

NAMS PRACTICE PEARL

Lifestyle and Breast Cancer Risk Reduction

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Primary prevention is the most cost-effective long-term strategy for reducing breast cancer occurrence. Lifestyle education centered on the 2018 American Institute for Cancer Research Cancer Prevention Recommendations, offered as a package, should be a core component of routine patient visits. The key components of the recommendations include maintenance of a normal weight; following a low-fat, whole-food, plant-predominant diet rich in whole grains, fruit, and vegetables; regular physical activity; and alcohol avoidance.

Breast cancer is the most common cancer in women, excluding skin cancer, both in the United States and worldwide. In 2021, there were an estimated 281,500 new diagnoses of invasive breast cancer and an additional 49,290 cases of in situ breast lesions in US women. Expert reports estimate that at least 30% of breast cancer cases could be prevented by lifestyle modification, and if such changes were implemented early in life, this number may be as high as 50% to 70%.

The World Cancer Research Fund (WCRF)/American Institute for Cancer Research (AICR) is the world's largest source of scientific evidence on the effect of lifestyle factors on the risk of developing cancer. In 2018, the WCRF/AICR published *Diet, Nutrition, Physical Activity and Cancer: A Global Perspective*, the Third Expert Report, and updated the AICR Cancer Prevention Recommendations, which highlight the importance of lifestyle modification for cancer prevention.¹

Obesity and breast cancer. The National Center for Health Statistics at the Centers for Disease Control and Prevention (CDC) estimates that about 42% of US women aged 20 years and older were obese as of 2017-2018. For postmenopausal women with obesity, there is a 20% to 40% increased risk of breast cancer, particularly estrogen receptor (ER)-positive breast cancer, especially in nonusers of hormone therapy. In contrast, obesity is associated with a lower risk of ER-positive breast cancer and a higher risk of the more aggressive triple-negative breast cancer in premenopausal women.²

Obesity is associated with worse breast cancer outcomes for women of all ages, including shorter time to recurrence and increased mortality. Adiposity, particularly in the central or visceral distribution, increases the risk of development and progression of breast cancer as a result of hyperinsulinemia, increased estrogen, and inflammation.¹ These metabolic and endocrine

abnormalities result in disrupted cellular mechanisms leading to sustained proliferation, induced angiogenesis, reduced apoptosis, genomic instability, downregulated immunity, and dysregulated cellular energetics, which drive breast tumorigenesis and metastasis.^{2,3}

Although body mass index (BMI) criteria are used to define obesity, BMI does not differentiate between lean and fat tissue, and more important, it does not provide any information on the fat-distribution pattern. Postmenopausal women with a normal BMI can have central or visceral adiposity because of preferential fat distribution in those areas, which results from lack of estrogen.⁴ Therefore, techniques that measure body composition and fat distribution, such as dual energy X-ray absorptiometry, are superior to BMI for assessment of visceral adiposity, but their use is limited because of cost, feasibility, and concerns over low-dose radiation exposure.

Dietary modification and breast cancer. There is convincing evidence that the Mediterranean dietary pattern effectively decreases the risk of weight gain and obesity. Although methodologic challenges in dietary research exist, there are hundreds of observational studies suggesting that poor dietary habits increase the risk of breast cancer and the resultant mortality. The Women's Health Initiative Dietary Modification randomized, controlled trial of almost 49,000 postmenopausal women showed a 21% reduction in breast cancer-related deaths in women in the low-fat (20%) dietary intervention group compared with those who remained on a Standard American Diet (>32% fat) after 19.6 years of follow-up.⁵ A recent systematic review and meta-analysis of prospective studies to clarify the relationship of fruit and vegetable consumption with incident breast cancer suggests that high total fruit and vegetable consumption is associated with a reduced risk of overall, postmenopausal, estrogen/progesterone-receptor positive, and estrogen/progesterone receptor-negative breast cancer; however, fruit juice consumption was associated with an overall increased breast cancer risk.⁶ The Cancer Update Project pooled analysis observed a significant inverse relationship with nonstarchy vegetable consumption and ER-negative breast cancer.¹

Physical activity and breast cancer. According to the CDC, physical activity can prevent one in eight breast cancers. There is convincing evidence demonstrating a dose-response relationship between physical activity and a lower risk of breast cancer, independent of BMI. The favorable effect of exercise on breast cancer risk is attributed to multiple interrelated biologic factors such as effects on menstrual function, body-fat reduction, changes in sex hormone levels, and reduced inflammation. The WCRF/AICR *Diet and Cancer Report* meta-analysis showed a 17% lower risk of breast cancer in premenopausal women with the highest versus lowest "vigorous" physical activity and a 13% lower risk of breast cancer in postmenopausal women with the highest versus lowest "total" physical activity. The Women's Health Initiative followed 155,723 women over a median of 7.3 years and showed a 15% to 23% lower breast cancer risk in the highest recreational physical activity group versus the lowest.⁷ The 2020 American Cancer Society Guidelines for Diet and Physical Activity for Cancer Prevention recommend 150 to 300 minutes of moderate-intensity or 75 minutes of vigorous physical activity weekly.

Alcohol avoidance and breast cancer. There is compelling evidence that alcohol is a carcinogen linked to seven types of major cancers, including breast cancer. In the United States, an estimated 12.1% of female breast cancers were attributable to alcohol, with an estimated 115,794 incident breast cancer cases from 2013 to 2016 (combined) and 11.3% of female breast cancer deaths

(n=18,572).⁸ Women should avoid alcohol for cancer prevention. Any amount of alcohol increases the risk of breast cancer, and greater use is associated with higher risk. This risk is especially high postmenopause. The systemic effects of alcohol contributing to tumorigenesis include elevated acetaldehyde, inflammation, interference with folate metabolism, and increased estradiol.

Given the magnitude of breast cancer occurrence and the accumulated evidence supporting prevention as the most cost-effective long-term strategy for reducing breast cancer risk, lifestyle education centered on the 2018 AICR Cancer Prevention Recommendations should be a core component of routine patient visits and should be encouraged as an overall package. When the AICR Cancer Recommendations are implemented as an overall package, there is robust breast cancer risk reduction. This has been shown in multiple large-scale studies. The Swedish Mammography Cohort Prospective Study included more than 31,000 postmenopausal women who were followed for 15 years and showed a 51% reduced breast cancer risk in the women who met at least six WCRF/AICR recommendations versus two or fewer.⁹ The Vitamins and Lifestyle study included more than 30,000 postmenopausal women who were followed for 7 years and showed a 60% reduction in breast cancer risk in the women who met at least five WCRF/AICR recommendations compared with those who met none.¹⁰ Healthcare professionals are key stakeholders in empowering women to adopt a healthy lifestyle for primary prevention of breast cancer.

Pearls

- For postmenopausal women, there is convincing evidence that adult weight gain and excess adiposity, particularly in the visceral distribution, increases breast cancer risk because of increased estradiol, hyperinsulinemia, and inflammation.
- The use of BMI may underestimate the magnitude of visceral adiposity in postmenopausal women.
- A large-scale, high-quality randomized, controlled trial showed that a low-fat dietary pattern with increased vegetable, fruit, and whole-grain intake resulted in a reduction in breast cancer deaths.
- The CDC estimates that physical activity alone could prevent one in eight breast cancer cases. Women should avoid being sedentary and should participate in regular physical activity.
- Alcohol is a carcinogen. Any amount of alcohol consumption increases breast cancer risk in a dose-dependent manner.
- Breastfeeding decreases a woman's future risk of breast cancer and has health benefits for the baby.

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Disclosures

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