

# Prostate Cancer Nutritional Support Following Radical Prostatectomy

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After receiving a radical prostatectomy for the treatment of localized prostate cancer, it is important for patients to implement certain dietary and supplementation practices to help reduce the risk of recurrence. Although prostatectomy is a highly successful cure for most cases of localized prostate cancer, there is always a risk that some prostate cancer cells may have escaped through the lymphatic system, in an attempt to form small colonies elsewhere in the body. These colonies can remain dormant (latent cancer) and undetectable for a considerable length of time. Several years after a radical prostatectomy these cancer cells can begin to replicate and produce the undesirable and often life-threatening consequences of metastatic cancer, often spreading to bone and later to the liver. Thus, implementing proactive lifestyle behaviors shown to encourage any remaining cancer cells to commit suicide (apoptosis), inhibit their growth and/or improve the cancer-killing action of the body's immune cells, are important follow-up considerations following a radical prostatectomy. Note that even the surgery itself can inadvertently cause the cancer to spread.

As noted by Kattan MW et al (J Clin Oncology 1999), "the most common definitive therapy for the treatment of clinically localized prostate cancer is radical prostatectomy. Unfortunately, approximately one third of men treated with radical prostatectomy later experience progression of their disease. Typically, the first indication that the disease has progressed is a detectable level of serum prostate-specific antigen (PSA) measured months or years after surgery". A large study involving 996 men that had undergone a radical prostatectomy, by the same surgeon, at Memorial Sloan-Kettering Cancer Center, New York, showed that 189 had evidence of recurrence of prostate cancer, most often occurring between 5-7 years after the prostatectomy was performed. (Kattan MW et al. J Clin Oncology 1999)

A significant number of experimental and clinical research studies suggest that certain dietary practices and the use specific nutritional supplements may be of value in helping to prevent recurrence or progression of certain cancers, including prostate cancer. These measures are not to be used in place of recommended medical protocols, but rather, may be considered as adjunctive (additional) interventions that may further help in these cases. In all instances, the following considerations should not be employed without the attending physician's knowledge and consent.

## Dietary Considerations:

1. Low Animal Fat Diet – Evidence suggests that the consumption of high-fat animal foods is linked to increased risk of cancer development and recurrence. As an example, breast cancer patients have been reported to be at increased risk of suffering a recurrence if they eat higher levels of fatty foods, such as butter, margarine, red meat, and bacon (Herbert JR, Hurley TG, Ma Yunsheng. *The effect of dietary exposures on recurrence and mortality in early stage breast cancer*. Breast Cancer Res Treat 1998;51:17–28.). This may be due to the fact that the high levels of saturated fat in these foods can increase secretion rates of various hormones that foster cancer growth or by increasing the secretion of bile acids into the intestinal tract, which are subsequently metabolized by gut bacteria into cancer-causing secondary sterols. High animal fat foods are also a rich source of a polyunsaturated fat known as arachidonic acid that provides the raw material from which body tissues make a hormone-like substance known as prostaglandin series-2. Prostaglandin series-2 encourages cells to divide at a faster rate, which poses a threat because faster rates of cell division tend to increase risk of cancer development and

cancer progression. Thus, consuming a low animal fat diet is a very important consideration for cancer prevention and as a means to reduce cancer recurrence.

2. Smoking – Strong evidence exists to show that smoking is the most important environmental cause of cancer. Cigarette smoking is not only a factor in 87% of all lung cancer cases, but is associated with more than 30% of all cases of cancer. Cigarette smoke contains enormous quantities of free radical agents that can damage cells and create genetic mutations.
3. More Cruciferous Vegetables – Cruciferous vegetables including broccoli, cauliflower, Brussels sprouts, cabbage, bok choy, and turnips, contain indole-3-carbinol, a substance that helps the body detoxify cancer-causing agents (and other foreign compounds), and has been shown to act in other ways to help lower cancer risk for several types of cancer, including prostate cancer. One should consider consuming any combination of these vegetables on a daily basis.
4. Alcohol – After smoking, alcohol consumption is considered to be the second most important environmental cause of cancer, being associated with approximately 3% of all cancer cases. As few as two to three alcoholic drinks per day, on average, is linked to doubling or tripling the incidence of certain cancers, compared to an alcohol consumption of less than two drinks per day, on average. The Harvard Alumni Study and other studies have shown that alcohol is associated with increased prostate cancer risk and progression of the disease. Alcohol has been shown to promote cancer development by increasing free radical damage, speeding up the delivery of cancer-causing agents into the cells of the body (co-carcinogen role), weakening the immune system, overstimulating the release of certain hormones associated with cancer, reducing availability of folic acid (a B-vitamin required for normal DNA synthesis), and by speeding up rates of cell division. Thus, restricting alcohol consumption is a strong consideration in cancer prevention.
5. Ideal Weight – Studies indicate that being overweight increases the risk of certain cancers, especially reproductive cancers (including prostate cancer) and possibly colon cancer. Increased body fat tends to encourage the over-production of certain hormones that are linked to the development and progression of certain cancers. It is, therefore, prudent to remain at or near one's ideal body weight.
6. Limit Or Avoid Nitrate-Containing Foods – Many processed foods contain nitrate and/or nitrite compounds that can be converted by the body into nitrosamines. Nitrosamines have been shown to cause cancerous mutations in experimental and animal studies and are strongly linked to an increased risk of certain human cancers. Thus, it is wise to read package labels carefully in order to avoid a high dietary intake of nitrates and nitrites.
7. Avoid Charred Foods and Pan-fried Meats – Charred foods and pan-fried meats contain heterocyclic amines that cause cancerous mutations in experimental and animal studies, and are strongly linked to increased risk of some human cancers.
8. Smoked Meats and Fish – Smoked meats and fish contain polycyclic aromatic hydrocarbons that cause cancerous mutations in experimental and animal studies, and are strongly linked to an increased risk of some human cancers.

9. Avoid Exposure to Other Known Carcinogens (asbestos dust, ultra-violet light, X-Rays etc.) – A number of other environmental factors can increase the production of free radicals in the body and, thereby, increase cancer risk. Always do your best to reduce your exposure to known carcinogens, avoid over exposure to sunlight and tanning beds (to reduce risk of skin cancer) and have X-rays taken only when necessary.
10. Consume At Least 5 Servings of Fruits And Vegetables Per Day – Studies have shown that individuals who consume at least 5 servings of fruits and vegetables each day, on average, have half the cancer rates as those who consume fewer quantities of fruits and vegetables. Fruits and vegetables contain antioxidants, vitamins, minerals and a variety of phytonutrients that are important in warding off cancer development.

### Supplement Considerations

The following represents the supplementation recommendations made to patients seen at our clinic, who previously have undergone a radical prostatectomy:

1. High Potency Multi-Vitamin and Mineral – A number of vitamins, minerals and antioxidants have been shown to help suppress the growth of various forms of cancer under experimental conditions and reduce the rate of cancer recurrence in some clinical trials, as outlined below. A high potency multi-vitamin and mineral provides your body with a strong head start in regards to the overall vitamin and mineral supplementation program that may be considered in these cases.
2. Additional Vitamin E Succinate (2,000-3,000 IU per day) – Experimental studies demonstrate that vitamin E succinate can help suppress the growth of various types of cancer by inhibiting cancer cell division and by enhancing programmed cell death of cancer cells. Taken in conjunction with other antioxidant supplements (vitamin C, selenium, beta-carotene, co-enzyme Q10), several human studies have shown that vitamin E may be helpful in reducing the risk of recurrence of some forms of cancer (Lockwood K. et al. *Apparent partial remission of breast cancer in "high risk" patients supplemented with nutritional antioxidants, essential fatty acids and coenzyme Q10.* Mol Aspects Med 1994;15(Suppl):231S-40S). Studies have shown that vitamin E, in the form of Vitamin E Succinate, exhibits the most potent anti-cancer effects, compared to all other forms of vitamin E. As such, Vitamin E Succinate should be the form of vitamin E you consider in this instance
3. Additional Vitamin C (2,000-3000 mg) – Experimental studies demonstrate that vitamin C can help reduce the risk of cancer recurrence for certain types of cancer by inhibiting the production of cancer-causing nitrosamines, boosting immune function and through other mechanisms of action Taken in conjunction with other antioxidant supplements (vitamin E, selenium, beta-carotene, co-enzyme Q10), several human studies have shown that it may be helpful in reducing the risk of recurrence of some forms of cancer (Lockwood K, et al. *Apparent partial remission of breast cancer in "high risk" patients supplemented with nutritional antioxidants, essential fatty acids and coenzyme Q10.* Mol Aspects Med 1994;15(Suppl):231S-40S).
4. Additional Selenium (500 mcg per day) – Experimental studies indicate that selenium can help suppress the growth of certain cancers by inhibiting the cellular replication of cancer cells and by boosting immune function. Taken in conjunction with other antioxidant supplements (vitamin E, vitamin C, beta-carotene, co-enzyme Q10), several human studies have shown that it may be helpful in reducing the risk of recurrence of some forms of cancer

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5. Immune and Detoxification Support Nutrients – The cancer killing capacity of immune cells has been shown to be improved with supplementation of certain mushrooms as well as astragalus. It is also important to boost detoxification processes within the cells to neutralize and eliminate any cancer-promoting chemicals that can spur on the replication of latent cancers. Thus, we at our clinic (United Medicine Group) we recommend that patients who have undergone a radical prostatectomy, as well as other cancer patients, take 4 capsules per day of an immune and detoxifying supplement containing the following ingredients:
  - Reishi Mushroom Extract – (std to 10% polysaccharide; 4% triterpene content) - 100 mg
  - Astragalus - (2:1 ratio) – 100 mg
  - Milk Thistle - (std to 80% silymarin content) – 150 mg
  - Indole-3 carbinol – 25 mg
  
6. Chinese Scullcap (150 to 200 mg per day of pure Baicalein Flavonoid derived from Chinese scullcap) – Many experimental studies indicate that the baicalein flavonoid found exclusively in Chinese scullcap prevents and inhibits cancer growth via a number of direct and indirect physiological actions:
  - Baicalein has been shown to inhibit the 12-lipoxygenase enzyme, which converts arachidonic acid into a hormone-like substance that is required for cancer cells to replicate. Studies demonstrate that, by inhibiting the 12-lipoxygenase enzyme, baicalein has been shown to inhibit cancer cell proliferation and induces apoptosis (programmed cell death) of many different human cancer cells, including prostate cancer cells. Experimental evidence suggests that, in the presence of baicalein, various cancer cells can be prevented from multiplying and metastasizing to other tissues and that a primary mechanism through which this occurs is via the inhibition of 12-lipoxygenase enzyme activity.
  - Baicalein has also demonstrated an ability to slow or inhibit the replication rate of many different cancers under experimental conditions, which appears to be due to its ability to suppress the release of enzymes required for cancer cell division (protein tyrosine kinase activity and protein kinase C activity).
  - Baicalein is also a strong antioxidant, and has been shown to protect DNA from undergoing cancerous mutations in challenge studies using potent carcinogens such as benzo{a}pyrene, and toxins such as aflatoxin (AF) B.
  - In vitro evidence indicates that baicalein stimulates recombination and repair of damaged DNA, supporting its traditional inclusion in cancer formulas, and suggesting possible use after sunburn and radiation damage.
  - Baicalein has also been shown to inhibit the 5alpha-reductase enzyme, which converts testosterone to dihydrotestosterone (DHT). DHT is strongly associated with the development of prostate enlargement (benign prostatic hyperplasia) and prostate cancer. As such, baicalein is reported to be potentially useful for the prevention and/or treatment of androgen-dependent (testosterone-driven) disorders, including prostate enlargement and prostate cancer.
  
7. Essential Fatty Acids (combination of borage seed, flaxseed and fish oil) – This combination of oils provides the body with essential fatty acids that are used by the body to make local hormones (prostaglandin series 1 and 3), which are known to slow rates of cell division and reduce inflammatory reactions. Both of these activities are known to play a role in cancer prevention. The daily therapeutic dosage to be considered would be 4-6 capsules of a 1200

mg essential oil capsule, with each capsule containing 400 mg each, of borage seed, flaxseed and fish oil.

8. Vitamin D (5,000 IU per day) – Studies indicate that many human prostate cancer cells possess vitamin D receptors on their outer membrane (outer skin of the cell). Stimulation of these receptors by vitamin D has been shown to increase the maturation of these cells (makes them look more normal), reduces their malignant behavior and slows down their rate of cell division. In experimental studies, Vitamin D has been shown to suppress cancer cell proliferation, induce cancer cell apoptosis (programmed cell death), and differentiation, demonstrating a strong potential role in the prevention and management of colon, breast and prostate cancer. Vitamin D supplementation has been shown to slow the rise of PSA in men with localized prostate cancer. It also has immune-modulating properties that are important to cancer prevention and treatment.
9. Prostate Support Nutrients – It is known that prostate cancer cells divide and spread through the body under the influence of dihydrotestosterone hormone. Certain natural herbal agents have been shown to block the build-up of dihydrotestosterone, some of which have demonstrated an ability to slow or retard the progression of prostate cancer and/or lower or slow the rate of rise in blood levels of the prostate specific antigen (PSA), which is an indicator of prostate cancer progression.

For this reasons prostate cancer patients (including those who have had their prostate gland removed due to the presence of prostate cancer) should consider taking a combination product containing the following natural prostate support nutrients: Saw Palmetto, Pygeum Africanum, Beta-sitosterol, Stinging Nettle, and Lycopene. The daily dosage to be considered would include:

- A. Saw Palmetto – this herb should be a standardized grade of 45% fatty acids and sterols, taken at a dosage of 720 mg, twice daily (or an 85-90% standardized grade of fatty acids and sterols, taken at a dosage of 160 mg, twice daily).
  - B. Pygeum Africanum – this herb should be a standardized grade of 12-14% triterpenes, taken at a dosage of 200 mg, twice daily.
  - C. Beta-Sitosterol – this plant-based substance should be taken at a dosage of 120 mg, twice daily
  - D. Soy Isoflavones – this special class of flavonoids derived from soybeans should be taken at a minimum dosage of 50 mg per day (up to 200 mg per day)
  - E. Stinging Nettle – this herb should used concurrently with other prostate support nutrients at a minimum dosage of 60 mg, twice daily, using 5:1 extract.
  - F. Lycopene – lycopene is a carotenoid found in tomatoes and other red and pink fruits and vegetables. It accumulates in the prostate gland once ingested orally from food and supplements. There is some evidence that lycopene may be helpful in the treatment of prostate cancer. In one study, 26 men with prostate cancer were randomly assigned to receive lycopene (15 mg twice a day) or no lycopene for three weeks before undergoing prostate surgery. Prostate tissue was then obtained during surgery and examined. Compared with the unsupplemented men, those receiving lycopene were found to have significantly less aggressive growth of cancer cells. In addition, a case report has been published of a 62-year-old man with advanced prostate cancer who experienced a regression of his tumor after starting 10 mg of lycopene per day and 300 mg of saw palmetto, three times per day.
10. Ground Flaxseed – 50 gm per day (2 heaping tablespoons) - enterolactone and enterodiol formed from lignan precursors found in flaxseeds, inhibit key enzymes that convert androgens into estrone hormone and estrone into estradiol. It has been shown that these forms of estrogen encourage prostate cancer development and progression by

decreasing the break down of dihydrotestosterone. Enterolactone and enterodiol may also compete with other estrogens for binding to estrogen receptors on prostate cells, toning down that estrogenic influence on prostate cancer cells, which in turn, slows proliferation rate of these cells. Studies have shown that ground flaxseed exerts anti-proliferative effects on human prostate cancer cells in-vivo.

11. Soy Isoflavones – 100-200 mg per day – A study showed that men with prostate cancer who ingested 100 mg per day of soy isoflavones showed a slower rise in their blood PSA levels. In this study men with existing prostate cancer, who were supplemented with 100 mg per day of soy isoflavones, showed a favorable outcome in stabilizing PSA levels. Soy isoflavone supplementation was shown to decrease the rate of rise in serum PSA (prostate specific antigen) levels in patients with androgen dependent and androgen-independent prostate cancer. The researchers concluded that their data suggests that soy isoflavones may benefit some patients with prostate cancer by slowing the progression of the disease and, therefore, potentially delaying the development of symptoms, improving quality of life, and perhaps even prolonging survival. A large body of experimental evidence suggests that soy isoflavones and other derivatives of soy extract can inhibit the development and progression of prostate and other cancers via a number of mechanisms.
12. Melatonin - 3-5 mg per day (one hour before bedtime) – Studies in Italy (Dr Lissoni) suggest that melatonin can suppress cancer growth of prostate cancer in human subjects. Prostate cancer cells have been shown to maintain melatonin receptors, which, upon stimulation, slow the rate of cell division and encourage greater differentiation (more normal appearance and behaviour of cancer cells), as well as enhancing the cancer-killing effect of key immune cells.
13. Pomegranate Juice – two recent studies have shown that drinking 8 ounces of pure pomegranate juice per day helped to manage prostate cancer cases that were previously unresponsive to other medical drug interventions. The medicinal ingredient in pomegranate juice has not yet been identified, but drinking 8 ounces of pure, unadulterated pomegranate juice, each day, is highly advisable for all men to consider.

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