

Diet and Prostate Cancer: Helping Your Patients Beat the Odds

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Recent Trends and Research Findings

Prostate cancer incidence increased steadily from 1981 to 1989, with a steep increase in the early 1990s, followed by a decline. Incidence rates were forecasted to remain stable through the year 2001. However, the exaggerated rate of increase in the early 1990s was transient, likely a result of increased early detection of preclinical prostate cancer from the widespread implementation of the new PSA (prostate-specific antigen) blood-screening test. Nevertheless, prostate cancer remains the most common form of cancer in North American men, as well as in other Western countries, and is the second leading cause of cancer death in males.¹

As reported in the *Journal of the National Cancer Institute*, as many as 75 percent of prostate cancer cases may be prevented if men follow more prudent nutritional practices, many of which will be outlined in this review.² In Japan, the incidence of prostate cancer is 80 percent lower than in North America and much of the Western world. Low rates are also found in Africa and Eastern Europe. Migration studies reveal that when men relocate from low to high-risk regions of the world and abandon their traditional dietary patterns, their incidence of prostate cancer rises to approach that of North American men.^{3,4}

In recent years, a number of nutritional factors and bioactive compounds have been identified that are strongly linked to the development of prostate cancer. In the past year, published data from the Harvard alumni study revealed that men with moderate liquor consumption (three drinks per week to three drinks per day) show a 61-67 percent increased risk of developing prostate cancer, compared to men who never or infrequently consume alcohol. Wine and beer did not appear to be as hazardous as liquor. However, men initiating alcohol consumption of any kind between 1977 to 1988 had double the risk of prostate cancer compared to men with almost no alcohol consumption at both evaluation dates (after controlling for other confounding variables). This study followed 7,612 Harvard alumni (mean age was 66.6 years) from 1988 -1993.⁵

Also in 2001, the study by K.T. Bogen and G.A. Keating provided evidence that higher intakes of heterocyclic amines among African-Americans, especially from pan-fried meats, may partially explain the twofold increase in prostate cancer in this group, as it was shown to consume approximately two and three times more heterocyclic amines at ages less than 16 and over 30, respectively. Heterocyclic amines are potent mutagens that increase the rates of colon, mammary, prostate and other cancers in bioassay rodents.⁶

In the journal *Oncogene* (2001), S.R. Chinni, et al. provided strong evidence to show that the indole ring structures present in cruciferous vegetables may play an important role in the prevention of prostate cancer. This study demonstrated that indole rings (indole-3-carbinols) can inhibit the growth of PC-3-type human prostate cancer cells by arresting their cell division cycle, and promote their demise through apoptosis (programmed cell death). The authors concluded that indole-3-

carbinols may be an effective chemopreventive or therapeutic agent against prostate cancer. Previously, similar findings have argued for the ingestion of indole-3-carbinols as a means to prevent breast cancer in women.⁷

A link between vascular disease and increased risk of prostate cancer has been reported recently, suggesting that heightened central sympathetic stimulation, which can lead to elevated blood pressure and heart rate, may overstimulate the androgen activity of prostate cells. Increased androgen activity is strongly linked to prostate cancer. Thus, heart rate and blood pressure may represent indirect markers of sympathetic stimulation of androgen activity on the prostate. In support of this model, recent data from a cardiovascular health study (2,442 men) demonstrated that men with a resting heart rate equal to or greater than 80 beats per minute had a 60-percent greater chance of developing prostate cancer during the 5.6-year follow-up period, compared to men with a resting heart rate of less than 60 beats per minute, an indirect indicator of cardiovascular fitness and lower sympathetic tone.⁸

In addition to these recent publications, a vast amount of prior evidence indicates that risk of prostate cancer is largely determined by nutritional and other lifestyle factors, and age-related changes that occur in the prostate gland. Incredibly, even undesirable age-related changes to the prostate may be preventable and reversible through nutrition and supplementation practices, including changes that lead to prostate enlargement (benign prostatic hyperplasia), which affects 50-60 percent of men by ages 40-59, and 80 percent of men by age 80. Thus, nutritional support for the prostate gland is considered to be an important anti-aging intervention to preserve the health and function of this gland, and important in the prevention and treatment of prostate disease.^{9,10} This review brings to light the evidence-based research that should prompt all health practitioners to counsel their male patients on the importance of nutrition in lifelong prostate health.

Age-Related Changes to the Prostate

As men age (by age 40), the prostate gland tends to accelerate the rate at which it converts testosterone to dihydrotestosterone (DHT). The build-up of DHT in prostate cells stimulates them to divide and multiply at a faster rate. This results in more prostate cells (more prostate mass) and the potential for prostate enlargement and other problems. As the prostate enlarges under the influence of DHT, men often notice symptoms such as reduced strength of their urine stream, more frequent urination, repeated nighttime urination, bladder urgency and related symptoms.¹⁰ More rapid cell division rates also increase the chances of forming cancerous DNA mutations. DHT is known to promote the spread of existing prostate cancer, and males born with the genetic inability to synthesize DHT are virtually immune from developing prostate cancer in their lifetimes. There is no question that DHT is linked to prostate cancer and prostate enlargement in a number of ways.^{11,12} Encouraging is that specific nutrients and natural bioactive compounds in foods and certain supplements have been shown to block the conversion of testosterone to DHT, and exert other protective effects within the prostate gland. As such, the consumption of these products at the correct dosage and/or standardized grade have been shown to be effective in the treatment of enlarged prostate problems, and some of these natural agents are associated with the prevention and (more recently) treatment of prostate cancer.¹³

Nutrients that Block the Build-up of DHT

There are several known natural agents that can effectively block the build-up of DHT within the prostate gland. The primary agents include the standardized grade of saw palmetto, *pygeum africanum*, beta-sitosterol, soy isoflavones and stinging nettle (*urtica dioica*).

Numerous studies have shown that the fatty acids and sterols present in saw palmetto block the build-up of DHT, and exert other favourable effects on prostate health. Saw palmetto extract is a proven therapy for enlarged prostate problems, and has recently been used in trials with prostate cancer patients, yielding impressive results in helping to contain the disease and lower PSA levels by more than 75 percent in many cases. For the prevention and treatment of benign prostatic hyperplasia (BPH), the usual dose is 160 mg (twice daily) of saw palmetto extract (standardized grade containing 90 percent fatty acids and sterols) or 320 mg (twice daily) of a standardized grade containing 45 percent fatty acids and sterols.

Pygeum africanum contains active compounds known as triterpenes, which have also been shown to be effective in the treatment of enlarged prostate problems in numerous human studies. The usual dose of pygeum for the prevention and treatment of BPH is 100-200 mg per day (standardized grade containing 12-14 percent triterpenes).

In recent years, prestigious medical journals such as *The Lancet* and the *British Journal of Urology* have published research papers demonstrating that beta-sitosterol (found in saw palmetto, soy products and other plant foods) at 20 mg three times per day, or 65 mg twice per day, is also extremely effective in reversing BPH.

Contained within soy products, including soy extract, are several important isoflavones, the most important being genistein and diadzein. These isoflavones directly inhibit the build-up of DHT and exhibit many other biological properties related to the prevention of prostate disease and prostate enlargement as men age. Soy isoflavones have been shown to induce apoptosis of human prostate cancer cell lines; decrease androgen stimulation to the prostate gland; slow the cell division rate of prostate cells and prostate cancer cells; and reduce the conversion of androstenedione to estrone hormone in adipose tissue by acting as an aromatase enzyme inhibitor. All of these physiological effects are known to reduce prostate cancer development and/or arrest prostate cancer growth. In Japan, where soy isoflavone intake is high (avg. 50 mg per day), prostate cancer incidence is 80 percent lower than in North America.

The herb stinging nettle also enjoys a reputation as a natural agent that has consistently been shown to reverse prostate enlargement in European studies. Prostate combination formulas often include 20-60 mg of stinging nettle as part of the complex.¹⁴⁻³⁴

Prostate Antioxidants

Studies indicate that prostate cancer may also arise from free radical damage to prostate cells, converting them into mutated cancer cells. Evidence is very strong to suggest that the antioxidant lycopene (derived from tomatoes) plays an essential role in protecting prostate cells from free radical damage. Lycopene is known to concentrate in the prostate gland and its fluids at levels much higher than are found in serum. As such, it has been shown to be a tissue-specific antioxidant in prostate health. Human studies, such as the Physicians' Health study and the Health Professionals' Follow-Up study have shown a striking correlation between higher lycopene blood and intake levels (six mg per day), and a marked reduction in prostate cancer development (as much as a 40-percent reduction). Experimental evidence also supports this protective effect of lycopene on prostate health.

Soy isoflavones (mentioned earlier in this review) are also known to provide antioxidant protection to the prostate gland. Soy intake is highly correlated with reduced prostate cancer development in epidemiological and experimental studies.

There has also been the suggestion from human intervention trials (placebo-controlled) that

vitamin E (60 IU per day) and selenium (200 mcg per day) supplementation provide antioxidant support to the prostate, resulting in a 30 to 60 percent reduction in the risk of prostate cancer.^{4,11,35-41}

Protecting the Prostate

To help combat the age-related changes to the prostate gland that lead to problems of enlargement, and the multistep processes involved in prostate cancer development, all men should practice prudent nutritional practices. Due to the changes that occur at around age 40, men this age and older should consider taking a supplement that contains the correct dosage and standardized grade of saw palmetto; pygeum africanum; beta-sitosterol; soy isoflavones; stinging nettle; lycopene; and other prostate-related nutrients, as a form of chemoprevention and general prostate gland support. The scientific evidence suggests that the following nutrition and lifestyle factors can favourably affect prostate health, and should be strongly considered by all men:

1. Consume a diet that is low in saturated fat.
2. Remain at or near your ideal body weight.
3. Consume alcohol in moderation, or not at all.
4. Consume tomatoes and tomato products daily.
5. Use more soy products: tofu, veggie burgers, miso soup, soy nuts and soymilk.
6. By age 40, consider taking a prostate support supplement that contains all the prostate herbal and accessory nutrients reviewed in this report. It is vital that the herbal and accessory compounds are present at the correct dosages and standardized grades to yield sufficient amounts of their bioactive agents.
7. Consider taking a high-potency multivitamin and mineral supplement that is enriched with other antioxidants, including vitamin E (400 IU), selenium (100-200 mcg), vitamin C (1,000 mg), etc.
8. Eat cruciferous vegetables a minimum of three to five times per week.
9. Remain fit, especially from a cardiovascular fitness standpoint, striving to achieve a resting heart rate of below 60 beats per minute.
10. Avoid pan-fried meats and other sources of heterocyclic amines (charred BBQ meats and blackened fish and meats).

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