Optimal Prostate Defense Requires a Multi-Modal Strategy

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As an aging man, your odds of suffering benign prostate enlargement (BPH) and/or prostate cancer are exceedingly high.

BPH will afflict 50% of men over the course of their lives. At advanced stages, BPH can almost completely obstruct the urethral canal, leading to a host of lower urinary tract symptoms.

Prostate cancer remains the second leading cause of cancer death in men, accounting for more than 28,000 deaths and 186,000 new cases in 2008 alone.

This article reviews eight clinically supported interventions with outstanding safety records to protect prostate health.

Saw Palmetto—Front Line Defense!

Used by over 2 million men in the United States, saw palmetto (Serenoa repens) remains the front line fighter in natural prostate defense, with a substantial body of clinical investigation and support. Extracts from the ripe red berries of the plant are rich in bioactive plant-based compounds, including beta-sitosterol and a host of vital free fatty acids.

The natural ingredients in saw palmetto benefit the prostate in several related ways. They inhibit enzymes that convert testosterone into dihydrotestosterone (DHT), a hormone that increases prostate growth and may promote cancer. They bind to DHT receptors on prostate cells, further reducing DHT’s potential negative impact.

These multiple mechanisms account for saw palmetto’s therapeutic effects in managing BPH. In a summary of 18 clinical trials involving 2,939 men, saw palmetto alleviated lower urinary tract symptoms (LUTS) and urine flow measures more effectively than placebo.

The analysis also indicated additional benefit by combining saw palmetto with other phytonutrient extracts, including nettle root and bark of the African plum tree Pygeum africanum.

When placed head-to-head against prescription drugs like finasteride (Proscar®) and tamsulosin (Flomax®), saw palmetto was as effective in improving urinary symptom scores and peak urinary flow rates. Of even greater interest, men given saw palmetto experienced a lower incidence of associated sexual dysfunction compared to those given pharmaceuticals!

In fact, few adverse effects have ever been confirmed with saw palmetto extract.
Adverse prostate conditions will affect at least half of all men after the age of 50, and 1 in 6 men will be diagnosed with prostate cancer during his lifetime—claiming as many as 28,000 lives each year in the United States.

- Technological advances in extraction techniques optimize the already well-known benefits of saw palmetto extracts.
- Saw palmetto extracts possibly fight BPH and prostate cancer by directly blocking hormone conversion in prostate tissue, and by modifying expression of genes that contribute to cancer development.
- A diverse array of complementary, natural interventions operate across multiple pathways to disrupt prostate diseases at every stage in their development.
- Both alone and in combination, they can be as effective as pharmaceuticals—without undesirable side effects, including sexual dysfunction.

The complex of plant-based chemicals (phytosterols) in the saw palmetto berry has been shown to exert a suppressive effect on prostate cancer cells. Saw palmetto’s high beta-sitosterol content—along with other constituents within its phytosterol complex—inhibit prostate cancer cell proliferation by selectively arresting cell growth and inducing programmed cell death (apoptosis).9,18,19 The carotenoids contained in saw palmetto also act in tandem with this phytosterol complex to attack cancer cell membranes and slow tumor growth.8,19,20 Despite these impressive findings, saw palmetto should not be considered a primary treatment for prostate cancer.

The Complementary Power of Nettle Root

In numerous studies, the root of stinging nettle (Urtica dioica) has been shown to exert favorable effects on prostate health that complement those of saw palmetto. Stinging nettle appears to modulate hormone activity in prostate tissue. It also possesses powerful anti-inflammatory and antimicrobial effects—with very low toxicity.24,25 Animal studies further indicate its ability to restrict prostate tissue growth.26

Controlled clinical research has demonstrated nettle extract’s power to counter and even reverse the effects of benign prostatic hypertrophy (BPH). In a double-blind, placebo-controlled study of 558 patients with BPH, nettle extract improved LUTS by 81%, compared with just 16% of controls.27 It also significantly increased peak urine flow rates compared with placebo.

When combined with saw palmetto, nettle root extract displays even more impressive effects on BPH. One large study found that the combination was as effective as the drug finasteride (Proscar®) at reducing symptom scores and increasing urine flow, but produced far fewer adverse events.28 Other studies have demonstrated the combination’s superior performance over placebo in trials lasting up to 96 weeks—with virtually no side effects.29
Nettle root extract may also fight prostate cancer, reducing cancer cell proliferation without affecting normal tissue.\textsuperscript{30} It blocks the enzymes that cancer cells need for rapid turnover.\textsuperscript{31} The \textit{lectins} in nettle root extract—proteins involved in cell recognition—display a preference for cancer cells over healthy ones, enhancing nettle root’s ability to attack malignant cells and induce production of the cancer-suppressing cytokine interleukin-2 (IL-2).\textsuperscript{32} As with saw palmetto, nettle root extract alone is not sufficiently effective to be used as a curative treatment for prostate cancer.

**Advanced Technology Preserves Saw Palmetto’s Bioactive Compounds**

The harsh chemical processes and low-pressure techniques often used to extract the saw palmetto berry’s bioactive ingredients paradoxically destroy many of them. An advanced high-pressure CO\textsubscript{2} extraction technology has been developed that delivers intact a far greater proportion of saw palmetto’s beneficial, high molecular-weight compounds. The result is a carotenoid-rich extract that most closely reflects the composition of mature saw palmetto berries compared to typical saw palmetto extracts. Carotenoids have demonstrated protective effects against various prostate disorders.\textsuperscript{21-23}

**Potent Prevention with Flax and Norway Spruce Lignans**

Plants evolved \textit{lignans} to defend against disease. As it happens, their health-promoting benefits are passed on to us when ingested.\textsuperscript{33} Resident bacteria in our colon convert these plant lignans into the mammalian lignan \textit{enterolactone}, a phytoestrogen that has been shown to suppress numerous cancers, particularly hormone-dependent types—including prostate and breast cancer.\textsuperscript{34-36} Lignans from flax, Norway spruce (\textit{Picea abies}), and other sources may help prevent both BPH and prostate cancer.

Recent studies have revealed that \textit{flax seed} lignan extract produces improvements in LUTS and quality of life, while also lowering plasma cholesterol and glucose concentrations.\textsuperscript{37,38}

The evidence for their preventive power against prostate cancer is equally compelling. Foods high in plant lignans are associated with lower prostate cancer risk.\textsuperscript{39} Enterolactone derived from dietary plant lignans has been shown to induce apoptosis (cell death) in cultured human prostate cells.\textsuperscript{40,41} In a clinical setting, flax seed-supplemented diets generated favorable reductions in tumor proliferation rates in men with prostate cancer in as little as 30 days.\textsuperscript{42} Lignans derived from the Norway spruce have demonstrated powerful anti-cancer effects in an animal model of human prostate cancer, including smaller tumor volume and increased apoptosis.\textsuperscript{43}
**Novel Boswellia Extract**

A novel extract from *Boswellia serrata*, also known as Indian frankincense, has demonstrated potential in prostate health protection.\(^{44}\) It acts as a powerful 5-lipoxygenase inhibitor. The enzyme 5-lipoxygenase (5-LOX) inflicts numerous adverse effects\(^ {45}\) that have been implicated in prostate cancer development. Boswellia extract also favorably modulates gene expression, powerfully suppressing production of pro-inflammatory cytokines involved in BPH and prostate cancer.\(^ {46,47}\) The anti-inflammatory effects of boswellia extracts have been demonstrated in human studies,\(^ {48}\) making it an attractive component of BPH prevention.

Research further indicates that boswellia is particularly effective in controlling proliferation of prostate cancer cells. Inhibitors of 5-LOX induce apoptosis in prostate cancer cells through the aptly-named “death receptors” that trigger cancer cell suicide.\(^ {49,50}\) This extract also blocks prostate cancer growth and proliferation in cell cultures.\(^ {51}\) These effects are due in part to its ability to decrease the androgen receptors that many prostate cancers require to survive.\(^ {52}\) Boswellia extracts also inhibit new blood vessel growth (angiogenesis), depriving malignant tissues of the nutrients and oxygen they need to metastasize.\(^ {53}\)

Saw palmetto extract is one of several natural compounds with clinically proven value in reducing symptoms of BPH and risk factors for prostate cancer.

**Pygeum Africanum**

The bark of the African plum tree, *Pygeum africanum*, contains powerful compounds that support the health of prostate and bladder tissue.\(^ {54}\) Pygeum extracts were proven effective against BPH in numerous open and placebo-controlled studies in the 1990’s, and pygeum is now recognized in Europe as a standard therapeutic option.\(^ {55}\) Pygeum and beta-sitosterol in doses of 50-100 mg twice daily improve lower urinary tract symptoms and significantly increase urine flow rates, while decreasing residual urine volume in the bladder that can lead to urinary tract infections.\(^ {56-59}\)

Pygeum extracts also appear to offset the sexual dysfunction that often accompanies BPH and results in overall improvement in quality of life.\(^ {60}\) One unique mode of action seems to be that pygeum extracts actually inhibit proliferation of the muscle and fibrous tissue in the prostate that help contribute to BPH in the first place.\(^ {61,62}\) Adverse effects associated with pygeum are rare and mild,\(^ {63}\) though some gastrointestinal upset has been reported.

Numerous studies have recently emerged demonstrating pygeum’s prostate cancer-fighting potential. Pygeum extracts block the male hormone (androgen) receptors that prostate cancer cells need to thrive.\(^ {64}\) As with the other chemoprotective compounds reviewed in this article, pygeum has been shown to inhibit cancer cell growth and proliferation, while stimulating desired apoptosis (programmed death of cancer cells).\(^ {65}\) And pygeum’s androgen-blocking constituents reduce cancer cells’ potential to invade healthy prostate tissue, reducing spread of dangerous tumors.\(^ {66}\)
Novel Flower Pollen Compound

Over two decades of research have confirmed that a specific compound of flower pollens, called cernitin, possesses unique effects on prostate tissue. It relaxes certain smooth muscle tissues in the urinary tract, thus potentially alleviating lower urinary tract symptoms associated with BPH. It has been shown to significantly alleviate symptoms of bladder obstruction in men with BPH, while reducing residual urine volume and shrinking the size of the prostate itself. One major study found cernitin worked as well as six prescription drugs commonly used for BPH.

Cernitin significantly decreased inflammatory cytokines and tissue inflammation in a rat model of nonbacterial prostatitis, a painful chronic condition that afflicts many men. This may render it an ideal candidate both for the management of BPH and for a complication of chronic prostatitis called chronic pelvic pain syndrome, which has proven difficult to treat with standard medication.

In 2009, a multicenter, randomized, double-blind, placebo-controlled study showed that cernitin significantly improved measures of pain and quality of life in men with category III prostatitis/chronic pelvic pain syndrome, a prevalent condition for which no standardized treatment exists. Overall prostatitis symptom scores were also significantly reduced compared with placebo, without major side effects. Higher doses of cernitin appear to provide faster relief of symptoms.

Symptoms of Benign Prostate Hypertrophy

- Urinary hesitancy
- Urinary retention
- Painful urination
- Frequent urination
- Urinary tract infections
- Ejaculatory dysfunction

Unique Mineral Protection

The trace element boron combats prostate cancer through a unique combination of underlying mechanisms. Calcium channel signaling is a major regulator of cancer cell proliferation, and yet has received little attention in cancer prevention. Higher boron levels in the blood lower the risk of prostate cancer by reducing intracellular calcium signals and storage. At normal concentrations, boron operates selectively, inhibiting prostate cancer cell proliferation while allowing healthy prostate cells to grow.

In animal models boron supplementation inhibited growth of human prostate cancer cells and reduced the size of implanted tumors, reducing local expression of a vital growth factor—a cancer-fighting mechanism unique to boron. Another study demonstrated that when combined with phytosterols, boron amplifies the suppression of cancer cell growth.

Several large human studies have shown that higher dietary boron intake lowers prostate cancer risk. In one study, men with the highest boron intake halved their prostate cancer risk compared to those with the least intake.
Highly-purified saw palmetto extracts benefit the prostate gland by blocking DHT production, regulating prostate cell growth. Compelling new evidence suggests that these same hormonal effects block and even partially reverse hair loss in men with common male pattern baldness!

In 2002, a group of leading-edge scientists recognized that saw palmetto’s DHT-blocking action might help in male pattern baldness. In a placebo-controlled, double-blind study, 60% of men receiving the active supplement showed significant improvement. A follow-up study suggests that in conjunction with specific anti-inflammatory compounds, saw palmetto may reduce expression of inflammatory genes in hair follicle cells, slashing hair loss risk.

The causes of male pattern baldness are complex. In addition to the shrinkage of hair follicles accelerated by higher DHT levels, sustained microscopic inflammation of hair follicles and remodeling of connective tissue may contribute to making hair loss permanent. Saw palmetto has demonstrated significant reduction of inflammatory markers. Thus, if used before hair loss is advanced, saw palmetto may be an option for addressing the underlying causes of male pattern baldness.

Lycopene

Lycopene is an antioxidant carotenoid found in tomatoes, watermelon, pink grapefruit, and guava. Multiple studies have found that higher intake of lycopene is associated with decreased cancer risk. It inhibits prostate cancer cell growth in culture, halting the reproductive cell cycle and inducing apoptosis. Lycopene possesses two unique chemopreventive features:

1. It interferes with internal sex hormone-regulated signaling among cancer cells to prevent coordinated growth.

2. It disrupts DNA synthesis in growing prostate cell cultures, but also protects healthy DNA from damage.
In an early human trial, lycopene improved post-surgical survival rates in aggressively treated patients with advanced prostate cancer, reducing levels of PSA, and shrinking both the primary tumor and metastases. More recent large-scale studies of men with prostate cancer showed that lycopene—alone or in combination with phytosterols and antioxidants—slowed and even halted rising PSA levels. A 2008 human study demonstrated that lycopene slows disease progression in men with BPH.

**Summary**

Fifty percent of men will eventually suffer enlarged prostate from benign prostatic hyperplasia (BPH), and 1 in 6 men will be diagnosed with prostate cancer during his lifetime. These age-related changes are far from inevitable. Saw palmetto extract is one of several natural compounds with clinically proven value in reducing symptoms of BPH and risk factors for prostate cancer. Each works by uniquely different mechanisms to confer multiple benefits and effective protection. Through a combination of direct impact on prostate tissue and powerful modulation of gene expression, these compounds operate through synergistic and complementary modes of action, attacking BPH and prostate cancer on multiple fronts. Compared to single-target drugs that provide only partial relief (and come with undesirable side effects), these natural interventions provide aging men with a safe, low-cost, alternative—for lifelong prostate health.

**Prostate Drugs: Limited Benefits, Sexual Side Effects**

Unlike the multi-targeted benefits of natural compounds, prescription prostate drugs work through narrow, single-targeted mechanisms of action—with a significant array of side effects. These drugs fall into two principal categories.

**5-Alpha Reductase Inhibitors.** These drugs inhibit the enzyme that converts testosterone into its active dihydrotestosterone (DHT) form. Saw palmetto extracts work by the same mechanism, as well as many others—without the side effects of prescription drugs. Finasteride (Proscar®) and dutasteride (Avodart®) are the main players. Both are effective at reducing lower urinary tract symptoms (LUTS) in benign prostatic hypertrophy (BPH). Finasteride is also approved for use in male pattern baldness (marketed as Propecia®). Both are also undergoing clinical evaluation for prostate cancer prevention, though to date their efficacy have been uncertain or modest at best.

While generally considered safe from a medical standpoint, these drugs have a troubling side effect profile, particularly related to their tendency to cause sexual problems such as erectile dysfunction (ED), ejaculatory dysfunction, decreased libido, and breast enlargement. ED is the most common and most troubling side effect. Because BPH itself can cause ED, it can be a difficult decision for men and their physicians about whether to start medication or not. A typical mainstream medical approach when faced with side effects from one drug is to add yet another drug (usually drugs belonging to the following category).
Alpha-adrenergic blockers. These prevent adrenaline from acting on adrenaline receptors in prostate tissue that contribute to BPH. Their sexual side effects are somewhat less pronounced than 5-alpha reductase blockers, with the exception of their impact on ejaculation. In a study of healthy volunteers, tamsulosin (Flomax®) markedly decreased ejaculation volume in almost 90% of subjects—and 35% were completely unable to ejaculate.107

Physicians who prescribe both categories of drugs generally recognize the importance of the sexual side effects that often accompany these drugs. Patients are advised to “consider the sexual dimension” in making treatment choices.107,110,111 Another approach is to consider the multi-targeted benefits of nutraceuticals, which are demonstrably free of these side effects—and may offer comparable benefits.6,15,16

References


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