Studies on How Lifestyle Factors May Affect Breast Cancer Risk and Recurrence

By Nancy J. Nelson

Although obesity and inactivity are associated with higher rates of postmenopausal breast cancer and poorer prognosis among breast cancer patients, increasing evidence suggests that weight loss—along with increased physical activity—reduces risk of breast cancer or its recurrence.

According to Rachel Ballard-Barbash, M.D., M.P.H., an epidemiologist at the Division of Cancer Control and Population Sciences at the National Cancer Institute, “Even though we do not yet have randomized controlled trial evidence of whether weight control and regular physical activity will lower cancer risk or extend life for breast cancer survivors, extensive data suggest that maintaining a healthy weight and exercising regularly will improve quality of life among the general population as well as breast cancer survivors.”

With more and more breast cancer survivors, good lifestyle habits should continue well after treatments, Ballard-Barbash continued. “Cancer survivors are at greater risk for other chronic diseases, such as diabetes, hypertension, and coronary heart disease. So, these health habits are also essential to manage other chronic conditions that may develop.”

Weight Loss and Exercise

Although hundreds of observational studies consistently link excess weight and inactivity to higher rates of postmenopausal breast cancer and poorer prognosis in survivors, only a few studies examine whether weight loss affects cancer endpoints. According to Tim Byers, M.D., M.P.H., of the Colorado School of Public Health in Aurora, in a recent review article, that’s because intentionally losing weight and keeping it off is relatively uncommon. However, a few large studies on bariatric procedures, which involve surgically reducing the size of the stomach, suggest that...
weight loss is associated with lower cancer risk. After nearly 11 years of follow-up, a Swedish study found that women undergoing the surgery had a 42% lower overall cancer risk and a 31.9% lower weight than those of control subjects (Lancet Oncol. 2009;10:653–62). A study in Utah reported that 2 years after surgery, women had a 24% lower total cancer incidence after a 31% reduction in weight compared with control subjects (Obesity 2009;17:796–802).

Other large cohort studies show similarly encouraging results for weight loss. Losing at least 20 pounds was associated with a 19% lower postmenopausal breast cancer incidence in Iowa women (Int. J. Obes. Relat. Metab. Disord. 2003;27: 1447–52), whereas losing at least 22 pounds was associated with a 57% lower risk of postmenopausal breast cancer among women in the Nurses’ Health Study (JAMA 2006;296:193–201). No known studies of cancer survivors link weight loss with decreased recurrence.

Studies also link exercise to positive endpoints. Many observational studies, including those cited in a recent review by Brooke M. Winzer, Ph.D., of the school of medicine at the University of Queensland in Brisbane, Australia, show that women who exercise more have a 20%–30% lower risk of breast cancer than that of sedentary women (Cancer Causes Control 2011;22: 811–26).

Winzer also cited data from breast cancer survivors in three different cohorts, which suggest that exercise is associated with longer survival: Compared with inactivity, 2–3 hours of brisk walking per week reduced breast cancer recurrence and all-cause mortality by 40%–67%.

Melinda L. Irwin, Ph.D., M.P.H., of Yale School of Public Health, and colleagues, analyzing data from the Women’s Health Initiative, found that high levels of physical activity improved survival in postmenopausal women with breast cancer, even among those reporting low physical activity before diagnosis (Cancer Prev. Res. 2011;4:522–9).

**Intervention Trials on Survivors**

Although no U.S. randomized controlled trial (RCT) has tested whether weight loss or exercise can prevent cancer-related death or recurrence, several small weight loss and physical activity intervention trials among cancer survivors have tested other endpoints. A 2010 meta-analysis of 82 studies on physical activity interventions in cancer survivors by Rebecca M. Speck, M.P.H., an epidemiologist at the division of clinical epidemiology at the University of Pennsylvania in Philadelphia, showed that patients tolerated physical activity well during and after cancer treatment. Upper and lower body strength, fatigue level, physical activity level, aerobic fitness, muscle strength, anxiety symptoms, and self-esteem all improved. Most of the studies (83%) involved breast cancer patients, 90% were RCTs, and interventions were typically moderate to vigorous intensity, three to five times per week for 30–45 minutes per session.

Another 2011 review of 21 RCTs involving diet and exercise interventions in cancer survivors published between 2007 and 2010 concluded that physical activity interventions were safe, improving fitness and strength while reducing fatigue and emotional distress. Researchers reported various degrees of success in testing weight-loss strategies, which involved combinations of calorie restriction; increased fruit, vegetable, and whole grain consumption; restrictions on fat and sugar; and increased exercise. Intervention protocols used group classes, telephone counseling, and print material to try to change eating and exercise habits. Studies have also linked exercise to small to moderate improvements in the concentrations of several blood biomarkers, such as insulin, leptin, estrogen, and apoptosis markers, that may be involved in cancer pathways.

“Solid progress is being charted in trials that have used diverse interventions to promote weight loss or weight management among a wide variety of cancer survivors,” said Wendy Demark-Wahnefried, Ph.D., a professor in the University of Alabama at Birmingham Department of Nutrition Sciences and one of the authors of the 2011 review. This work, she concluded, will eventually lay the foundation for trials that explore weight loss and physical activity in relation to cancer-specific endpoints.

One of those trials already began in Europe in 2009—the German SUCCESS C Study, involving about 3,500 overweight or obese women with early-stage breast cancer. After the first randomization to test anthracycline-free chemotherapy, the researchers will evaluate whether weight loss plus physical activity improve survival. The 2-year protocol is designed to promote a 5%–10% weight loss in the first 6 months, followed by 18 months of weight maintenance. The protocol includes calorie restriction (1,200–1,800 kcal/day), of which no more than 20%–25% should be fat; increased consumption of whole-grain products, fruits, and vegetables; and progressive physical activity. A coaching team of trained nurses, dietitians, physicians, and psychologists will support the women.

**In the Clinic**

Meanwhile, physicians are encouraging women to maintain a healthy weight and to exercise regularly. Patricia Ganz, M.D., professor at the UCLA schools of medicine and public health, says that her first recommendation for breast cancer survivors is to not gain any weight. “The most conclusive data about breast cancer recurrence are related to weight gain after diagnosis,” she said. Not only are many women with postmenopausal breast cancer already overweight or obese, she said, but in the year after diagnosis, many gain a substantial amount of weight.

“So I ask patients to get on a scale and weigh themselves daily and, if they go up a few pounds, to lose it immediately. Because most of us are on a weight-gain trajectory as we age, we will be 10–20 pounds lighter than expected over the next 10 years if we stay the same,” Ganz said.
Jo Anne Zujewski, M.D., of the Clinical Investigation Branch of the Cancer Therapy Evaluation Program at the National Cancer Institute, also counsels patients who are undergoing chemotherapy not to gain weight. “After chemo, I recommend that they address diet and exercise, with the goal of maintaining a normal body mass index and walking briskly or an equivalent for 30 minutes five or more times a week. I tell them to start slowly with attainable goals.” For example, if they don’t exercise at all, she might recommend starting with 10 minutes a day by walking around the block after dinner.

Wendy Y. Chen, M.D., M.P.H., an assistant professor of medicine at Harvard Medical School in Boston, says the first thing she finds out is what exercise the patient is doing, to help her set manageable goals. “You don’t have to go to a gym or be out of breath and sweaty,” she said. “Even moderately paced walking is a good form of exercise.” After treatment, she counsels patients on the more challenging goal—maintaining a healthy weight—by promoting foods low in saturated fats and limiting consumption of red meat and alcohol.

**General Guidelines**

Leading organizations that issue health recommendations for cancer prevention advocate maintaining a healthy weight and exercising regularly. A healthy weight is considered to be a body mass index between 18.5 and 25 kg/m² of body surface area, and regular exercise is defined as at least 150–210 minutes of moderate exercise weekly.

The American Cancer Society recommends 30 minutes of moderate to vigorous physical activity five or more days per week (45–60 minutes is preferable). See recommendations at http://tinyurl.com/7thsow3.

The World Cancer Research Fund/American Institute for Cancer Research recommends at least 30 minutes of daily moderate physical activity equivalent to brisk walking. See recommendations at http://tinyurl.com/7boz547.

For more on maintaining a healthy weight, visit the Centers for Disease Control and Prevention: http://www.cdc.gov/healthyweight/assessing/bmi/.

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