen receptor complex is anti-proliferative that counteracts the stimulatory effects of estrogen. Testosterone-androgen receptor complexes downregulate estrogen receptors, are antiproliferative, and increase apoptosis of breast cancer cell lines.^{8,9}

Meaningful change requires coordinated efforts:

Improved Physician Education: Medical schools must incorporate comprehensive training on women's hormonal health. Physicians need to understand testosterone deficiency is a legitimate medical condition deserving treatment, not dismissal.

Updated Clinical Guidelines: Professional organizations must revise guidelines to reflect current evidence, providing clear recommendations for identifying candidates and protocols for safe treatment.

Enhanced Research Funding: Government agencies must prioritize research into women's hormonal health. The systematic exclusion of women from clinical trials created an artificial data gap now used to justify withholding treatment.

FDA Approval of Women's Testosterone Products: The regulatory pathway must be streamlined. The FDA's failure to approve a testosterone product for women continues adversely affecting women's health.

Insurance Coverage: Healthcare insurers must recognize testosterone therapy as legitimate medical treatment. The current system covering testosterone for men while denying it for women represents clear gender discrimination.

Public Awareness: Women need education about testosterone's role in their health and empowerment to advocate for appropriate treatment.

Protecting Physician Autonomy: The medical community must resist restrictive certification requirements that would limit physicians' ability to prescribe testosterone therapy for women.

The time has come to abandon the outdated notion that testosterone is a “male hormone” and recognize it as a crucial component of optimal health for all humans. Women deserve access to safe, effective testosterone therapy, and the medical community has a responsibility to provide it.

The evidence is clear, the need is urgent, and the time for action is now. Women have waited too long for recognition of their hormonal health needs. It's time to ensure that testosterone therapy—strong enough for a man but made for a woman—becomes readily available to all who need it.

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