



Physical Activity Can Reduce Early Breast Cancer Risk

New study examines effects of exercise on premenopausal breast cancer

Previous research—such as a 2004 Finnish study and a 2006 analysis of the Iowa Women's Health Study—demonstrated how low- and high-intensity exercise can reduce postmenopausal breast cancer risk. Given that one-fourth of all female breast cancer cases are diagnosed prior to menopause, researchers conducted one of the most significant and detailed investigations of exercise's impact on premenopausal breast cancer, which was published in the May 2008 *Journal of the National Cancer Institute*.

According to the study, "An expert panel of the World Cancer Research Fund/American Institute for Cancer Research and a recent systematic review suggested that physical activity is associated with lower postmenopausal breast cancer incidence but that the relationship for premenopausal breast cancer is uncertain. Further unresolved questions include the role of physical activity at different age periods and intensity of activity on premenopausal breast cancer risk. Physical activity has been hypothesized to reduce breast cancer risk through several mechanisms, including lowering the production or bioavailability of endogenous hormones such as estrogen, insulin, and insulin-like growth factor (IGF), which can act as Mitogens [a chemical substance that encourages cell division]."

Additionally, the study investigators explored the hypothesis that the mechanism by which physical activity acts varies over time. Per their paper, "Exposures during adolescence may be particularly relevant for breast cancer development because this period is characterized by increases in sex hormone levels and rapid proliferation of incompletely differentiated breast tissue.

Among girls, strenuous activity is associated with later menarche [first period] and delayed establishment of regular menstrual cycles."

Conversely in adult women, they say exercise is related to "decreased sex hormone levels, increased frequency of anovulation [no ovulation], and increased incidence of amenorrhea [absence of menstrual periods]. Physical activity during both adolescence and adulthood may confer the greatest benefit for breast cancer risk by lowering lifetime levels of hormone risk factors."

Study design and findings. Grants from the National Cancer Institute and American Cancer Society funded the study. Researchers analyzed self-administered questionnaires of 64,777 premenopausal women who reported leisure-time physical activity (age 12 to current age). The questionnaires were used in the Nurse's Health Study II, an ongoing cohort study that began in 1989 with 116,608 registered nurses, ages 24 to 42.

Biennially, participants were sent a follow-up questionnaire to update information on lifestyle factors and report newly diagnosed conditions. The response rate was approximately 90%; death reports were confirmed via the National Death Index. For their analysis, researchers followed women for six years, starting in 1997 when participants would have been between 33-51 years old. Excluded were any study subjects who died prior to 1997, were diagnosed with noninvasive breast cancer, were postmenopausal or who didn't report their youth-related physical activity.

Per the study, participants were asked in 1997 about their physical activity (outside of work) during five age periods (12-13, 14-17, 18-22, 23-29, 30-34), reporting the average hours per week engaged in these categories:

- Strenuous – running, aerobics, swimming laps, etc.
- Moderate – hiking, walking, casual cycling, yard work, etc.
- Walking to/from school or work
- Total activity

Researchers implemented Cox regression models to examine the relationship of physical activity—per age categories of adolescence, adulthood and lifetime—and invasive premenopausal breast cancer risk. A six-year follow-up revealed 550 women had been diagnosed with breast cancer.

The results showed exercise for women in adolescence and young adulthood "pays off in the long run" and should "encourage young women to exercise regularly," per lead investigator Graham Colditz, MD in a medical news release. He is an epidemiologist, Niess-Gain professor and associate director for Prevention and Control at the Alvin J. Siteman Cancer Center, Washington University School of Medicine and Barnes Jewish Hospital, St. Louis, Missouri. He also served as principal investigator of the Nurses' Health Study, located at the Channing Laboratory, Department of Medicine, Brigham and Women's Hospital from 1999 to 2006.

The findings revealed . . .

- 23% lower breast cancer risk in active women “engaging in 39 or more metabolic equivalent hours per week (MET-h/wk) of total activity on average during their lifetime” equating to 3.25 hours a week of running or 13 hours per week of walking.
- Age-adjusted incidence rates fell from 194 cases per 100,000 person-years in the least active group to 136 cases in the most active group.
- The highest level of physical activity (ages 12-22) contributed most strongly to the exercise/reduced breast cancer link.
- While total lifetime activity appeared to contribute most to risk reduction, even increased activity during adolescence reduced risk later on.

The findings were not about any specific sport, but rather total activity. Limitations did exist in the study, including a generalization to premenopausal white women and data based on recall. Approximately 90% of the cohort “engaged in regular occupational physical activity (walking).” Researchers noted “other lifestyle behaviors may also be important.”

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As with all exercise routines, check with your physician before beginning any program.

Call to women of all ages. Compare this recent study to an analysis performed on over 41,000 postmenopausal women participating in the Iowa Women’s Health Study, which demonstrated similar findings in December 2006.

Similarly, both invasive and in situ breast cancer were inversely associated with long-term physical activity in a study of over 110,000 women, ages 20-79, who were followed for seven years in the California Teachers Study, published in February 2007.

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