

# BCC REPORT

## THE NEWSLETTER OF BREAST CANCER CONNECTIONS

Your Community Resource for Information & Support

### Nutrition and Breast Cancer

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According to the National Cancer Institute, one woman in eight will develop breast cancer in her lifetime. Fortunately, more and more women are surviving. It is estimated that there are 10 million cancer survivors in the U.S. and that 89 percent of breast cancer survivors live longer than five years.

While it's clearly not possible to control all cancer risk factors, diet and lifestyle can be very empowering to a cancer survivor because they are, in fact, controllable and part of a healthy survivorship plan. It has been established that a healthy diet lowers the risk of various chronic diseases, including heart disease, diabetes, and obesity. Additionally, a healthy diet helps to increase energy levels, facilitate recovery, and enhance immune function. One-third of cancer deaths in the U.S. can be attributed to diet in adulthood, including diet's effect on obesity, physical inactivity, and poor nutrition (Byers).

The World Cancer Research Fund and the American Institute for Cancer Research published a report on the 10 Recommendations for Cancer Prevention

(WCRF/AICR), many of which are discussed in greater detail below.

- Be as lean as possible without becoming underweight.
- Be physically active for at least 30 minutes a day.
- Avoid sugary drinks. Limit consumption of energy-dense foods (particularly processed foods high in added sugar, or low in fiber, or high in salt).
- Eat more of a variety of vegetables, fruits, whole grains, and pulses such as beans.
- Limit consumption of red meats and avoid processed meats.
- If consumed at all, limit alcoholic drinks to two for men and one for women a day. (Read on for other alcohol and breast cancer-related studies.)
- Limit consumption of salty foods and food processed with salt.
- Don't use supplements for cancer prevention.
- It's best for mothers to breastfeed exclusively for up to six months and then add other liquids and foods.
- After treatment, cancer survivors should follow the recommendations for cancer prevention.

#### Body Weight and Physical Activity

Being overweight is approaching *epidemic* proportions in the U.S. In particular, fat around the waistline increases hormone levels and promotes inflammation, two factors that encourage cancer development. The Nurses Health Study reported that overweight nonsmokers were almost twice as likely to die of breast cancer than nonsmokers who were of normal weight (Kroneke). Breast cancer patients who gained more than 17 pounds after treatment were 1.5 times more likely to have a cancer recurrence.

Physical activity after a breast cancer diagnosis may reduce the risk of death from breast cancer (Holick). The greatest benefit occurred in women who performed the equivalent of walking

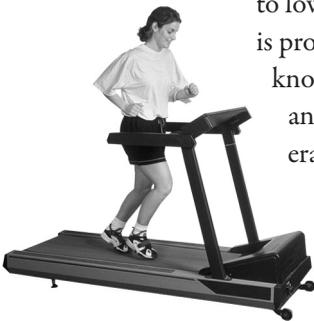
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three to five hours per week at an average pace (Holmes). In another study, 30 minutes or more of walking six days a week in addition to eating five or more vegetables and fruits daily decreased the risk of death after early-stage breast cancer by ~50 percent (Pierce).

In cancer survivors, exercise has been shown to:

- Improve cardiovascular fitness, muscle strength, and body composition.
- Decrease fatigue, anxiety, depression.
- Improve self-esteem and quality of life.
- Aid in weight management.

While there are various therapeutic benefits of physical activity, research indicates that exercise training alters insulin-like growth factor-I (IGF-I) to lower the risk of cancer. IGF-I is a hormone that is produced in the liver and body tissues that is known to stimulate the growth of both normal and cancerous cells and has been shown to accelerate the growth of breast cancer cells.



Some studies indicate that high insulin levels, elevated concentrations of IGF-I, and greater abdominal fat are associated with increased risk for breast cancer. Additionally, hyperinsulinemia (high levels of insulin in the blood) is associated with increased risk of heart disease, type 2 diabetes, and weight gain (obesity). Furthermore, obesity and fasting hyperinsulinemia have been associated with a poorer prognosis in women with established breast cancer. Moderate-intensity aerobic exercise, such as brisk walking, decreases IGF-I. The exercise-induced decreases in IGF-I may mediate the observed association between higher levels of physical activity and improved survival in women diagnosed with breast cancer (Irwin).

### Sugars and Refined Carbohydrates

High-sugar foods and refined carbohydrates are generally low in nutrient value and low in dietary fiber. Evidence suggests that refined cereals (primarily breads and pasta) and desserts have been associated with cancer. Additionally, these foods appear to increase serum insulin and serum IGF-I

levels, which lead to the development and promotion of cancer. Studies have observed that in fact a diet high in refined carbohydrates can lead to high blood levels of insulin and increased tumor growth [Muti]. Additionally, women who consumed the greatest intake of desserts (including biscuits, brioches, cakes, puffs, and ice cream) and sugars (including sugar, honey, jam, marmalade, and chocolate) had a 19 percent increased risk of breast cancer compared with women who consumed the least desserts and sugars (Tavani). Refined carbohydrates to be consumed in limited amounts include products made with refined flours (for example: white bread, white rice, white pasta) or refined grains, alcohol, and sweets, such as candy, cookies, cakes, and pastries.

### Dietary Fats

While the jury is still out regarding the exact association of fat and breast cancer, the Women's Intervention Nutrition Study (WINS) reported a low-fat diet to lower the risk of recurrence (Chlebowski). Women who followed a low-fat diet (~20 percent total calories, 35 gm total fat) experienced a 24 percent reduction in breast cancer recurrence compared to women following a standard diet. Women with estrogen-receptor-negative (ER-) breast cancer had a 42 percent reduced risk of recurrence. Additionally, a low-fat diet regimen improves insulin sensitivity.

While the detrimental effects of saturated and trans fatty acids have been identified, research regarding the balance of the essential fatty acids, omega-6 fatty acids, and omega-3 fatty acids is steadily growing. Current research suggests that the levels of the essential fatty acids and the balance between them may play a critical role in the prevention and treatment of cancer and other chronic illnesses. Omega-3 fatty acids (alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA)) may reduce the risk of cancer and its progression. These fats are also known to strengthen the immune system and have anti-inflammatory effects.



- Limit fatty meats, whole milk dairy products, butter, and baked goods due to high saturated fat and total fat content to help increase nutrient-rich, low-energy-density foods, to promote weight control without dieting, and to improve cardiovascular health.
- Avoid hydrogenated oils; read the ingredients, and if you see partially hydrogenated or hydrogenated oils, put it back!
- Include small amounts of healthy fats: use monounsaturated oils such as olive, almond, avocado, or canola oil for cooking/salads.
- Limit common vegetable oils, such as corn oil, safflower oil, sunflower oil, and cottonseed oil, and processed foods made with these omega-6 oils.
- Increase sources of omega-3 daily: cold water fish (such as salmon, sardines, black cod, trout, herring), flax seeds, chia seeds, walnuts, hempseeds, and pumpkin seeds.

### Plant-Based Diet

Eat more of a variety of vegetables, fruits, whole grains, and legumes such as beans. Such a diet helps achieve two goals: increased vitamins, minerals, dietary fiber, and cancer-fighting phytonutrients, and reduced consumption of animal fats and animal protein, processed foods, and sugars.

- Consume at least five, preferably **eight to ten**, servings of colorful fruits and vegetables daily, such as arugula, bok choy, broccoli, brussels sprouts, cabbage, cauliflower, collard greens, kale, kohlrabi, mustard greens, radishes, rutabaga, turnip greens, and watercress.
- Eat vegetables rich in beta-carotene daily, such as carrots, sweet potatoes, winter squash, cantaloupe, and mango.
- Include berries or pomegranate daily.
- Aim for 30 to 45 grams of fiber daily. Choose breads with three or more grams of fiber per slice. First ingredient on bread labels should be whole or sprouted grain flour, not white flour, unbleached white flour, or enriched wheat flour. Whole grains include, among others, oats, barley, brown rice, quinoa, amaranth, bulgur, millet, buckwheat, spelt, wild rice, and teff.

A prudent diet characterized by high intakes of fruits, vegetables, whole grains, and poultry was associated with a statistically significant decreasing risk of overall death compared with women eating a Western diet with high intakes of red and processed meats and refined grains [Kwan]. A diet rich in natural fiber obtained from fruits, vegetables, legumes, and whole grains may reduce breast cancer risk and reduce risk of breast cancer progression after an initial diagnosis of breast cancer. Fiber binds to toxic compounds and carcinogens, which are later eliminated by the body. Additionally, a low-fat diet, rich in insoluble fiber, has been shown to decrease the circulating levels of estrogen, thereby potentially reducing the risk of hormone-related cancers. Additionally, high-fiber foods are low in energy density and very satiating. Thus, fiber is important for weight management. Aim for deriving at least 80 percent of your diet from healthful plant sources.



### Alcohol

Regular consumption of alcohol appears to increase the risk of breast cancer. One likely mechanism is that alcohol increases endogenous estrogen levels. A study presented at the American Society for Clinical Oncologists (ASCO) 2005 Annual Meeting found that as little as a half a glass of wine a day raised a woman's risk of developing breast cancer by six percent (increased risk by 18 percent in postmenopausal women) (Chen). Furthermore, consuming one to two drinks a day increased their risk by 21 percent, and two or more drinks a day increased a woman's risk by 37 percent. The heightened risk was more pronounced for women with estrogen-receptor-positive (ER+) and progesterone-receptor-positive (PR+) tumor types. More recently, at the San Antonio Breast Cancer Symposium in December 2009, it was reported that women who drank three or more glasses of alcohol a week increased their risk of recurrence by 34 percent and their risk of dying from breast cancer by 51 percent (Kwan).

### Soy

Whole soy foods are known to be nutrient-rich, comprised of isoflavones, protein, fiber, poly-unsaturated fatty acids, B vitamins, minerals (calcium, iron, & zinc), saponins, and phytosterols (beta-sitosterol). While more research is needed, the majority of

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### Summary

- **Eat eight to ten colorful fruit and vegetable servings daily**
  - Two to three pieces of fruit
  - One cup or more of vegetables with lunch and dinner
  - Use herbs and spices liberally – turmeric, ginger, garlic, etc.
- **Consume 30 to 45 grams of fiber daily**
  - Fruits and vegetables, beans/legumes, whole grains
- **Avoid processed and refined grains/flours/sugars**
  - Keep WHITE off your plate: bread, pasta, rice, cream sauces, cakes, and more
- **Limit meats and dairy products**
- **Moderate consumption of WHOLE or lesser processed soy foods**
  - Soybeans, tempeh, miso, tofu, edamame, soymilk

- **Include small amounts of healthy fats**
  - Cold-water fish, chia seeds, flaxseed, walnuts, soybeans, olive oil, avocados
- **Eat two tablespoons of ground flax daily**
- **Drink plenty of fluids, water, or non-caffeinated beverages, daily to help meet fluid needs**
  - Limit alcohol consumption to two or fewer drinks per week
  - Drink one to four cups of green tea daily
- **Engage in daily physical activity to help achieve and maintain a healthy weight**
- **Maintain serum 25 (OH)-vitamin D levels above 40 ng/mL**
  - Sunlight, fortified foods, supplements

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studies indicate that eating soy foods in adulthood is not only safe, but possibly beneficial against breast cancer. A review of the existing literature suggests that consumption of soy foods or exposure to soy isoflavones during childhood and adolescence in women reduces later mammary cancer risk (Warri). The LACE study observed that soy may reduce the risk of recurrence in women who have been treated with tamoxifen, particularly for postmenopausal women (Guha).

At the very least, current research indicates that breast cancer survivors can safely eat soy foods in amounts comparable to Asian populations (one to three servings daily). At the same time, there is not ample research to insist that you add soy to your diet. Emphasize whole soy foods or lesser processed soy foods (i.e., edamame, tofu, tempeh, miso, soy nuts) over second generation soy foods, products containing soy isoflavone extracts, and soy supplements.

### Vitamin D

Vitamin D is a fat-soluble vitamin found primarily in fatty fish and in some fortified products, such as milk, soy milk, cereals, and orange juice. Generally, our dietary intake is not adequate to meet the normal daily requirements. More often, we generate vitamin D through skin synthesis of sunlight (ultraviolet rays).

The benefits of vitamin D are many, including observed protective effects against cancer, bone disease, heart disease,

infections, inflammatory conditions, and multiple sclerosis. Vitamin D levels have been linked to increased cancer survival. Women with deficient levels of vitamin D were nearly twice as likely to have their cancer recur or spread over the next 10 years, and 73 percent more likely to die of the disease (Goodwin). The Healthy Eating, Activity, and Lifestyle (HEAL) Study reported that 75.6 percent of the breast cancer survivors had insufficient levels of vitamin D (Neuhouser).



It is now believed that the recommended dose should be between 800 and 2,000 IU per day. Due to the likelihood of a biochemical deficiency without clinical symptoms or signs, a serum 25-hydroxy-vitamin D level is recommended. Leading vitamin D experts suggest optimal levels are somewhere between 40-60 ng/mL (Crew). [⌘](#)

**References:** Available on next page.

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## Nutrition and Breast Cancer References:

- Byers, T, Nestle, M, McTiernan, A, Doyle, C, Currie-Williams, A, Gansler, T, et al. American Cancer Society 2001 Nutrition and Physical Activity Guidelines Advisory Committee. (2002). American Cancer Society guidelines on nutrition and physical activity for cancer prevention: Reducing the risk of cancer with healthy food choices and physical activity. *CA: A Cancer Journal for Clinicians*, 52(2), 92-119.
- World Cancer Research Fund/American Institute for Cancer Research. Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective. Washington DC: AICR, 2007
- Kroenke CH, Chen WY, Rosner B, Holmes MD. Weight, weight gain, and survival after breast cancer diagnosis. *J Clin Oncol*. 2005 Mar 1;23(7):1370-8. Epub 2005 Jan 31.
- Holmes MD, Chen WY, Feskanich D, Kroenke CH, Colditz GA. Physical activity and survival after breast cancer diagnosis. *JAMA*. 2005 May 25;293(20):2479-86.
- Holick CN, Newcomb PA, Trentham-Dietz A, Titus-Ernstoff L, Bersch AJ, Stampfer MJ, et al. Physical activity and survival after diagnosis of invasive breast cancer. *Cancer Epidemiol Biomarkers Prev*. 2008 Feb;17(2):379-86. Epub 2008 Feb 4.
- Irwin ML, Varma K, Alvarez-Reeves M, Cadmus L, Wiley A, Chung GG, et al. Randomized controlled trial of aerobic exercise on insulin and insulin-like growth factors in breast cancer survivors: the Yale Exercise and Survivorship study. *Cancer Epidemiol Biomarkers Prev*. 2009 Jan;18(1): 306-13.
- Pierce JP, Stefanick ML, Flatt SW, Natarajan L, Sternfeld B, Madlensky L, et al. Greater survival after breast cancer in physically active women with high vegetable-fruit intake regardless of obesity. *J Clin Oncol*. 2007 Jun 10;25(17):2345-51.
- Chlebowski RT, Blackburn GL, Thomson CA, Nixon DW, Shapiro A, Hoy MK, Goodman MT, et al. Dietary fat reduction and breast cancer outcome: interim efficacy results from the Women's Intervention Nutrition Study. *J Natl Cancer Inst*. 2006 Dec 20;98(24):1767-76.
- Muti P, Quattrin T, Grant BJ, Krogh V, Micheli A, Schunemann HJ, et al. Fasting glucose is a risk factor for breast cancer: a prospective study. *Cancer Epidemiol Biomarkers Prev*. 2002;11(11):1361-1368.
- Tavani A, Giordano L, Gallus S, Talamini R, Franceschi S, Giacosa A, et al. Consumption of sweet foods and breast cancer risk in Italy. *Ann Oncol*. 2006;17(2):341-345.
- Kwan ML, Weltzien E, Kushi LH, Castillo A, Slattery ML, Caan BJ. Dietary patterns and breast cancer recurrence and survival among women with early-stage breast cancer. *J Clin Oncol*. 2009 Feb 20;27(6):919-26. Epub 2008 Dec 29.
- <http://www.webmd.com/breast-cancer/news/20091210/alcohol-raises-risk-of-breast-cancer-recurrence>
- Chen WY, Willett WC, Rosner B, Colditz GA. Moderate alcohol consumption and breast cancer risk. *J Clin Oncol*, 2005 ASCO Annual Meeting Proceedings. Vol 23, No 16S (June 1 Supplement), 2005: 515
- Guha N, Kwan ML, Quesenberry CP Jr, Weltzien EK, Castillo AL, Caan BJ. Soy isoflavones and risk of cancer recurrence in a cohort of breast cancer survivors: the Life After Cancer Epidemiology study. *Breast Cancer Res Treat*. 2009 Nov;118(2):395-405. Epub 2009 Feb 17.
- Warri A, Saarinen NM, Makela S, Hilakivi-Clarke L. The role of early life genistein exposures in modifying breast cancer risk. *Br J Cancer*. 2008;98(9):1485-1493
- Goodwin PJ, Ennis M, Pritchard KI, Koo J, Hood N. Prognostic effects of 25-hydroxyvitamin D levels in early breast cancer. *J Clin Oncol*. 2009 Aug 10;27(23):3757-63. Epub 2009 May 18.
- Neuhouser ML, Sorensen B, Hollis BW, Amba A, Ulrich CM, McTiernan A, Bernstein L, Wayne S, Gilliland F, Baumgartner K, Baumgartner R, Ballard-Barbash R. Vitamin D insufficiency in a multiethnic cohort of breast cancer survivors. *Am J Clin Nutr*. 2008 Jul;88(1):133-9.
- Crew KD, Gammon MD, Steck SE, Hershman DL, Cremers S, Dworakowski E, et al. Association between plasma 25-hydroxyvitamin D and breast cancer risk. *Cancer Prev Res (Phila Pa)*. 2009 Jun;2(6):598-604. Epub 2009 May 26.