

A SUMMARY OF THE
LATEST INTEGRATIVE CANCER CARE RESEARCH
FOR MEN WITH PROSTATE CANCER:

WHAT YOU NEED TO KNOW

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This report summarizes the scientific evidence, translated in easy to understand language, that the following is important information for men with prostate cancer to know to optimally support their health:

- Cancer patients should exercise during and after cancer treatments in order to reduce fatigue.
- Home-based exercise interventions can benefit prostate cancer patients by improving health and quality of life.
- Exercising during treatment may prevent fatigue and a reduction in fitness levels. Exercising after treatment may help reduce fatigue and increase fitness.
- Men should substantially reduce dairy products in the diet to decrease risk of prostate cancer.
- Men should reduce dairy products in the diet to reduce risk of prostate cancer.
- It is important for men with prostate cancer to reduce saturated fat in the diet, and to lose weight if overweight, in order to reduce the risk of prostate cancer recurrence.
- Men should try to replace bad fats in the diet (saturated fats from animal products) with good fats such as olive oil. This will help balance fatty acid levels in the prostate.
- Men should make changes to their overall dietary patterns by moving away from the 'Western' pattern and toward patterns such as the 'vegetable' and 'health-conscious' ones described in this study.
- A very low-fat diet can help to increase positive elements and decrease negative elements in the diet.
- Zinc is found in oysters, red meat, and poultry, as well as beans, legumes, seeds, and nuts. Higher amounts of zinc are ingested through oysters, meat and poultry; men should eat only moderate amounts of these foods.
- Men should eat fatty fish like salmon at least once per week to reduce risk of prostate cancer.
- Eating lots of cruciferous vegetables, including broccoli and cauliflower, may reduce risk of aggressive and advanced prostate cancer.
- Intensive lifestyle and nutrition changes can change the way genes act in prostate tissue, possibly slowing the growth of prostate cancer.

- Targeted telephone counselling can increase the amounts of vegetables and tomato products that men with prostate cancer eat, and prevent their disease from progressing.
- Men should eat several extra servings of cruciferous vegetables such as broccoli, cauliflower, kale, cabbage, etc. each week to reduce the risk of prostate cancer.
- Canadian cancer survivors should participate in physical activity and maintain a healthy body weight to stay healthy.
- Men with higher body mass index (obesity) are at greater risk of dying from locally advanced prostate cancer.
- PSA screening is less effective in obese men, leading to delayed diagnosis and worse prognosis.
- Obese men are more likely to have their cancer spread and to die of prostate cancer.
- Group-based psychological interventions can help men recover sexual function after radical prostatectomy.
- Telephone support can be useful for men newly diagnosed with prostate cancer, particularly when patients are making treatment decisions.
- Specific prostate cancer treatment can negatively affect quality of life in patients in different ways, leading to dissatisfaction with treatment outcomes.
- Patients with both prostate cancer and cardiovascular disease have worse physical and sexual quality of life before and during treatment.
- Medical Qigong along with usual medical treatment can enhance the quality of life of cancer patients and reduce treatment side effects and inflammation.
- Patients who receive mismatched treatments have worse outcomes. Better physician-patient communication is advised, perhaps by using a thorough questionnaire before decision-making.
- Active surveillance may be a good option for some men with early-stage prostate cancer.

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Exercise

Cramp, F and J. Daniel. **Exercise for the Management of Cancer-Related Fatigue in Adults** *Cochrane Database of Systematic Reviews*. 2008 2: 006145.

Original Abstract:

BACKGROUND: Cancer-related fatigue is now recognised as an important symptom associated with cancer and its treatment. A number of studies have investigated the effects of physical activity in reducing cancer-related fatigue with no definitive conclusions regarding its effectiveness. **OBJECTIVES:** To evaluate the effect of exercise on cancer-related fatigue both during and after cancer treatment. **SEARCH STRATEGY:** The Cochrane Controlled Trials Register (CENTRAL/CCTR), MEDLINE (1966 to July 2007), EMBASE (1980 to July 2007), CINAHL (1982 to July 2007), British Nursing Index (January 1984 to July 2007), AMED (1985 to July 2007), SIGLE (1980 to July 2007), and Dissertation Abstracts International (1861 to July 2007) were all searched using key words. Reference lists of all studies identified for inclusion and relevant reviews were also searched. In addition, relevant journals were hand searched and experts in the field of cancer-related fatigue were contacted. **SELECTION CRITERIA:** Randomised controlled trials (RCTs) that investigated the effect of exercise on cancer-related fatigue in adults were included. **DATA COLLECTION AND ANALYSIS:** Two review authors independently assessed the methodological quality of studies and extracted data based upon predefined criteria. Where data were available meta-analyses were performed for fatigue using a random-effects model. **MAIN RESULTS:** Twenty-eight studies were identified for inclusion (n = 2083 participants), with the majority carried out on participants with breast cancer (n = 16 studies; n = 1172 participants). A meta-analysis of all fatigue data, incorporating 22 comparisons provided data for 920 participants who received an exercise intervention and 742 control participants. At the end of the intervention period exercise was statistically more effective than the control intervention (SMD -0.23, 95% Confidence Interval (CIs) -0.33 to -0.13). **AUTHORS' CONCLUSIONS:** Exercise can be regarded as beneficial for individuals with cancer-related fatigue during and post cancer therapy. Further research is required to determine the optimal type, intensity and timing of an exercise intervention. [References: 74]

WHAT YOU NEED TO KNOW:

Fatigue is a common symptom associated with cancer and its treatment. Studies have been done on reducing fatigue through exercise, but conclusive results have not been found. The objective of this review was to evaluate the effectiveness of exercise on cancer-related fatigue both during and after cancer treatment.

The authors completed a thorough search and selection process to determine which articles to include in this review; 28 studies met the requirements to be included. After data extraction and complex statistical analyses, data from 920 participants who participated in an exercise program and 742 control participants (no exercise program) was compared.

The results showed that exercise was significantly effective at reducing fatigue in people undergoing cancer treatment, as well as people who are finished their cancer treatments. Further research should be done to determine the best type, intensity, and timing of exercise programs from cancer patients.

THE BOTTOM LINE:

Cancer patients should exercise during and after cancer treatments in order to reduce fatigue.

Original Abstract:

The purpose of the current study was to examine the viability of conducting a theory-based physical activity (PA) intervention on men with prostate cancer, and the impact of PA on quality of life (QOL). Participants were 31 men, average age of 67 years, with localized or metastatic prostate cancer undergoing androgen deprivation therapy (ADT). Global QOL, fatigue, and PA measures were conducted at baseline and following the 12-week intervention. An additional follow-up testing was conducted 4 months following the intervention ($n = 18$). Both moderate and strenuous bouts of exercise, as well as functional capacity, increased significantly from pre- to posttest. Both fatigue severity and resting heart rate decreased significantly at posttest. A trend toward improved global QOL was also noted. It was concluded that a 12-week home-based PA intervention may provide health and QOL benefits for prostate cancer patients undergoing ADT. Practitioners are encouraged to promote PA for prostate cancer survivors.

WHAT YOU NEED TO KNOW:

The purpose of this study was to determine if giving men information about the benefits of exercise would increase their activity levels and ultimately improve quality of life.

Participants in this study were 31 men with an average age of 67 years. They all had either early-stage or advanced prostate cancer and were being treated with androgen deprivation therapy or ADT (a reduction of male hormones in the body). The researchers gathered information about the men's quality of life, fatigue, and activity levels before the 12 week program, after the program, and again four months later.

The results showed the following:

- ❖ Men significantly increased moderate exercise and strenuous exercise.
- ❖ Both fatigue and resting heart rate decreased significantly.
- ❖ Quality of life improved.

THE BOTTOM LINE:

Home-based exercise interventions can benefit prostate cancer patients by improving health and quality of life.

Schneider, CM, C. C. Hsieh, L. K. Sprod, S. D. Carter and R. Hayward. **Exercise Training Manages Cardiopulmonary Function and Fatigue during and Following Cancer Treatment in Male Cancer Survivors.** *Integrative Cancer Therapies.* 2007 Sep; 63: 235-241.

Original Abstract:

This investigation determined the cardiopulmonary function and fatigue alterations in male cancer survivors during treatment as well as following treatment utilizing similar exercise assessment protocols and individualized, prescriptive exercise interventions. The study included 45 male cancer survivors that were referred by local oncologists. Following a comprehensive screening and physical examination, cardiovascular endurance, pulmonary function, and fatigue were assessed leading to the development of 12-week individualized exercise prescriptions and exercise interventions. The cancer survivors were divided into during treatment (DTm) and following treatment (FTm) groups. Repeated-measures analysis of variance and analyses of covariance were used to compare pre- versus postintervention and between groups. Cardiopulmonary function was maintained in the DTm, whereas the FTm showed significant reductions in resting heart rate ($P < .05$) with concurrent increases in predicted VO_{2max} and time on treadmill ($P < .05$) postexercise intervention. Fatigue levels did not increase in the DTm group, whereas the FTm group showed significant reductions in behavioral fatigue, affective fatigue, sensory fatigue, cognitive/mood fatigue, and total fatigue ($P < .05$) after the exercise intervention. The results of the current study suggest that moderate intensity, individualized, prescriptive exercise intervention maintains or improves cardiovascular and pulmonary function with concomitant reductions in fatigue in cancer survivors during and following cancer treatment. Exercise appears to be a safe, efficacious strategy for improving physical fitness in cancer survivors during and following treatment.

WHAT YOU NEED TO KNOW:

This study looked at cardiovascular capacity, lung function, and fatigue levels in male cancer survivors and the benefit of exercise on these measures.

The 45 participants in the study were referred by their oncologists. Researchers measured cardiovascular endurance, lung function, and fatigue. Each participant received an individualized 12-week exercise program. Half the participants did the exercise program during treatment; the other half did the exercise program after completing cancer treatment.

The results showed the following:

- ❖ Participants in the *exercise during treatment* group maintained their usual levels of cardiovascular endurance and lung function. Their fatigue levels did not increase.
- ❖ Participants in the *exercise after treatment* group showed decreased levels of fitness; their fitness levels increased again after completing the exercise program.
- ❖ Participants in the *exercise after treatment* group had increased fatigue, which was significantly reduced after completing the exercise program.

Exercise appears to be a safe, effective way to improve fitness in cancer survivors during and after treatment.

THE BOTTOM LINE:

Exercising during treatment may prevent fatigue and a reduction in fitness levels. Exercising after treatment may help reduce fatigue and increase fitness levels.

Fatty Acids, Animal Foods & Calcium

Allen, NE, T. J. Key, P. N. Appleby, et al. **Animal Foods, Protein, Calcium and Prostate Cancer Risk: The European Prospective Investigation into Cancer and Nutrition.** *Br J Cancer.* 2008 May 6; 989: 1574-1581.

Original Abstract:

We examined consumption of animal foods, protein and calcium in relation to risk of prostate cancer among 142 251 men in the European Prospective Investigation into Cancer and Nutrition. Associations were examined using Cox regression, stratified by recruitment centre and adjusted for height, weight, education, marital status and energy intake. After an average of 8.7 years of follow-up, there were 2727 incident cases of prostate cancer, of which 1131 were known to be localised and 541 advanced-stage disease. A high intake of dairy protein was associated with an increased risk, with a hazard ratio for the top versus the bottom fifth of intake of 1.22 (95% confidence interval (CI): 1.07-1.41, P(trend)=0.02). After calibration to allow for measurement error, we estimated that a 35-g day⁽⁻¹⁾ increase in consumption of dairy protein was associated with an increase in the risk of prostate cancer of 32% (95% CI: 1-72%, P(trend)=0.04). Calcium from dairy products was also positively associated with risk, but not calcium from other foods. The results support the hypothesis that a high intake of protein or calcium from dairy products may increase the risk for prostate cancer.

WHAT YOU NEED TO KNOW:

This study looked at the consumption of animal foods, protein, and calcium as risk factors for prostate cancer. 142,251 men participated in the European Prospective Investigation into Cancer and Nutrition study. For this large study the participants gave the researchers detailed information about diet and lifestyle. Approximately 8.5 years after the study began, 2,727 of these men had been diagnosed with prostate cancer. 1,131 of these men had localized prostate cancer, and 541 had advanced prostate cancer. For this paper the researchers analyzed the animal foods, protein, and calcium consumption of the 2727 men diagnosed with prostate cancer.

The results showed that a diet high in dairy protein increased risk of prostate cancer. Calcium from dairy products also increased risk of prostate cancer; however calcium from other foods did not.

THE BOTTOM LINE:

Men should substantially reduce dairy products in the diet to decrease risk of prostate cancer.

Editor's Comment:

We recommend that men with diagnosed prostate cancer avoid dairy products entirely.

Kurahashi, N, M. Inoue, M. Iwasaki, S. Sasazuki and S. Tsugane. **Dairy Product, Saturated Fatty Acid, and Calcium Intake and Prostate Cancer in a Prospective Cohort of Japanese Men.** *Cancer Epidemiology Biomarkers and Prevention*. 2008 Apr; 174: 930-937.

Original Abstract:

Many epidemiologic studies have reported a positive association between dairy products and prostate cancer. Calcium or saturated fatty acid in dairy products has been suspected as the causative agent. To investigate the association between dairy products, calcium, and saturated fatty acid and prostate cancer in Japan, where both the intake of these items and the incidence of prostate cancer are low, we conducted a population-based prospective study in 43,435 Japanese men ages 45 to 74 years. Participants responded to a validated questionnaire that included 138 food items. During 7.5 years of follow-up, 329 men were newly diagnosed with prostate cancer. Dairy products were associated with a dose-dependent increase in the risk of prostate cancer. The relative risks (95% confidence intervals) comparing the highest with the lowest quartiles of total dairy products, milk, and yogurt were 1.63 (1.14-2.32), 1.53 (1.07-2.19), and 1.52 (1.10-2.12), respectively. A statistically significant increase in risk was observed for both calcium and saturated fatty acid, but the associations for these were attenuated after controlling for potential confounding factors. Some specific saturated fatty acids increased the risk of prostate cancer in a dose-dependent manner. Relative risks (95% confidence intervals) on comparison of the highest with the lowest quartiles of myristic acid and palmitic acid were 1.62 (1.15-2.29) and 1.53 (1.07-2.20), respectively. In conclusion, our results suggest that the intake of dairy products may be associated with an increased risk of prostate cancer. Copyright 2008 American Association for Cancer Research.

WHAT YOU NEED TO KNOW:

Many studies have reported that eating dairy products raises risk of prostate cancer. Researchers suspect that it is either the calcium or saturated fats in the dairy products that cause this to occur.

This study looked at the association between dairy products, the calcium and saturated fats in dairy products, and prostate cancer. The study took place in Japan where both intake of these items and rates of prostate cancer are low. 43,435 Japanese men between the ages of 45-74 years filled out a questionnaire about food. During the next 7.5 years, 329 men were diagnosed with prostate cancer.

The results showed an increased risk of prostate cancer for men who ate higher amounts of dairy products. Dairy calcium and saturated fat intake also increased risk of prostate cancer.

THE BOTTOM LINE:

Men should reduce dairy products in the diet to reduce risk of prostate cancer.

Strom, SS, Y. Yamamura, M. R. Forman, C. A. Pettaway, S. L. Barrera and J. DiGiovanni. **Saturated Fat Intake Predicts Biochemical Failure After Prostatectomy.** *International Journal of Cancer.* 2008 Jun 1; 12211: 2581-2585.

Original Abstract:

Previous reports show that obesity predicts biochemical failure after treatment for localized prostate cancer. Since obesity is associated with increased fat consumption, we investigated the role that dietary fat intake plays in modulating obesity-related risk of biochemical failure. We evaluated the association between saturated fat intake and biochemical failure among 390 men from a previously described prostatectomy cohort. Participants completed a food frequency questionnaire collecting nutrient information for the year prior to diagnosis. Because fat and energy intake are highly correlated, the residual method was used to adjust fat (total and saturated) intakes for energy. Biochemical-failure-free-survival rates were calculated using the Kaplan-Meier method. Crude and adjusted effects were estimated using Cox proportional hazards models. During a mean follow-up of 70.6 months, 78 men experienced biochemical failure. Men who consumed high- saturated fat (HSF) diets were more likely to experience biochemical failure ($p = 0.006$) and had significantly shorter biochemical-failure-free-survival than men with low saturated fat (LSF) diets (26.6 vs. 44.7 months, respectively, $p = 0.002$). After adjusting for obesity and clinical variables, HSF-diet patients were almost twice as likely to experience biochemical failure (hazard ratio = 1.95, $p = 0.008$) compared to LSF diet patients. Men who were both obese and consumed HSF diets had the shortest biochemical-failure-free-survival (19 months), and nonobese men who consumed LSF diets had the longest biochemical-failure-free-survival (46 months, $p < 0.001$). Understanding the interplay between modifiable factors, such as diet and obesity, and disease characteristics may lead to the development of behavioral and/or targeted interventions for patients at increased risk of progression. (c) 2008 Wiley-Liss, Inc.

Note: Biochemical failure refers to a rise in PSA greater than or equal to 0.1ng/ml. This suggests a progression or recurrence of prostate cancer.

WHAT YOU NEED TO KNOW:

Previous studies have shown that obesity is a risk factor for recurrence of early stage prostate cancer. Obesity is associated with increased fat consumption in the diet; therefore, this study investigated the role of dietary fat, obesity and risk of recurrence of prostate cancer in 390 men who had had a prostatectomy.

All the participants had completed a food questionnaire for a year before being diagnosed with prostate cancer. Based on the questionnaires, the researchers calculated fat and energy (calorie) intakes for the participants. Over the next 7 years, 78 men experienced a recurrence of their disease.

The study results showed the following:

- ❖ Men who ate diets high in saturated fat were more likely to have a recurrence of disease.
- ❖ Men who ate diets high in saturated fat had significantly shorter periods of being disease free (26.6 months) than men who ate diets low in saturated fat (44.7 months).
- ❖ Men who ate diets high in saturated fat were twice as likely as men who ate diets low in saturated fat to experience a recurrence of their disease.
- ❖ Men who were obese and ate diets high in saturated fat had the shortest periods of being disease free.
- ❖ Men who were a healthy weight and ate diets low in saturated fat had the longest periods of being disease free.

THE BOTTOM LINE:

It is important for men with prostate cancer to reduce saturated fat in the diet, and to lose weight if overweight, in order to reduce the risk of prostate cancer recurrence.

Kositsawat, J, R. C. Flanigan, M. Meydani, Y. -K Choi and V. L. Freeman. **The Ratio of Oleic-to-Stearic Acid in the Prostate Predicts Biochemical Failure After Radical Prostatectomy for Localized Prostate Cancer.** *J Urol.* 2007 Dec; 1786: 2391-2396.

Original Abstract:

Purpose: To identify lifestyle related factors that may influence the prognosis of clinically localized prostate cancer we evaluated the relative impact of obesity and prostatic fatty acid concentrations at diagnosis on the risk of biochemical failure following radical prostatectomy. **Materials and Methods:** Height and weight were measured in 195 men scheduled for radical prostatectomy for clinically localized prostate cancer. Fatty acids were measured in nonmalignant prostate tissue collected at surgery. Biochemical failure was defined as detectable serum prostate specific antigen (0.1 ng/ml or greater). Cox proportional hazards models and logistic regression, respectively, were used to analyze the association of obesity (body mass index 30 kg/m^2 or greater) and prostatic fatty acid concentrations with time to biochemical failure and the relative odds of biochemical failure at different time points after accounting for prostate specific antigen at diagnosis, surgical margin status, pathological stage, Gleason sum, patient age, race/ethnicity and other factors. **Results:** During an average followup of 56 months the oleic-to-stearic acid ratio predicted the risk of biochemical failure (multivariate HR 1.50, 95% CI 1.17-1.91, $p = 0.001$ per 1 standard deviation increase). Obesity did not correlate with biochemical failure during the entire study period. However, obesity tended to be associated with biochemical failure within the first 2 years (multivariate OR 2.55, 95% CI 0.84-7.77, $p = 0.10$). **Conclusions:** The oleic-to-stearic acid ratio in the prostate predicts the risk of biochemical failure following radical prostatectomy for clinically localized prostate cancer. This observation and the tendency of obesity to be associated with biochemical failure during the first 2 years in our cohort suggest that lifestyle related factors influence the prognosis of clinically early stage prostate cancer.

Note: *Biochemical failure* refers to a prostate specific antigen (PSA) score of 0.1ng/ml or more. This suggests a progression or recurrence of prostate cancer.

- ❖ *Stearic acid* is a saturated fatty acid found primarily in animal products.
- ❖ *Oleic acid* is a healthier, unsaturated fatty acid found, for example, in olive oil.

WHAT YOU NEED TO KNOW:

The objective of this study was to identify lifestyle factors that might predict which men with early-stage prostate cancer were at risk for a recurrence or progression of disease. Specifically, this study looked at the relationship between obesity and fatty acids in the prostate at the time of diagnosis, and risk of 'biochemical failure' in men treated with radical prostatectomy (removal of the prostate and surrounding tissue).

Before their surgeries, the 195 study participants were measured and weighed. Fatty acids were measured in non-cancerous prostate tissues that were collected during the surgeries. The participants were followed for approximately 4.5 years. After statistical analyses and adjustments, the following results were found:

- ❖ The ratio of oleic acid (good) and stearic acid (bad) in the prostate tissue predicted risk of biochemical failure (recurrence).
- ❖ Obesity was associated with biochemical failure (recurrence) in the first 2 years after surgery.

THE BOTTOM LINE:

Men should try to replace bad fats in the diet (saturated fats from animal products) with good fats such as olive oil. This will help balance fatty acid levels in the prostate.

Nutrition

Ambrosini, GL, L. Fritschi, N. H. de Klerk, D. Mackerras and J. Leavy. **Dietary Patterns Identified using Factor Analysis and Prostate Cancer Risk: A Case Control Study in Western Australia.** *Ann Epidemiol.* 2008 May; 185: 364-370.

Original Abstract:

Purpose: Dietary patterns offer an alternative method for analyzing dietary intakes that take into account the whole diet. We investigated empirical dietary patterns and prostate cancer risk in Western Australia (WA) using a population-based case-control study. Methods: Incident prostate cancer cases were identified via the WA Cancer Registry. Controls were sourced from the WA electoral roll, frequency matched on age. A food frequency questionnaire (FFQ) estimated usual dietary intake from 10 years earlier. Factor analysis identified dietary patterns in FFQ data. Effects of independent dietary patterns on prostate cancer risk were examined using unconditional logistic regression, adjusting for potential confounders. Results: A total of 546 cases and 447 controls provided data. Three distinct dietary patterns were identified, which we labeled vegetable, Western, and health-conscious. An increased risk for prostate cancer was observed with the Western pattern, which consisted of high intakes of red and processed meats, fried fish, hamburgers, chips, high-fat milk, and white bread. Men in the highest quartile for Western pattern score had an odds ratio of 1.82 (95% confidence interval 1.15-2.87, trend $p = 0.02$). Results were similar for aggressive cases and attenuated for non-aggressive cancers. Conclusions: A western style diet may lead to increased risks for prostate cancer, especially aggressive prostate cancer. copyright 2008 Elsevier Inc. All rights reserved.

WHAT YOU NEED TO KNOW:

This study analyzed participants' dietary patterns, which took into account the whole diet (rather than looking at specific foods or nutrients separately). The study took place in Western Australia and looked at dietary patterns and prostate cancer risk.

Participants in this study were 546 men with prostate cancer and 447 similar men without prostate cancer. All the participants filled out questionnaires that estimated dietary intake from 10 years ago; from these results the researchers were able to determine each man's dietary pattern.

Three major dietary patterns were identified in this study:

1. **Vegetable:** Diet high in many types of vegetables, jam, honey, and apples.
2. **Western:** Diet high in red and processed meats, fried fish, hamburgers, chips, high-fat milk, and white bread.
3. **Health-conscious:** Diet high in steamed, grilled, or tinned fish, chicken, rice, pasta, legumes, tofu. Also moderate amounts of bean sprouts, nuts, yogourt, ricotta cheese, and wine.

The results showed no relationship between the vegetable and health-conscious patterns and prostate cancer risk. The western pattern however, was associated with an increased risk of prostate cancer. The stronger the western dietary pattern the greater the risk of prostate cancer, especially aggressive prostate cancer.

THE BOTTOM LINE:

Men should make changes to their overall dietary patterns by moving away from the 'Western' pattern and toward patterns such as the 'vegetable' and 'health-conscious' ones described in this study.

Dewell, A, G. Weidner, M. D. Sumner, C. S. Chi and D. Ornish. **A very-Low-Fat Vegan Diet Increases Intake of Protective Dietary Factors and Decreases Intake of Pathogenic Dietary Factors.** *J Am Diet Assoc.* 2008 Feb; 1082: 347-356.

Original Abstract:

There is increasing evidence that dietary factors in plant-based diets are important in the prevention of chronic disease. This study examined protective (eg, antioxidant vitamins, carotenoids, and fiber) and pathogenic (eg, saturated fatty acids and cholesterol) dietary factors in a very-low-fat vegan diet. Ninety-three early-stage prostate cancer patients participated in a randomized controlled trial and were assigned to a very-low-fat (10% fat) vegan diet supplemented with soy protein and lifestyle changes or to usual care. Three-day food records were collected at baseline (n=42 intervention, n=43 control) and after 1 year (n=37 in each group). Analyses of changes in dietary intake of macronutrients, vitamins, minerals, carotenoids, and isoflavones from baseline to 1 year showed significantly increased intake of most protective dietary factors (eg, fiber increased from a mean of 31 to 59 g/day, lycopene increased from 8,693 to 34,464 mug/day) and significantly decreased intake of most pathogenic dietary factors (eg, saturated fatty acids decreased from 20 to 5 g/day, cholesterol decreased from 200 to 10 mg/day) in the intervention group compared to controls. These results suggest that a very-low-fat vegan diet can be useful in increasing intake of protective nutrients and phytochemicals and minimizing intake of dietary factors implicated in several chronic diseases.

WHAT YOU NEED TO KNOW:

There is more and more evidence showing that diet can help prevent chronic diseases. This study looked at positive elements in the diet, like antioxidants, carotenoids, and fiber. It also looked at negative elements in the diet such as saturated fats and cholesterol.

The participants in this study were 93 patients with early-stage prostate cancer. Half were assigned to eat a very low-fat vegan diet; the others continued to eat normally. Three-day food diaries were collected from all participants at the beginning of the study and again one year later.

The patients who ate a very low-fat vegan diet for a year showed significant increases in most of the positive dietary elements, including fiber and lycopene. They also showed significant decreases in negative dietary elements; for example saturated fats decreased from 20g to 5g per day, and cholesterol decreased from 200 mg to 10mg per day.

THE BOTTOM LINE:

A very low-fat diet can help to increase positive elements and decrease negative elements in the diet.

Gallus S, Foschi R, Negri E, et al. **Dietary zinc and prostate cancer risk: a case-control study from Italy.** *Eur Urol.* 2007 Oct;52(4):1052-1057.

Original Abstract:

Objectives: Zinc concentration is higher in the prostate than in most other tissues. Since information on the role of zinc on prostate carcinogenesis is controversial, we analysed the issue in a case-control study. **Methods:** Between 1991 and 2002, we conducted a multicentre hospital-based case-control study on prostate cancer in Italy. Cases included 1294 men with incident, histologically confirmed prostate cancer. Controls included 1451 patients admitted to the same hospitals as cases for a wide spectrum of acute non-neoplastic, non-hormone-related diseases. Zinc intake was computed from a valid and reproducible food frequency questionnaire, with the use of an Italian food composition database. Odds ratios (OR) of dietary intake of zinc and the corresponding 95% confidence intervals (CI) were estimated by unconditional multiple logistic regression models, after allowance for several covariates, including total energy. **Results:** Compared with the lowest quintile, the OR for the highest quintile was 1.56 (95% CI, 1.07-2.26), with a significant trend in risk ($p = 0.04$). The trend in risk was significant for advanced cancers only, the OR being 2.02 (95% CI, 1.14-3.59) for prostate cancers with a high Gleason score. **Conclusions:** In this large study we found a direct association between high zinc intake and prostate cancer risk, particularly for advanced cancers. Our findings allow one to exclude a favourable effect of zinc on prostate carcinogenesis. Copyright 2007 European Association of Urology.

WHAT YOU NEED TO KNOW:

There is more zinc in the prostate than in other body tissues. The role of zinc in prostate cancer is controversial; the aim of this study was to find out more about the role of zinc in prostate cancer.

This study took place in Italy between 1991 and 2002; participants were 1,294 prostate cancer patients, and 1,451 similar men without prostate cancer. All the participants filled out food questionnaires; from these the researchers estimated the amount of zinc in each participant's diet.

The results showed a direct association between high zinc intake and prostate cancer risk. In particular, high zinc intake increased the risk of advanced prostate cancers (those with a high Gleason score).

THE BOTTOM LINE:

Zinc is found in oysters, red meat, and poultry, as well as beans, legumes, seeds, and nuts. Higher amounts of zinc are ingested through oysters, meat and poultry; men should eat only moderate amounts of these foods.

Hedelin, M, E. T. Chang, F. Wiklund, et al. **Association of Frequent Consumption of Fatty Fish with Prostate Cancer Risk is Modified by COX-2 Polymorphism** *Int J Cancer*. 2007 Jan 15; 1202: 398-405.

Original Abstract:

Dietary intake of marine fatty acids from fish may protect against prostate cancer development. We studied this association and whether it is modified by genetic variation in cyclooxygenase (COX)-2, a key enzyme in fatty acid metabolism and inflammation. We assessed dietary intake of fish among 1,499 incident prostate cancer cases and 1,130 population controls in Sweden. Five single nucleotide polymorphisms (SNPs) were identified and genotyped in available blood samples for 1,378 cases and 782 controls. Odds ratios (OR) and 95% confidence intervals (CI) were estimated by multivariate logistic regression. Multiplicative and additive interactions between fish intake and COX-2 SNPs on prostate cancer risk were evaluated. Eating fatty fish (e.g., salmon-type fish) once or more per week, compared to never, was associated with reduced risk of prostate cancer (OR: 0.57, 95% CI: 0.43-0.76). The OR comparing the highest to the lowest quartile of marine fatty acids intake was 0.70 (95% CI: 0.51-0.97). We found a significant interaction ($p < 0.001$) between salmon-type fish intake and a SNP in the COX-2 gene (rs5275: +6365 T/C), but not with the 4 other SNPs examined. We found strong inverse associations with increasing intake of salmon-type fish among carriers of the variant allele (OR for once per week or more vs. never = 0.28, 95% CI: 0.18-0.45; $p(\text{trend}) < 0.01$), but no association among carriers of the more common allele. Frequent consumption of fatty fish and marine fatty acids appears to reduce the risk of prostate cancer, and this association is modified by genetic variation in the COX-2 gene.

WHAT YOU NEED TO KNOW:

Fatty acids in fish may protect against prostate cancer development. This study examined this link, and whether it is affected by genetic variations in (COX)-2, a key enzyme in fatty acid metabolism and inflammation.

Participants in the study were 1,499 men with prostate cancer and 1,130 men without prostate cancer. The researchers calculated how much fish the men ate; they also identified 5 genetic variations in the participants' blood samples.

Compared with those who never ate fatty fish (like Salmon), those who ate fatty fish once or more per week had a lower risk (43%) of prostate cancer. Only one of the genetic variations showed a significant interaction with fatty fish intake; men with this genetic variation who ate fatty fish at least once per week showed a 72% lower risk of prostate cancer.

THE BOTTOM LINE:

Men should eat fatty fish like salmon at least once per week to reduce risk of prostate cancer.

Kirsh, VA, U. Peters, S. T. Mayne, et al. **Prospective Study of Fruit and Vegetable Intake and Risk of Prostate Cancer.** *J Natl Cancer Inst.* 2007 01 Aug; 9915: 1200-1209.

Original Abstract:

Background: Several epidemiologic studies have reported associations between fruit and vegetable intake and reduced risk of prostate cancer, but the findings are inconsistent and data on clinically relevant advanced prostate cancer are limited. Methods: We evaluated the association between prostate cancer risk and intake of fruits and vegetables in 1338 patients with prostate cancer among 29361 men (average follow-up = 4.2 years) in the screening arm of the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial. Participants completed both a general risk factor and a 137-item food-frequency questionnaire at baseline. Cox proportional hazards models were used to estimate relative risks (RRs) and 95% confidence intervals (CIs). All statistical tests were two-sided. Results: Vegetable and fruit consumption was not related to prostate cancer risk overall; however, risk of extraprostatic prostate cancer (stage III or IV tumors) decreased with increasing vegetable intake (RR = 0.41, 95% CI = 0.22 to 0.74, for high versus low intake; Ptrend = .01). This association was mainly explained by intake of cruciferous vegetables (RR = 0.60, 95% CI = 0.36 to 0.98, for high versus low intake; Ptrend = .02), in particular, broccoli (RR = 0.55, 95% CI = 0.34 to 0.89, for >1 serving per week versus = .02), in particular, broccoli (RR = 0.55, 95% CI = 0.34 to 0.89, for >1 serving per week versus trend = .02) and cauliflower (RR = 0.48, 95% CI = 0.25 to 0.89 for >1 serving per week versus = .02) and cauliflower (RR = 0.48, 95% CI = 0.25 to 0.89 for >1 serving per week versus trend = .03). We found some evidence that risk of aggressive prostate cancer decreased with increasing spinach consumption, but the findings were not consistently statistically significant when restricted to extraprostatic disease. Conclusion: High intake of cruciferous vegetables, including broccoli and cauliflower, may be associated with reduced risk of aggressive prostate cancer, particularly extraprostatic disease. copyright The Author 2007. Published by Oxford University Press 2007.

WHAT YOU NEED TO KNOW:

Several studies have reported a reduced risk of prostate cancer for those who eat more fruits and vegetables. However, these findings have been inconsistent and there is not much data on advanced prostate cancer.

Participants in this study were 1,338 patients with prostate cancer; they completed risk factor and food questionnaires.

The results showed no association between fruit and vegetable intake and overall prostate cancer risk. However, men who ate more vegetables, particularly cruciferous vegetables like broccoli and cauliflower were less likely to have advanced prostate cancer.

THE BOTTOM LINE:

Eating lots of cruciferous vegetables, including broccoli and cauliflower, may reduce risk of aggressive and advanced prostate cancer.

Ornish D, Magbanua MJ, Weidner G, Weinberg V, Kemp C, Green C, Mattie MD, Marlin R, Simko J, Shinohara K, Haqq CM, Carroll PR. **Changes in Prostate Gene Expression in Men Undergoing an Intensive Nutrition and Lifestyle Intervention.** *Proc Natl Acad Sci U S A.* 2008 Jun 17; 10524: 8369-8374.

Original Abstract:

Epidemiological and prospective studies indicate that comprehensive lifestyle changes may modify the progression of prostate cancer. However, the molecular mechanisms by which improvements in diet and lifestyle might affect the prostate microenvironment are poorly understood. We conducted a pilot study to examine changes in prostate gene expression in a unique population of men with low-risk prostate cancer who declined immediate surgery, hormonal therapy, or radiation and participated in an intensive nutrition and lifestyle intervention while undergoing careful surveillance for tumor progression. Consistent with previous studies, significant improvements in weight, abdominal obesity, blood pressure, and lipid profile were observed (all $P < 0.05$), and surveillance of low-risk patients was safe. Gene expression profiles were obtained from 30 participants, pairing RNA samples from control prostate needle biopsy taken before intervention to RNA from the same patient's 3-month postintervention biopsy. Quantitative real-time PCR was used to validate array observations for selected transcripts. Two-class paired analysis of global gene expression using significance analysis of microarrays detected 48 up-regulated and 453 down-regulated transcripts after the intervention. Pathway analysis identified significant modulation of biological processes that have critical roles in tumorigenesis, including protein metabolism and modification, intracellular protein traffic, and protein phosphorylation (all $P < 0.05$). Intensive nutrition and lifestyle changes may modulate gene expression in the prostate. Understanding the prostate molecular response to comprehensive lifestyle changes may strengthen efforts to develop effective prevention and treatment. Larger clinical trials are warranted to confirm the results of this pilot study.

WHAT YOU NEED TO KNOW:

Studies have shown that dramatic lifestyle changes can slow the progression of prostate cancer; however, it is not known exactly how this occurs.

The aim of this study was to examine changes in the genes of the prostate of a select group of men. The 30 participants were men with low-risk prostate cancer who chose not to be treated with surgery, hormonal therapy or radiation. Instead these men participated in an intensive nutrition and lifestyle program while being monitored for progression of their prostate cancer. Prostate biopsies were taken from the participants at the beginning of the study, and again 3 months after the lifestyle program.

The results showed significant improvements in weight, abdominal obesity, blood pressure, and cholesterol. Many changes in gene expression were found in the prostate tissue after the lifestyle program. Over 500 genes were influenced in ways that reduced tumour development and normalized other biological processes (changes in the body's cells). The researchers were also able to identify some of the processes that were involved in tumour growth. Further research is needed in this area to help develop effective prevention and treatment strategies for prostate cancer.

THE BOTTOM LINE:

Intensive lifestyle and nutrition changes can change the way genes act in prostate tissue, possibly slowing the growth of prostate cancer.

Parsons, JK, V. A. Newman, J. L. Mohler, J. P. Pierce, S. Flatt and J. Marshall. **Dietary Modification in Patients with Prostate Cancer on Active Surveillance: A Randomized, Multicentre Feasibility Study.** *BJU Int.* 2008 May; 10110: 1227-1231.

Original Abstract:

OBJECTIVES: To evaluate the feasibility of implementing a diet-based intervention in men with prostate cancer on active surveillance, as changes in diet might potentially inhibit the progression of prostate cancer. **PATIENTS AND METHODS:** As part of the Men's Eating and Living (MEAL) Study (a multicentre pilot trial of a diet-based intervention for prostate cancer) 43 men aged 50-80 years with prostate cancer and on active surveillance were randomized to receive either telephone-based dietary counselling or standardized, written nutritional information. Telephone counselling targets included increased intakes of vegetables (particularly cruciferous vegetables and tomato products), whole grains, and beans/legumes. Dietary intakes and plasma carotenoid levels were assessed at baseline and at after 6 months. **RESULTS:** In the intervention arm the mean daily intakes of total vegetables, crucifers and tomato products increased by 71%, 180% and 265%, respectively ($P < 0.05$); in the control arm there were no significant changes in mean intakes of these components. Similarly, in the intervention arm, mean plasma levels of alpha-carotene, beta-carotene, lutein, lycopene and total carotenoids increased by 37%, 32%, 23%, 30% and 25%, respectively ($P < 0.05$); in the control arm there were no significant changes in plasma levels of these components. There were no significant changes in either group in whole grain, beans/legumes, or fat intake. **CONCLUSIONS:** Telephone-based dietary counselling increases vegetable intake and plasma concentrations of potentially anticarcinogenic carotenoids in men with prostate cancer on active surveillance. These data support the feasibility of implementing clinical trials of diet-based interventions in this population.

WHAT YOU NEED TO KNOW:

Changes in diet may prevent early-stage prostate cancer from progressing. The objective of this study was to determine if it would be beneficial for men with prostate cancer on active surveillance (watch and wait) to participate in diet-based interventions.

Participants in this study were 43 men ages 50 to 80 years on active surveillance for prostate cancer. Half the men received telephone-based diet counselling, and the others received standard written nutritional information (control group). Those who received telephone counselling were encouraged to eat more tomato products, whole grains, beans & legumes, and vegetables (especially cruciferous vegetables like broccoli, cauliflower, kale, etc.). All participants gave dietary information and had blood levels of carotenoids (plant pigments found in red and yellow fruits and vegetables) measured before the study and again six months later.

Men who received telephone counseling ate:

- ❖ 71% more vegetables
- ❖ 180% more cruciferous vegetables
- ❖ 265% more tomato products

They also showed an increase in blood levels of carotenoids. The men who received only written information showed no significant changes in diet or carotenoid blood levels.

THE BOTTOM LINE:

Targeted telephone counselling can increase the amounts of vegetables and tomato products that men with prostate cancer eat, and prevent their disease from progressing.

Traka, M, Gasper, AV - Melchini, A, et al. **Broccoli Consumption Interacts with GSTM1 to Perturb Oncogenic Signalling Pathways in the Prostate.** *PLoS ONE* 2008 Jul 2;3(7):e2568.

Original Abstract:

Background: Epidemiological studies suggest that people who consume more than one portion of cruciferous vegetables per week are at lower risk of both the incidence of prostate cancer and of developing aggressive prostate cancer but there is little understanding of the underlying mechanisms. In this study, we quantify and interpret changes in global gene expression patterns in the human prostate gland before, during and after a 12 month broccoli-rich diet. **Methods and Findings:** Volunteers were randomly assigned to either a broccoli-rich or a pea-rich diet. After six months there were no differences in gene expression between glutathione S-transferase mu 1 (GSTM1) positive and null individuals on the pea-rich diet but significant differences between GSTM1 genotypes on the broccoli-rich diet, associated with transforming growth factor beta 1 (TGF β 1) and epidermal growth factor (EGF) signalling pathways. Comparison of biopsies obtained pre and post intervention revealed more changes in gene expression occurred in individuals on a broccoli-rich diet than in those on a pea-rich diet. While there were changes in androgen signalling, regardless of diet, men on the broccoli diet had additional changes to mRNA processing, and TGF β 1, EGF and insulin signalling. We also provide evidence that sulforaphane (the isothiocyanate derived from 4-methylsulphanylbutyl glucosinolate that accumulates in broccoli) chemically interacts with TGF β 1, EGF and insulin peptides to form thioureas, and enhances TGF β 1/Smad-mediated transcription. **Conclusions:** These findings suggest that consuming broccoli interacts with GSTM1 genotype to result in complex changes to signalling pathways associated with inflammation and carcinogenesis in the prostate. We propose that these changes may be mediated through the chemical interaction of isothiocyanates with signalling peptides in the plasma. This study provides, for the first time, experimental evidence obtained in humans to support observational studies that diets rich in cruciferous vegetables may reduce the risk of prostate cancer and other chronic disease.

WHAT YOU NEED TO KNOW:

Studies suggest that people who consume more than one serving of cruciferous vegetables (e.g. broccoli, cauliflower, kale, cabbage, etc.) per week have a lower risk of prostate cancer. It's possible that some compounds found in cruciferous vegetables make changes in the body's genes that help fight cancer.

In this study volunteers were randomly assigned to one of two groups. One group ate 4 extra servings of broccoli per week; the other ate 4 extra servings of peas per week. The researchers took prostate biopsies of the men before, during, and after the study and compared them to one another.

The results showed that men who ate a broccoli-rich diet showed more genetic changes than those who ate a pea-rich diet. These findings suggest that a diet rich in broccoli can produce genetic changes in the prostate that may reduce the risk of cancer.

THE BOTTOM LINE:

Men should eat several extra servings of cruciferous vegetables such as broccoli, cauliflower, kale, cabbage, etc., each week to reduce the risk of prostate cancer.

Obesity

Courneya, Kerry S. C, Peter T. Katzmarzyk and Eric Bacon. **Physical Activity and Obesity in Canadian Cancer Survivors: Population-Based Estimates from the 2005 Canadian Community Health Survey** *CANCER*. 2008 June 1, 2008; 112:11: 2475-2482.

Original Abstract:

BACKGROUND. Physical inactivity and obesity are associated with poorer disease outcomes in several cancer survivor groups. Few studies, however, have provided population-based estimates of these risk factors in cancer survivors and compared them with individuals without a history of cancer. Here such estimates for the Canadian population are reported. **METHODS.** Data were obtained from the 2005 Canadian Community Health Survey consisting of computer-assisted interviews of 114,355 adults representing an estimated 23,285,548 Canadians. Participants self-reported their cancer history, height, and body weight to calculate body mass index and participation in various leisure-time activities. **RESULTS.** Fewer than 22% of Canadian cancer survivors were physically active and over 18% were obese. Few differences were observed between cancer survivors and those without a history of cancer except that: 1) prostate cancer survivors were more likely to be active (adjusted odds ratio [OR] 5 1.27; 95% confidence interval [CI] 5 1.01–1.59) and less likely to be obese (adjusted OR 5 0.71; 95% CI 5 0.56– 0.90); 2) skin cancer survivors (nonmelanoma and melanoma) were more likely to be active (adjusted OR 5 1.33; 95% CI 5 1.12–1.59); and 3) obese breast cancer survivors were less likely to be active compared with obese women without a history of cancer (adjusted OR 5 0.51; 95% CI 5 0.27–0.94). **CONCLUSIONS.** Canadian cancer survivors have low levels of physical activity and a high prevalence of obesity that, although comparable to the general population, may place them at higher risk for poorer disease outcomes. Population-based interventions to increase physical activity and promote a healthy body weight in Canadian cancer survivors are warranted. *Cancer* 2008;112:2475–82. © 2008 American Cancer Society.

WHAT YOU NEED TO KNOW:

Lack of physical activity and obesity are associated with worse disease outcome in some cancer survivors. This Canadian population study looked at physical activity levels of cancer survivors and compared them to people without a history of cancer.

Data was gathered through computer-assisted interviews of 114,355 adults, representing an estimated 23,285,548 Canadians. Participants reported their cancer history, height, body weight, and various leisure activities.

The results showed that less than 22% of Canadian cancer survivors were physically active, and over 18% were obese. There were not many differences between cancer survivors and those without a history of cancer, except for the following 3:

- ❖ Prostate cancer survivors were more likely to be active and less likely to be obese.
- ❖ Skin cancer survivors were more likely to be active.
- ❖ Obese breast cancer survivors were less likely to be active compared with obese women without a history of cancer

Canadian cancer survivors have low levels of physical activity and high obesity rates that put them at higher risk of poor disease outcomes.

THE BOTTOM LINE:

Canadian cancer survivors should participate in physical activity and maintain a healthy body weight to stay healthy.

Efstathiou, JA, K. Bae, W. U. Shipley, et al. **Obesity and Mortality in Men with Locally Advanced Prostate Cancer: Analysis of RTOG 85-31.** *Cancer.* 2007 Dec 15; 11012: 2691-2699.

Original Abstract:

BACKGROUND: Greater body mass index (BMI) is associated with shorter time to prostate-specific antigen (PSA) failure following radical prostatectomy and radiation therapy (RT). Whether BMI is associated with prostate cancer-specific mortality (PCSM) was investigated in a large randomized trial of men treated with RT and androgen deprivation therapy (ADT) for locally advanced prostate cancer. **METHODS:** Between 1987 and 1992, 945 eligible men with locally advanced prostate cancer were enrolled in a phase 3 trial (RTOG 85-31) and randomized to RT and immediate goserelin or RT alone followed by goserelin at recurrence. Height and weight data were available at baseline for 788 (83%) subjects. Cox regression analyses were performed to evaluate the relations between BMI and all-cause mortality, PCSM, and nonprostate cancer mortality. Covariates included age, race, treatment arm, history of prostatectomy, nodal involvement, Gleason score, clinical stage, and BMI. **RESULTS:** The 5-year PCSM rate for men with BMI or =25 to or =30, respectively (Gray's P = .005). In multivariate analyses, greater BMI was significantly associated with higher PCSM (for BMI > or =25 to or =30, HR 1.64, 95% CI, 1.01-2.66, P = .04). BMI was not associated with nonprostate cancer or all-cause mortality. **CONCLUSIONS:** Greater baseline BMI is independently associated with higher PCSM in men with locally advanced prostate cancer. Further studies are warranted to evaluate the mechanism(s) for increased cancer-specific mortality and to assess whether weight loss after prostate cancer diagnosis alters disease course. 2007 American Cancer Society

WHAT YOU NEED TO KNOW:

Men with a higher body mass index (body fatness) have a greater risk of PSA failure (prostate cancer recurrence) after radical prostatectomy and radiation therapy. The aim of this study was to determine if obese men also have a higher risk of dying from prostate cancer.

Participants in this study were 945 men with locally advanced prostate cancer (cancer that has spread to the tissue surrounding the prostate). All the men were treated with radiation therapy. Half the men also received goserelin (a hormonal treatment that stops the production of testosterone) at the time of treatment; the others received it when their cancer recurred. Researchers looked at the participants' body mass index and risk of dying from prostate cancer and other causes.

The results showed that higher body mass index was significantly associated with death from prostate cancer. There was no association between body mass index and other causes of death. Further studies are needed to determine the reason for this, and to determine if weight loss after cancer diagnosis would improve prognosis.

THE BOTTOM LINE:

Men with higher body mass index (obesity) are at greater risk of dying from locally advanced prostate cancer.

Freedland, SJ, Leon Sun, Christopher J. Kane, et al. **Obesity and Oncological Outcome After Radical Prostatectomy: Impact of Prostate-Specific Antigen-Based Prostate Cancer Screening: Results from the Shared Equal Access Regional Cancer Hospital and Duke Prostate Center Databases** *BJU Int.* 2008 Aug 7.

Original Abstract:

To indirectly test the hypothesis that prostate-specific antigen (PSA)-based screening is biased against obese men due to haemodilution of PSA, and thus results in delayed diagnosis and poorer outcome beyond the biological link between obesity and aggressive prostate cancer. We sought to examine the association between body mass index (BMI) and the outcome of radical prostatectomy (RP) separately for men with PSA-detected cancers (cT1c) or with abnormal digital rectal examination (DRE) findings (cT2/T3), and stratified by year of treatment, using two large databases. We conducted a retrospective cohort study of 1375 and 2014 men treated by RP between 1988 and 2007 using the Shared Equal Access Regional Cancer Hospital (SEARCH) and Duke Prostate Center (DPC) databases. We evaluated the association between BMI and adverse pathological features and biochemical progression, using logistic regression and Cox proportional hazards models, adjusting for several clinical characteristics, respectively. Data were examined as a whole and as stratified by clinical stage (cT1c vs cT2/T3) and year of surgery (22652000 vs 0.3). Among men with T1c disease, the association between BMI and biochemical progression was limited to men treated in 2000 or later ($P = 0.002$) and was not apparent in men treated before 2000 ($P > 0.4$). Obese men with PSA-detected cancers and treated with RP since 2000 were at significantly greater risk of biochemical progression, while obese men treated before 2000 or diagnosed with an abnormal DRE were not at significantly greater risk of progression. These findings support the hypothesis that current PSA-based screening is less effective at finding cancers in obese men, leading to more aggressive tumours at diagnosis. Lowering the PSA threshold for biopsy among obese men might help to improve outcomes among this high-risk group.

WHAT YOU NEED TO KNOW:

The aim of this study was to test the idea that prostate-specific antigen (PSA) screening is less effective in obese men. Because of their higher blood volumes, PSA levels in obese men may be diluted, resulting in delayed cancer diagnosis and worse prognosis.

Researchers examined the records of 3,389 men treated for prostate cancer with radical prostatectomy between 1988 and 2007; they looked at body mass index (body fatness) and the progression of cancer. They compared men who were diagnosed through PSA testing, and men who were diagnosed through digital rectal exam; they also looked at year of surgery.

The results showed that obese prostate cancer patients who were diagnosed using PSA testing since the year 2000 were at a significantly higher risk of recurrence. Obese men who were treated before 2000 or diagnosed using digital rectal exam did not share this higher risk of recurrence.

Current PSA screening is less effective at detecting cancers in obese men, leading to more aggressive tumours at diagnosis. Lowering the maximum PSA requirement for biopsy for obese men might help improve prognosis.

THE BOTTOM LINE:

PSA screening is less effective in obese men, leading to delayed diagnosis and worse prognosis.

Gong, Z, I. Agalliu, D. W. Lin, J. L. Stanford and A. R. Kristal. **Obesity is Associated with Increased Risks of Prostate Cancer Metastasis and Death After Initial Cancer Diagnosis in Middle-Aged Men** *Cancer*. 2007 Mar 15; 1096: 1192-1202.

Original Abstract:

BACKGROUND: Current research is inconclusive regarding the effect of obesity on outcomes after a prostate cancer diagnosis. The objective of this study was to examine associations between obesity and the risks of developing metastasis or prostate cancer-specific mortality in a population-based cohort of men with prostate cancer. **METHODS:** Seven hundred fifty-two middle-aged men with prostate cancer who were enrolled in a case-control study and remain under long-term follow-up for disease progression and mortality formed the study cohort. Body mass index (BMI) in the year before diagnosis was obtained at the time of initial interview. Cox proportional hazards models were used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs) of prostate cancer metastasis and mortality associated with obesity, controlling for age, race, smoking status, Gleason score, stage at diagnosis, diagnostic prostate-specific antigen level, and primary treatment. **RESULTS:** Obesity (BMI ≥ 30 kg/m²) was associated with a significant increase in prostate cancer mortality (HR, 2.64; 95% CI, 1.18-5.92). Among men who were diagnosed with local- or regional-stage disease, obesity also was associated with an increased risk of developing metastasis (HR, 3.61; 95% CI, 1.73-7.51). Associations generally were consistent across strata defined by Gleason score (2-6 or 7 [3 + 4] vs 7 [4 + 3] or 8-10), stage (local vs regional/distant for mortality), and primary treatment (androgen-deprivation therapy use: yes vs no). **CONCLUSIONS:** Obesity at the time of diagnosis was associated with increased risks of prostate cancer metastasis and death. The increased risk of prostate cancer death or metastasis associated with obesity largely was independent of key clinical prognostic factors at diagnosis.

WHAT YOU NEED TO KNOW:

Currently researchers are not certain whether prostate cancer treatment is as effective in obese men as it is in normal weight men. This study of prostate cancer patients examined the link between obesity and risk of death from prostate cancer, or having the cancer spread.

752 men were enrolled in this study. Body mass index (body fatness) was calculated at the beginning of the study. After controlling for other factors (age, race, smoking status, Gleason score, cancer stage, PSA levels, treatment) researchers determined that obesity was significantly related to death from prostate cancer. Obese men with early stage cancer were also at an increased risk of having the cancer spread.

THE BOTTOM LINE:

Obese men are more likely to have their cancer spread and to die of prostate cancer.

Psychosocial

Molton, IR, Scott D. Siegel, Frank J. Penedo, et al. **Promoting Recovery of Sexual Functioning After Radical Prostatectomy with Group-Based Stress Management: The Role of Interpersonal Sensitivity** *J Psychosom Res.* 2008 05; 645: 527-536.

Original Abstract:

Objective: Treatment for localized prostate carcinoma (PCa) is frequently associated with decrements in sexual functioning and satisfaction. Given the highly interpersonal nature of these decrements, interpersonal problems (such as interpersonal sensitivity) may affect recovery of sexual functioning after PCa treatment through interference with physician and partner communication and through distorted cognitions surrounding sexual dysfunction. The objective of the present study was to determine the effect of interpersonal sensitivity on several treatment indicators, including response to a group-based psychosocial intervention. Methods: Participants were 101 older men recovering from radical prostatectomy who were enrolled in a randomized controlled trial of a 10-week group-based cognitive-behavioral stress management (CBSM) intervention. Measures included the Inventory of Interpersonal Problems and the sexual functioning subscale of the University of California- Los Angeles quality-of-life measure. Results: At baseline, interpersonal sensitivity was related to a belief linking sexual dysfunction to core male identity ($r=.29, P<.05$). Using hierarchical regression, we found that (a) the CBSM intervention was effective in promoting sexual recovery in all participants, and (b) this effect was moderated by interpersonal sensitivity, such that individuals with higher levels of interpersonal sensitivity made larger improvements in sexual functioning in response to CBSM. Conclusions: CBSM was effective in improving sexual function after radical prostatectomy. Individuals with higher levels of interpersonal sensitivity were more likely to perceive sexual dysfunction as a threat to masculine identity and made larger gains in the CBSM intervention. Results and relevance to the older male cancer patients are discussed from the perspective of interpersonal theory.

- ❖ **Note:** *Interpersonal Sensitivity* is a personality trait; people high in interpersonal sensitivity are "too sensitive" to others; they perceive that people are being critical toward them and may feel rejected and abandoned.

WHAT YOU NEED TO KNOW:

Treatment for early stage prostate cancer often results in a decrease in sexual function and satisfaction. Given that sexual problems are highly personal in nature, psychological factors can influence the recovery of normal sexual function after prostate cancer treatment. Communication between a patient high in 'interpersonal sensitivity' and his physician, partner, and others may be distorted because of the way people with this trait perceive the reactions of the people around them.

Participants in this study were 101 older men recovering from radical prostatectomy; approximately half were assigned to participate in a 10-week group-based program that emphasized coping and stress-management. The others were assigned to the control group (no program). Before the program all participants filled out questionnaires about interpersonal problems and sexual functioning.

The results showed that men high in interpersonal sensitivity were much more likely to perceive sexual dysfunction as a threat to male identity. The 10 week program was effective in helping all the participants recover sexual function; moreover, the program was especially beneficial to patients high in interpersonal sensitivity.

THE BOTTOM LINE:

Group-based psychological interventions can help men recover sexual function after radical prostatectomy.

Steginga, SK, M. Ferguson, S. Clutton, R. A. Gardiner and D. Nicol. **Early Decision and Psychosocial Support Intervention for Men with Localised Prostate Cancer: An Integrated Approach.** *Supportive Care in Cancer*. 2008 Jul; 167: 821-829.

Original Abstract:

Goal: Men diagnosed with prostate cancer experience high decision-related distress concurrent with cancer-related distress. Psycho-education, problem solving and decision support were integrated in a novel telephone-delivered supportive care intervention targeting men at diagnosis and assessed for feasibility. Materials and Methods: An exploratory single-group pre-post-test design tracked session frequency, duration and content. Standardised measures assessed decisional conflict, cancer-related distress and decision involvement. Brief screening measures for psychological and decision-related distress were incorporated into the intervention protocol. Twenty men (77% response) newly diagnosed with localised prostate cancer received the intervention. Results: Men who were undecided about treatment at study entry required more pre-treatment intervention calls ($p < 0.013$). Pre-treatment support calls were longer ($M = 40.2$ min) and more complex by comparison to post-treatment calls ($M = 30.9$ min; $p < 0.002$). Brief screening for decision-related distress correlated with concurrent ($p < 0.008$) and prospective ($p < 0.046$) decisional conflict. Decisional conflict and intrusion decreased at post-test ($p < 0.001$; $p < 0.005$). Men reported a high level of satisfaction with the support received with benefits identified including anonymity and accessibility. Conclusions: In this setting, a tele-based supportive care and decision support intervention for men newly diagnosed with prostate cancer was feasible. The use of brief screening measures as within-intervention clinical tools appears promising. copyright 2007 Springer-Verlag.

WHAT YOU NEED TO KNOW:

Men diagnosed with prostate cancer often experience distress related to treatment decision making, along with cancer-related distress. This study tested a telephone-based support program for men when they were first diagnosed. The study provided educational, problem solving, psychological, and decision-making support over the telephone to the participants.

At the beginning of the study, researchers assessed decisional conflict (trouble making decisions about treatment), their involvement in decision-making, decision-making distress, as well as psychological and cancer-related distress. The participants were 20 men newly diagnosed with localized (early stage) prostate cancer.

The results were as follows:

- ❖ Men who were undecided about treatment at the beginning of the study required more calls pre-treatment.
- ❖ Pre-treatment (40 min.) calls were longer and more complex than post-treatment (31 min.) calls.
- ❖ Decisional conflict was much lower at the end of the study.
- ❖ Men were highly satisfied with the telephone support; benefits included convenience and anonymity.

THE BOTTOM LINE:

Telephone support can be useful for men newly diagnosed with prostate cancer, particularly when patients are making treatment decisions.

Quality of Life

Sanda, MG, R. L. Dunn, J. Michalski, et al. **Quality of Life and Satisfaction with Outcome among Prostate-Cancer Survivors.** *N Engl J Med.* 2008 Mar 20; 358(12): 1250-1261.

Original Abstract:

BACKGROUND: We sought to identify determinants of health-related quality of life after primary treatment of prostate cancer and to measure the effects of such determinants on satisfaction with the outcome of treatment in patients and their spouses or partners. **METHODS:** We prospectively measured outcomes reported by 1201 patients and 625 spouses or partners at multiple centers before and after radical prostatectomy, brachytherapy, or external-beam radiotherapy. We evaluated factors that were associated with changes in quality of life within study groups and determined the effects on satisfaction with the treatment outcome. **RESULTS:** Adjuvant hormone therapy was associated with worse outcomes across multiple quality-of-life domains among patients receiving brachytherapy or radiotherapy. Patients in the brachytherapy group reported having long-lasting urinary irritation, bowel and sexual symptoms, and transient problems with vitality or hormonal function. Adverse effects of prostatectomy on sexual function were mitigated by nerve-sparing procedures. After prostatectomy, urinary incontinence was observed, but urinary irritation and obstruction improved, particularly in patients with large prostates. No treatment-related deaths occurred; serious adverse events were rare. Treatment-related symptoms were exacerbated by obesity, a large prostate size, a high prostate-specific antigen score, and older age. Black patients reported lower satisfaction with the degree of overall treatment outcomes. Changes in quality of life were significantly associated with the degree of outcome satisfaction among patients and their spouses or partners. **CONCLUSIONS:** Each prostate-cancer treatment was associated with a distinct pattern of change in quality-of-life domains related to urinary, sexual, bowel, and hormonal function. These changes influenced satisfaction with treatment outcomes among patients and their spouses or partners. Copyright 2008 Massachusetts Medical Society.

WHAT YOU NEED TO KNOW:

The aim of this study was to determine which are important factors in the quality of life (QOL) of prostate cancer patients after treatment. This study also measured the effects of the QOL elements on patient and spouse satisfaction with treatment outcomes.

Participants were 1,201 patients treated with radical prostatectomy, brachytherapy, or external-beam radiotherapy, and 625 spouses. The researchers gathered data from all participants before and after treatment to find out which factors were associated with changes in quality of life and satisfaction with treatment outcome.

The following results were found:

- ❖ Patients who received hormone therapy in addition to brachytherapy or radiotherapy had worse quality of life.
- ❖ Some patients who received brachytherapy reported having long-lasting urinary irritation, bowel and sexual symptoms, and short-term problems with hormonal function.
- ❖ Some patients who received prostatectomy had urinary incontinence; however, urinary irritation and obstruction improved, especially in patients with large prostates.
- ❖ Sexual function problems were reported in men who received prostatectomy; however the nerve-sparing procedure lessened this effect.
- ❖ Treatment related symptoms were made worse by obesity, large prostate size, high PSA score and older age.
- ❖ Black patients were less satisfied with overall treatment outcomes.

THE BOTTOM LINE:

Specific prostate cancer treatment can negatively affect quality of life in patients in different ways, leading to dissatisfaction with treatment outcomes.

van de Poll-Franse, LV, L. Kwan, R. E. Reiter, S. P. Lee and M. S. Litwin. **The Influence of Cardiovascular Disease on Health Related Quality of Life in Men with Prostate Cancer: A 4-Year Followup Study.** *J Urol.* 2008 discussion 1367; Apr; 1794: 1362-1367.

Original Abstract:

PURPOSE: Presence of comorbid conditions has consistently been associated with less aggressive treatment and worse overall survival in men with prostate cancer. However, little is known about the impact of comorbidity on health related quality of life outcomes, which may help men and their physicians facing decisions on primary treatment. **MATERIALS AND METHODS:** We evaluated patterns of health related quality of life in men with both prostate cancer and cardiovascular disease during 4 years of followup in a cohort of 475 prostate cancer survivors. We measured generic and disease specific health related quality of life at diagnosis and 11 times afterward. Repeated measures analyses with mixed modeling were used to examine changes in health related quality of life in subjects with cardiovascular disease and compare outcomes with those of an age, stage and treatment matched sample without cardiovascular disease. **RESULTS:** Men with cardiovascular disease had worse baseline physical health related quality of life ($p = 0.003$) and showed worse scores over time in this domain than did matched controls ($p = 0.003$). We found no significant interaction between treatment and cardiovascular disease on physical health related quality of life outcomes, suggesting that cardiovascular disease had the same detrimental effect on health related quality of life in this specific domain for radical prostatectomy, brachytherapy or external beam radiotherapy. The negative effect of cardiovascular disease on physical health related quality of life over time appeared to be stronger for those with worse baseline scores. The presence of cardiovascular disease was also associated with worse baseline sexual function ($p = 0.004$) and a trend toward worse scores over time ($p = 0.07$). **CONCLUSIONS:** Our observations suggest that patients with prostate cancer with cardiovascular disease have worse physical and sexual health related quality of life before and following treatment.

WHAT YOU NEED TO KNOW:

Prostate cancer patients with other medical conditions usually receive less aggressive treatment and have worse overall survival. Not much is known about the impact of other medical conditions on quality of life; however, this may be useful in helping men and their doctors make treatment decisions.

This study looked at patterns of health related quality of life in men with both prostate cancer and cardiovascular disease. Participants were 475 men followed for 4 years after prostate cancer treatment. The researchers measured quality of life in the men when they were diagnosed with prostate cancer (baseline), and 11 more times over the next 4 years. These results were then compared with a similar group of men with prostate cancer but without cardiovascular disease (control group).

Men with cardiovascular disease showed worse quality of life at the beginning of the study, worse sexual function and worse scores over time than the control group. Treatment choice did not have an impact on quality of life; men who received radical prostatectomy, brachytherapy or external beam radiotherapy all had similar quality of life issues.

THE BOTTOM LINE:

Patients with both prostate cancer and cardiovascular disease have worse physical and sexual quality of life before and during treatment.

Qigong

Oh, B, P. Butow, B. Mullan and S. Clarke. **Medical Qigong for Cancer Patients: Pilot Study of Impact on Quality of Life, Side Effects of Treatment and Inflammation.** *Am J Chin Med.* 2008 363: 459-472.

Original Abstract:

Quality of life (QOL) of cancer patients is often diminished due to the side effects of treatment and symptoms of the disease itself. Medical Qigong (coordination of gentle exercise and relaxation through meditation and breathing exercise based on Chinese medicine theory of energy channels) may be an effective therapy for improving QOL, symptoms and side effects, and longevity of cancer patients. In this pilot study, the feasibility, acceptability, and impact of Medical Qigong (MQ) were evaluated on outcomes in cancer patients. Thirty patients diagnosed with heterogeneous cancers, were randomly assigned to two groups: a control group that received usual medical care and an intervention group who participated in a MQ program for 8 weeks in addition to receiving usual medical care. Randomization was stratified by completion of cancer treatment (n = 14) or under chemotherapy (n = 16). Patients completed measures before and after the program. Quality of life and symptoms were measured by the EORTC QLQ-C 30 and progress of disease by the inflammation biomarker (CRP: c-reactive protein) via a blood test was assessed. The MQ intervention group reported clinically significant improved global QOL scores pre- and post-intervention. The MQ intervention also reduced the symptoms of side effects of cancer treatment and inflammation biomarker (CRP) compare to the control group. Due to the small sample size, however, the results were not statistically significant between treatment and the control groups. Data from the pilot study suggest that MQ with usual medical treatment can enhance the QOL of cancer patients and reduce inflammation. This study needs a further investigation with a larger sample size. copyright 2008 World Scientific Publishing Company.

WHAT YOU NEED TO KNOW:

Cancer patients often have a reduced quality of life, due to symptoms of the disease and treatment side effects. Medical Qigong (gentle exercise and relaxation through meditation and breathing exercises based on the Chinese medicine theory of energy channels) may help improve QOL, symptoms and side effects in cancer patients.

Participants in this study were 30 patients with different types of cancer. Half participated in a Medical Qigong group for 8 weeks in addition to their regular medical care. The other half made up the control group and simply received their usual medical care. Before and after the program researchers measured quality of life and cancer symptoms in the participants; they also took blood tests to measure inflammation in the body.

The group that participated in medical qigong showed significantly improved quality of life after the 8-week program; this group also had reduced treatment side effects and reduced inflammation. This small study showed promising results; however, it would be useful to do another study with more participants in order to produce more significant results.

THE BOTTOM LINE:

Medical Qigong along with usual medical treatment can enhance the quality of life of cancer patients and reduce treatment side effects and inflammation.

Treatment Decisions

Chen, RC, J. A. Clark, J. Manola and J. A. Talcott. **Treatment 'Mismatch' in Early Prostate Cancer: Do Treatment Choices Take Patient Quality of Life into Account?**. *Cancer*. 2008 01 Jan; 1121: 61-68.

Original Abstract:

BACKGROUND. Pretreatment urinary, bowel, and sexual dysfunction may increase the toxicity of prostate cancer treatments or preclude potential benefits. Using patient-reported baseline dysfunction from a prospective cohort study, we determined the proportion of patients receiving relatively contraindicated ('mismatched') treatments. **METHODS.** Baseline obstructive uropathy and bowel dysfunction relatively contraindicate brachytherapy (BT) and external beam radiation therapy (EBRT), respectively, because they increase patients' vulnerability to treatment-related toxicity. Baseline sexual dysfunction renders moot the intended benefit of nerve-sparing radical prostatectomy (NSRP), which is to preserve sexual function. We categorized patients' clinical circumstances by increasing complexity and counted the mismatches in each, expecting weaker or multiple contraindications to increase mismatched treatments. **RESULTS.** Of 438 eligible patients, 389 (89%) reported preexisting dysfunction, and more than one-third received mismatched treatments. Mismatches did not significantly increase with clinical complexity, and watchful waiting was very infrequent, even when all treatment options were contraindicated. Patient age and comorbidity, but not preexisting dysfunction, were associated with treatment choice. As expected, mismatched BT and EBRT led to worsened urinary and bowel symptoms, respectively, and NSRP did not improve outcomes after baseline sexual dysfunction. **CONCLUSIONS.** Pretreatment dysfunction does not appear to reliably influence treatment choices, and patients receiving mismatched treatments had worse outcomes. Further study is needed to determine why mismatched treatments were chosen, including the role of incomplete patient-physician communication of baseline dysfunction, and whether using a validated questionnaire before treatment decision-making would bypass this difficulty. Treatment mismatch may be a useful outcome indicator of the quality of patient-centered decisions.

WHAT YOU NEED TO KNOW:

In men with prostate cancer who have urinary, bowel, and sexual problems at diagnosis, certain treatments may not be beneficial and/or may have bad side effects. This study looked at how many patients were receiving these 'mismatched' treatments. For example, patients with obstructive uropathy (a blockage in the flow of urine) or bowel problems should not be treated with brachytherapy or external beam radiation because they can worsen these conditions. Men who already have sexual dysfunction may not be good candidates for nerve-sparing radical prostatectomy, which is meant to preserve sexual function.

In this study 438 patients reported their urinary, bowel, and sexual problems. Researchers examined the complexity of each patient's case and counted the treatment mismatches for each patient.

89% of the men reported some type of dysfunction and more than one-third received mismatched treatments. Preexisting dysfunctions were often not taken into account when looking at treatment options. Mismatched patients who received brachytherapy or external beam radiation had worsened urinary and bowel problems; mismatched patients who were treated with nerve-sparing radical prostatectomy did not improve sexual function. Even when all treatment options were a mismatch, watchful waiting was a very rare option.

THE BOTTOM LINE:

Patients who receive mismatched treatments have worse outcomes. Better physician-patient communication is advised, perhaps by using a thorough questionnaire before decision-making.

Original Abstract:

BACKGROUND: Active surveillance followed by selective treatment for men who have evidence of disease progression may be an option for select patients with early-stage prostate cancer. In this article, the authors report their experience in a contemporary cohort of men with prostate cancer who were managed with active surveillance. **METHODS:** All men who were managed initially with active surveillance were identified through the authors' institutional database. Selection criteria for active surveillance included: prostate-specific antigen (PSA) >0.75 ng/mL per year), was a secondary outcome. Chi-square and log-rank tests were used to compare groups. The association between clinical characteristics and receipt of active treatment was analyzed by using Cox proportional hazards regression. **RESULTS:** Three hundred twenty-one men (mean age $[\pm\text{standard deviation}]$: 63.4 \pm 8.5 years) selected active surveillance as their initial management. The overall median follow-up was 3.6 years (range, 1-17 years). The initial mean PSA level was 6.5 \pm 3.9 ng/mL. One hundred twenty men (37%) met at least 1 criterion for progression. Overall, 38% of men had higher grade on repeat biopsy, and 26% of men had a PSA velocity >0.75 ng/mL per year. Seventy-eight men (24%) received secondary treatment at a median 3 years (range, 1-17 years) after diagnosis. Approximately 13% of patients with no disease progression elected to obtain treatment. PSA density at diagnosis and rise in Gleason score on repeat biopsy were associated significantly with receipt of secondary treatment. The disease-specific survival rate was 100%. **CONCLUSIONS:** Selected individuals with early-stage prostate cancer may be candidates for active surveillance. Specific criteria can be and need to be developed to select the most appropriate individuals for this form of management and to monitor disease progression. A small attrition rate can be expected because of men who are unable or unwilling to tolerate surveillance. Copyright (c) 2008 American Cancer Society.

WHAT YOU NEED TO KNOW:

Active surveillance may be an option for some men with early-stage prostate cancer. Active surveillance involves closely monitoring the prostate cancer and selectively treating only those whose disease continues to progress.

Participants in this study were 321 men (average age 63 years) who chose active surveillance after being diagnosed with prostate cancer. The average PSA level at the beginning of the study was 6.5 (slightly elevated). The men were followed for an average of 3.6 years.

At the end of the study the results showed:

- ❖ 128 men (37%) showed evidence of disease progression.
- ❖ 38% had a higher grade of prostate cancer on a repeated biopsy.
- ❖ 26% had a rise in PSA greater than 0.75ng/mL, which may signal a more aggressive disease.
- ❖ 78 men (24%) received some form of treatment at an average of 3 years after diagnosis.
- ❖ 13% of patients with no disease progression chose to obtain treatment.
- ❖ Higher PSA at diagnosis and a rise in the grade of prostate cancer after a repeated biopsy were significantly associated with receiving treatment.

THE BOTTOM LINE:

Active surveillance may be a good option for some men with early-stage prostate cancer.