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Colon Cancer Prevention

DIET

1) Eat appropriate amounts and types of foods

Eat moderate portions of lower fat, low-glycemic foods in order to maintain a healthy weight. Obesity is associated with an increased risk of certain cancers, including colon cancer, as well as an increased likelihood of cancer recurrence.

2) What not to eat or drink

a) Overall, people who eat the typical Western diet featuring red meat, fried foods, refined grains (white flour, rice, pasta, etc.), and desserts, sodas, and other sweets (the "meat-sweet" diet) have a 50% greater chance of developing colon cancer than those who consume few of these foods.

b) High animal fat diet. There is a direct relationship suggested by epidemiological studies between total fat intake in the diet and increased risk of cancer in the colon and rectum. Animal fat, particularly dairy products, and red meat are associated with colon cancer risk, whereas there is no association with vegetable fats, and fish oils appear to have a protective effect (Schloss et al. 1997).

c) Eat less red meat. Eating over 6 ounces of red and processed meats such as ham, bacon, bologna, salami, corned beef, and sausage daily is associated with a 35% higher chance of developing colorectal cancer than just eating very little of these meats (an average of 1/3 ounce daily or 1 ounce serving less than once week).

d) Avoid highly browned meats (grilling, broiling, etc.), which lead to the formation of cancer promoting chemicals.[1]

e) Alcohol. According to one source:
"The risk factor associated with alcohol consumption and cigarette smoking is startling. Daily alcohol intake has been associated with a twofold increase in colon carcinoma (Giovannuci et al. 1998). Smoking is an independent risk factor and long-term smoking is particularly damaging, increasing the relative risk by 1.6-4.5 fold for adenoma formation (Nagata et al. 1999) Smoking more than 20 cigarettes a day increases the likelihood of having polyps by more then 250%, while alcohol consumption increases likelihood by 87%. When combined, smoking and alcohol consumption increase the likelihood by an astonishing 400% (Martinez et al. 1995; Lieberman et al. 2003).

3) What to eat

a) Substitute red meat with cold-water fish. Eating at least 3 ounces fish daily is associated with a 30% risk of developing colon cancer.
   i) Do avoid large fish such as tuna and swordfish that are high in mercury, as well as farmed salmon, which are high in PCBs.
   ii) For salmon, choose wild salmon from the northwest coast (Alaska) either fresh, frozen, or canned.

b) Soyfoods, such as tofu, tempeh and soymilk.
   i) Women who ate the most soyfoods were more than 30% less likely to develop colon or rectal cancer than women who ate the least soy. (Shanghai Women's Health Study).[2]

c) Use whole grains instead of refined grains. Whole grains have more folic acid and vitamin B6 than refined grains. People who have higher intakes of these vitamins have a lower risk of colon cancer. Whole grains contain many micronutrients that are beneficial for health, as well as fiber.

d) **10 portions bright-colored fruits and vegetables each day.** We are adapted to these over millennia of evolution.[3-4] Jeff Bland, Ph.D., a nutritional biochemist, considers cancer to be, in part, a phytonutrient deficiency disease.

   i) **Five to seven servings per week of cruciferous vegetables**, such as broccoli and broccoli sprouts, collards, Brussels sprouts, kale, cabbage, broccoli rabe/rapini, cauliflower, mustard and turnip greens, bok choy, and watercress.

      (1) Epidemiologic studies suggest that cruciferous vegetable intake may lower overall cancer risk, including colon cancer.[5]

   ii) Juicing vegetables can be an excellent way to get some servings of vegetables. Carrots, celery, beets, cucumbers, kale, chard, spinach, broccoli, sprouts, etc. can all be juiced in order to obtain high amounts of phytonutrients. Be careful of making your juices too sweet, as even natural sugars can increase insulin levels, which are proinflammatory. Use celery, cucumber, and green vegetable juices to cut down on the sweetness of carrot juice and limit fruit juices to small amounts for flavor.

   iii) Soups are also an excellent way to get vegetables. In the summer try chilled soups such as gazpacho; in the winter go for soups rich in different vegetables, legumes, and whole grains, such as mushroom-barley-spinach, potato-kale, and minestone-chard.

   iv) Berries. Many berries contain anti-cancer phytonutrients in addition to their antioxidant effects. These include black and red raspberries, strawberries, lingonberries, black and white currants, gooseberries, velvet leaf blueberry, low-bush blueberry, sea buckthorn (sea buckthorn is in Beyond Essential Fats by Natura) and cranberries.

   v) Fruits and vegetables high in folic acid, such as dark green leafy vegetables (the "fol" in folate stands for "foliage"). Spinach, chard, broccoli, kale, collards are some examples. Oranges, cantaloupe, and whole grains are also sources of folic acid.

   vi) Foods high in "calcium-d-glucurate" such as oranges, apples, grapefruit, cruciferous vegetables (see above), yogurt, onions, and garlic.

      (1) Calcium-d-glucurate helps to inhibit an enzyme in the gut called beta-glucuronidase. Elevated beta-D-glucuronidase activity in the gut is associated with an increased risk for various cancers, particularly hormone-dependent cancers such as breast, prostate, and colon cancers [6]. The activity of beta-glucuronidase is enhanced by a high animal fat diet. (Another reason to avoid meat; well done meat is even more harmful). Fiber, lactobacillus, oranges, onions, garlic, and greens decrease beta D- glucuronidase.

   vii) High calcium foods from vegetable sources such as kale, collards, . Of all food sources of calcium, only milk consumption was similarly inversely associated with colorectal cancer risk.

e) Curries which include turmeric (the spice that turns the food yellow)

f) Flaxseed, ground. This may help prevent colon cancer development and also decreases gut inflammation.

g) Low or nonfat unsweetened yogurts with active cultures. Chose a yogurt with mixed cultures including bifidus as well as Lactobacillus varieties. This is preferable to plain milk.
   i) Dannon makes Activia low-fat yogurt in a plain 1 quart size that has bifidobacteria, which helps normalize colon transit and help with regularity.
   ii) Stoneyfield Farms plain nonfat yogurt has bifidus, as well as other healthy Lactobacillus varieties.
   iii) Unfortunately, the Fage Greek yogurt only has Lactobacillus bulgaris and S. thermophilus, so it is not as good a source for "probiotics" as other more complex and tangy yogurts.

LIFESTYLE

1) Exercise

Exercising at least 5 times per week is associated with a decrease in colon cancer risk for both men and women. [7]

SUPPLEMENTS

1) Calcium

a) When calcium from diet and supplements combined was examined, the risk of developing colorectal cancer in those whose intake was highest was 22 percent lower than that of the group consuming the least. The authors concluded that increasing calcium to 1000 milligrams per day or greater could result in 10 percent fewer cases of colorectal cancer among men, and 15 percent fewer cases in women.
b) Calcium supplementation was associated with a decrease in all types of polyps, however its protective effect was the greatest for advanced polyps. The protective effect of calcium appeared to be the strongest in individuals consuming a high fiber and low fat diet, but this finding was not determined to be statistically significant.
c) Oral calcium supplementation has been proposed as a dietary intervention for individuals at high risk of colorectal cancer because calcium can reduce the growth rate of rectal and colonic epithelial cells both directly and by binding bile acids and fatty acids in the stool, resulting in compounds that are less likely to adversely affect the colon (Rozen et al. 1989). Calcium reduces the risk of colorectal cancer but its effects may occur only in individuals who have a low level of fat intake (De et al. 1997) and may also be site-specific within the colon (Cats et al. 1995). However, oral calcium supplementation reduced benign epithelial tumor (adenoma) formation by 19% (Barron et al. 1999) and was shown to cause a minor nonstatistically significant reduction of epithelial cell proliferation in the rectum (Cats et al. 1995).
d) Calcium supplementation reduces colonic cell proliferation, in part, by decreasing the level of diacylglycerol (DAG). A high luminal level of DAG, a key factor in cell growth control, enhances colonic cell proliferation. Bacterial DAG production is increased by bile acids and phospholipids, both of which may be precipitated by calcium. Calcium was shown to alter fecal lipid composition and to reduce cell proliferation. Oral elemental calcium therapy, 2.4 or 3.6 g/day, for three months markedly reduced fecal DAG concentration and output without enhancing DAG production (Steinbach et al. 1994).
e) Try using a liquid calcium carbonate supplement such as Schiff

2) ***Vitamin D***
   a) Increased vitamin D intake has been associated with reduced risk for colon carcinoma (Garland et al. 1999). Vitamin D3 causes differentiation of colon cancer cells. Cancer cells that are well differentiated are close to the original normal healthy colon cells in nature and are usually less aggressive cancer cells. Poorly differentiated cells have changed more from the normal healthy cells and are usually more aggressive cancer cells.
   b) There is a strong correlation between vitamin D and calcium intake and the risk of colon cancer.
   c) Aim for blood levels of at least 50 ng/ml of 25-OH vitamin D. Monitor blood levels twice yearly.
   d) A supplement is almost always necessary. Usually 2,000 IU daily (from all sources) is needed to maintain adequate blood levels. Some people need more.

3) ***Folic acid***
   a) Folic acid supplementation is an important factor in preventing colon cancer IF there are no precancerous lesions. Unfortunately, high amounts of synthetic folic acid (1,000 mcg or 1 mg.) may promote colon cancer, if there are precancerous polyps Do eat natural sources of folic acid, which are associated with a decreased incidence of colon cancer—the natural folates are not a problem.
      i) If you can get a vitamin with "folinic acid" or "methyl-folate" which are natural forms of folic acid, do so. These are usually carried by vitamin companies that sell only to health professionals.
      ii) As a patient of Dr. Albert's, you can order a suitable multivitamin-mineral supplement directly from ProThera, or pick it up at our office.

4) A reduced risk of colon cancer is associated with the use of vitamin C (Howe et al. 1992). Vitamins C, E, and A showed protection against the risk of developing colorectal cancer (Newberne et al. 1990).

5) ***Selenium***
   a) Selenium supplementation associated with reduced colorectal cancer risk
   b) The April 2006 issue of the International Journal of Cancer published the findings of researchers from Roswell Park Cancer Institute in Buffalo, New York that supplementing with selenium significantly reduced the risk of colorectal adenomas (polyps) among smokers or those whose levels of the mineral were low. Polyps can be a precursor to colorectal cancer (CRC). When current smokers were separately analyzed, there was a significant 73 percent reduction in risk found among those supplemented with selenium compared to those who received the placebo. When the participants were divided into thirds according to baseline plasma selenium status, those whose levels were in the lowest third and who received selenium rather than a placebo, also experienced a 73 percent reduction in risk.

6) ***Calcium D Glucurate***
   a) Dietary sources: oranges, apples, grapefruit, cruciferous vegetables (broccoli, Brussels sprouts, cauliflower, etc.)

b) "Oral supplementation of calcium-D-glucarate has been shown to inhibit beta-glucuronidase, an enzyme produced by colonic microflora and involved in Phase II liver detoxification. Elevated beta-glucuronidase activity is associated with an increased risk for various cancers, particularly hormone-dependent cancers such as breast, prostate, and colon cancers."

7) Curcumin and Quercetin

a) Curcumin, along with quercetin, has been shown in a small study to decrease the number and size of colon polyps in patients including those with colostomies, after 6 months of supplementation.[8]

8) Sulforaphanes

a) "Previous preclinical and clinical studies from this laboratory have established an association between decreased GST activity and increased risk for colorectal cancer." Sulforaphanes upregulate GST activity.
b) Dietary sources (cruciferous vegetables) will not provide as much as will a supplement.

9) Dysbiosis

a) Having inadequate amounts of certain gut bacteria can lead to an increased potential for gut inflammation. In addition, gut flora can also be associated with elevated beta-glucuronidase activity, which is associated with various hormone dependent cancers, including colon cancer.
    i) Example: Although Klebsiella pneumonia is a typical bacteria found in the gut, in large amounts it may be able to make toxic byproducts from the alcohol that is normally produced by other bacteria in the gut. Therefore, it makes sense to crowd them out with positive bacteria.
b) Saccharomyces boulardii (Saccharomycin or Florastor) helps protect from pathogens.
c) A good multispectrum Lactobacillus and bifidus probiotic is also helpful in crowding out non-optimal gut flora and replacing it with gut flora that have a more anti-inflammatory effect. The type of probiotic recommended depends on the results of your Comprehensive Digestive Stool Analysis, or Stool Microbiology.
d) In particular, L. acidophilus, B. longum, S. thermophilus, and L. rhamnosus may be good to include. Prebiotics such as inulin and FOS can help the healthy GI bacteria to thrive and further crowd out inflammatory bacteria. This is particularly important for anyone whose diet is higher in fat.

References

1. Rohrmann S, Hermann S, Linseisen J. Heterocyclic aromatic amine intake increases colorectal adenoma risk: findings from a prospective European cohort study. *Am J Clin Nutr.* Mar 4 2009.

2. Yang G, Shu XO, Li H, et al. Prospective cohort study of soy food intake and colorectal cancer risk in women. *Am J Clin Nutr.* Feb 2009;89(2):577-583.

3. Steinmetz KA, Potter JD. Vegetables, fruit, and cancer. I. Epidemiology. *Cancer Causes Control.* Sep 1991;2(5):325-357.

4. Steinmetz KA, Potter JD. Vegetables, fruit, and cancer. II. Mechanisms. *Cancer Causes Control.* Nov 1991;2(6):427-442.

5. Clarke JD, Dashwood RH, Ho E. Multi-targeted prevention of cancer by sulforaphane. *Cancer Lett.* Oct 8 2008;269(2):291-304.

6. Colon cancer and the Western diet. *Integr Cancer Ther.* Dec 2002;1(4):420-421.

7. Peddle CJ, Au HJ, Courneya KS. Associations between exercise, quality of life, and fatigue in colorectal cancer survivors. *Dis Colon Rectum.* Aug 2008;51(8):1242-1248.

8. Cruz-Correa M, Shoskes DA, Sanchez P, et al. Combination treatment with curcumin and quercetin of adenomas in familial adenomatous polyposis. *Clin Gastroenterol Hepatol.* Aug 2006;4(8):1035-1038.