



## Cornell University Program on Breast Cancer and Environmental Risk Factors in New York State (BCERF)

# A Woman's Body Type and the Risk of Breast Cancer

*A woman's body type can have an effect on her breast cancer risk. Being tall is associated with a small increase in breast cancer risk. Body weight, especially changes in body weight after early adulthood, are important risk factors for postmenopausal breast cancer. Most studies have suggested that breast size has no effect on breast cancer risk.*

### **What aspects of a woman's body type might affect breast cancer risk?**

Many studies have examined the association of different body types and breast cancer risk. Body type characteristics that have been examined are breast size, height, and a number of different features of body weight. The questions below will discuss the results of studies of body type and breast cancer risk.

### **Does a woman's breast size affect her breast cancer risk?**

Most studies have found no association between breast size and breast cancer risk. One carefully conducted study did find an increase in the risk of breast cancer among lean women with larger breasts. In this study, two thousand women were grouped according to their bra size before childbirth. Women who were lean (chest size less than 34 inches) and had larger breasts (size B or C cups) were at significantly higher risk of postmenopausal breast cancer relative to women of the same chest size with an A or smaller cup size. Women with other chest sizes had no association between breast size and breast cancer risk. More studies are needed to confirm these results.

### **Does a woman's height affect her breast cancer risk?**

A woman's height has been associated with breast cancer risk in many studies. Taller women (5 feet 9 inches or taller) have a small increase in risk of both premenopausal and postmenopausal breast cancer compared to shorter women (5 feet 3 inches or shorter).

A person's height is determined by the interaction of genetics, nutrition and hormone levels. How these three factors might affect breast cancer risk is unclear. One possible explanation suggests that the hormones that affect women's height may also cause an increase in the amount of milk duct tissue in the breast. Most breast tumors arise from this tissue and more breast ducts would lead to increased susceptibility to breast cancer.

### **What body characteristics are measured in studies of body weight?**

Studies in humans have examined body weight in a number of ways. A woman's body weight reflects her height, her frame size and the amount of lean and fat body tissue she has. In addition, women carry their body fat on different parts of their bodies. Women



who carry their weight on their upper body and stomach have been described as apple shaped and have large waists in relation to their hips. Women who carry weight on the lower part of their bodies and hips are described as pear shaped and have large hips in relation to their waists.

Many studies examining breast cancer risk have looked directly at weight. Other studies have tried to account for weight differences due to height by using a measure called body mass index. Body mass index is calculated as weight divided by height squared [weight/(height)<sup>2</sup>]. [For more information on body mass index see the National Heart, Lung, and Blood Institute web site on healthy weights ([http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/index.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm))]. Some studies have also examined how weight is carried on the body and others have looked at weight changes over a lifetime.

### **Does a woman's body weight affect her breast cancer risk?**

A woman's body weight does affect her risk of breast cancer but the effect is different for premenopausal and postmenopausal breast cancer. Most studies have found that heavier women (weighing more than 175 pounds) have a lower risk of breast cancer before menopause and higher risk of breast cancer after menopause compared to thinner women (weighing less than 130 pounds). It is important to recognize that the risk of breast cancer is highest after menopause. The results are the same whether body weight is examined directly or if body mass index is used to adjust for the effects of height on body weight.

Several human studies have found that women who carry more of their body fat on their stomach (apple shaped) have higher rates of postmenopausal breast cancer compared to women with more of their body fat around their hips (pear shaped). This seems to be true regardless of women's body weight. The relationship of the location of fat on the body and

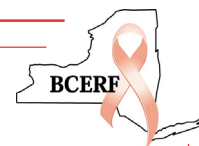
premenopausal breast cancer risk has not been clearly determined.

### **Are there certain ages when body weight affects breast cancer risk most?**

It is not clear if body weight during specific periods of a woman's life is critical for determining breast cancer risk. Few studies have examined body weight at specific ages and breast cancer risk. One such study examined women's weight at 20 years of age and their risk for premenopausal breast cancer. Women who were much lighter or much heavier than average during adolescence or at age 20, had reduced risk of breast cancer compared to average weight women. A second, more extensive study examined women's weight at 5 years, 10 years and 20 years old and the risk of both premenopausal and postmenopausal breast cancer. This study found that a woman's weight at age ten was important. Women, who were heaviest at age ten, had lower risk for both pre- and postmenopausal breast cancer compared to the thinnest women at the same age. This may be a beneficial side effect of high body weight. Nonetheless, high body weight, even at this age, is also associated with other health risks.

### **Does body weight gain affect breast cancer risk?**

Many studies have reported that women who gain weight as adults (after age 18 to 20) have a higher risk of breast cancer after menopause compared to women with stable weight. In one large study, postmenopausal breast cancer risk doubled for women who gained more than 45 pounds after age 18 relative to women who did not gain weight. This result did not include women using postmenopausal hormone treatment because hormone use is also associated with increased risk of breast cancer (See BCERF Fact Sheet #40, *Hormone Treatments and the Risk of Breast Cancer*). These researchers suggested that as much as 16% of all breast cancer cases are the result



of large weight gains during adulthood. On the other hand, studies that examined adult body weight gain in premenopausal women suggest the opposite affect; weight gain may be linked to reduced premenopausal breast cancer risk.

### **Does body weight loss affect breast cancer risk?**

Several studies have suggested that weight loss can affect postmenopausal breast cancer risk. However, the timing of the weight loss may be important. Women who reached their highest weight before age 45 and lost 10 or more pounds had a decreased breast cancer rate after menopause compared to women who did not lose weight. Breast cancer risk of women who reached their highest body weight after age 45 was not affected by weight loss. More study is needed to verify these findings.

The effect of repeated loss and gain of weight on breast cancer risk has not been clearly determined.

### **Why does a higher body weight decrease PREmenopausal breast cancer risk but increase POSTmenopausal breast cancer risk?**

It is not completely clear why high body weight has opposite effects on premenopausal and postmenopausal breast cancer risk. A possible reason for the opposite effects may result from the connection between high exposures to estrogen and other reproductive hormones over a lifetime and increased risk of both pre- and postmenopausal breast cancer (See BCERF Fact Sheet #10, *Estrogen-What Factors Affect a Woman's Exposure to Estrogen*). PREmenopausal women with high weight have been found to have lower levels of estrogens and these women have decreased premenopausal breast cancer risk. POSTmenopausal women with high weight, in contrast, have higher estrogen levels. Although their ovaries no longer produce estrogen after menopause, their fat tissue can make estrogen from other hormones. This results in higher lifetime exposure to

estrogen and these women have increased breast cancer risk.

The association of adult weight gain and postmenopausal breast cancer risk may be the product of the effects of increases in body fat, especially fat carried in the stomach area. Weight gained after adulthood is usually fat tissue and is frequently carried in the stomach and waist area. Stomach or waist fat has been connected with a number of metabolic and hormonal changes in the body, as well as postmenopausal breast cancer risk (see “Does a woman’s body weight affect her breast cancer risk?” above).

### **Do height and body weight affect breast cancer survival?**

Most studies that have examined body types and survival from breast cancer have found that survival is decreased by higher body weight but is not affected by height. Body weight features that increased breast cancer risk were generally found to also decrease survival. Women with a higher body mass index (weight/height ratio) and who carried their weight in their stomach and waist area had poorer survival rates. It is not clear how weight gain or loss after diagnosis affect survival. More studies are needed of weight change after diagnosis and breast cancer survival.

### **What studies are needed?**

More studies are needed in the following areas:

- How specific breast size and body type combinations affect breast cancer risk
- Body weight at specific ages and its effect on breast cancer risk
- Effects on breast cancer risk of weight loss
- Changes in breast cancer survival after weight gains or losses



### What can women do now?

- Maintain a body weight that is neither too thin nor too fat. The National Heart, Lung, and Blood Institute has very good information on healthy weights at their web site ([http://www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/index.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm)).
- Exercise regularly, even small amounts done regularly can make a difference
- Eat lots of whole grains, beans, fruits and vegetables.

An extensive bibliography on “A Woman’s Body Type and the Risk of Breast Cancer” is available on the BCERF web site: <http://www.cfe.cornell.edu/bcerf/>

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*Funding for this fact sheet was made possible by the US Department of Agriculture/Cooperative State Research, Education and Extension Service, the New York State Department of Health and Cornell University. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the US Department of Agriculture or the New York State Department of Health.*

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