

## Breast cancer survivors gain weight at a higher rate than their cancer-free peers

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Mammograms showing a normal breast (left) and a breast with cancer (right).  
Credit: Public Domain

Breast cancer survivors with a family history of the disease, including those who carry BRCA1 and BRCA2 gene mutations, gained more weight over the course of four years than cancer-free women—especially if they were treated with chemotherapy, according to a prospective study by Johns Hopkins Kimmel Cancer Center researchers.

Data from earlier studies suggest that [breast cancer survivors](#) who gain weight may have a higher risk of having their cancer return, the researchers say, noting that gains of 11 pounds or more are also associated with a higher risk of developing cardiovascular disease.

For the study, the researchers reviewed a baseline questionnaire and a follow-up one completed four years later by 303 [breast cancer](#) survivors and 307 cancer-free [women](#) enrolled in an ongoing and long-term study at the Kimmel Cancer Center of women with a [family history](#) of breast or ovarian cancer. Study participants completed a baseline and at least one follow-up questionnaire between 2005 and 2013, and one-quarter of the subjects were premenopausal.

In the four-year span, survivors gained significantly more weight—3.6 pounds on average—than cancer-free women. Among 180 survivors diagnosed with cancer during the last five years of the study period, 37 (21 percent) gained at least 11 pounds over a four-year period compared with 35 of 307 (11 percent) of their cancer-free peers. The weight change findings remained the same after accounting for other factors associated with weight gain, such as increasing age, transition to menopause and level of physical activity, the researchers say.

"Our study suggests that chemotherapy may be one of the factors contributing to weight gain among survivors," says Kala Visvanathan, M.B.B.S., M.H.S., an associate professor of epidemiology at the Johns Hopkins Bloomberg School of Public Health and director of the Clinical Cancer Genetics and Prevention Service at the Kimmel Cancer Center. Women who completed chemotherapy within five years of the study were 2.1 times as likely as cancer-free women to have gained at least 11 pounds during the study.

"There is limited data on weight change in breast cancer survivors, including those at higher risk for the disease compared to the general

population," Visvanathan says. "A lot of studies have focused on breast cancer survivors alone, so we don't get a sense of whether women without cancer gain more or less weight, or whether the gain is due to the cancer or the treatment."

Results of the study by Visvanathan and her colleagues appear online in the July 15 issue of *Cancer Epidemiology, Biomarkers & Prevention*.

Using information from study subjects' answers in detailed questionnaires, along with their medical records, the scientists controlled for such factors as age, menopausal status, physical activity, the presence of cancer-linked mutations in the BRCA genes, and weight at the start of the study when they compared gains in survivors and cancer-free women.

The researchers say they also found a high prevalence of overweight women among the group of 303 breast cancer survivors and 307 cancer-free women with a family history or inherited predisposition for breast cancer, including those who carry BRCA1 or BRCA2 gene mutations, with 46.9 percent of survivors and 55.1 percent of cancer-free women who were overweight or obese.

In addition, breast cancer survivors diagnosed within five years before their baseline weight measurement and who had invasive disease and cancer cells lacking receptors for estrogen gained an average of 7.26 pounds more than cancer-free women.

Statin users among breast cancer survivors treated with chemotherapy also gained more weight—an average of 10 pounds more—than cancer-free women who used statins, as well as survivors and cancer-free women who did not use the cholesterol-blocking drug.

"Above and beyond age and menopausal status, there seems to be a

weight gain associated with treatment of cancer, particularly in women having chemotherapy and those diagnosed with estrogen receptor-negative, invasive cancers," says Amy Gross, M.H.S., a doctoral candidate in epidemiology at the Bloomberg School of Public Health.

The Johns Hopkins study adds to an emerging body of evidence that chemotherapy can lead to weight gain in cancer survivors, Visvanathan noted, but it's not clear why the treatment has this effect. Some scientists suggest that chemotherapy increases inflammation and insulin resistance, disrupting metabolism and producing weight gain. Patients treated with chemotherapy may also be less physically active and prone to weight gain as a result.

"We're looking at biomarkers in urine and blood in our survivors and in women who are cancer-free to look for the biochemical changes that may be related to this higher weight gain," Visvanathan says.

The researchers plan to continue following the full study group every three to four years to determine how the women's weight changes over a longer period of time.

Noting the limits of the study and the need for longer follow-up, Visvanathan cautions that "we're not yet suggesting any [weight gain](#) intervention at the time of chemotherapy."

"But we are suggesting that oncologists, internists or anyone treating breast [cancer survivors](#), including those with a family history of the disease, could help them monitor their weight over the long term," she adds.

The scientists note that the majority of subjects in the current study are Caucasian, which limits their ability to apply their findings to women of other ethnic backgrounds. The study's reliance on self-reported weight

also can be subject to bias or error, but the scientists found a high degree of similarity between self-reported and measured weight among a subgroup of the study participants.

Provided by Johns Hopkins University School of Medicine

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