

Healthy lifestyle during menopause may decrease breast cancer risk later on

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Obese, postmenopausal women are at greater risk for developing breast cancer and their cancers tend to be more aggressive than those in lean counterparts. A University of Colorado Cancer Center study published in the December issue of the journal *Cancer Research* shows how this risk might be prevented.

"By using nutrient tracers for fat and sugar, we tracked where the body stored excess calories. In lean models, excess fat and glucose were taken up by the liver, mammary and skeletal tissues. In obese models, excess fat and glucose were taken up by tumors, fueling their growth," says Erin Giles, PhD, postdoctoral researcher at the CU Cancer Center and the paper's lead author.

In short, if you are lean, excess calories go to healthy tissue. If you are obese, excess calories feed the tumor.

"This implies that the menopausal window may be an opportunity for women to control their [breast cancer risk](#) through weight management," Giles says.

In this study, Giles worked with a team of scientists including postdoctoral fellows Elizabeth Wellberg and Sonali Jindal, as well as faculty members Steve Anderson, Pepper Schedin, Ann Thor and Paul Maclean. Their study also showed that tumors from obese animals had increased levels of the [progesterone receptor](#), and this receptor appears to give tumors a metabolic advantage for growth. To extend their

findings to humans, they recruited gene analysis experts David Astling and Aik-Choon Tan who analyzed 585 human breast cancers and found that human tumors expressing the progesterone receptor had the same metabolic advantage.

"Basically, we saw an abnormal metabolic response to fat and sugar in the obese that, in many ways, mirrors the response to fat and sugar in [Type II diabetes](#)," Giles says. Noticing this similarity, the group tested the use of the common Type II [diabetes drug](#), Metformin, in their model of postmenopausal [breast cancer](#).

"With treatment, [tumor size](#) was dramatically decreased in the obese, and tumors showed reduced expression of the progesterone receptor," Giles says.

Using a pre-clinical model, the investigators found that weight gain during menopause is particularly bad for those who are obese when entering menopause. Together, the results of this study suggest that the combination of [obesity](#) and weight gain during menopause can impact breast cancer in two ways. First, tumors that arise in obese women appear to have a metabolic advantage, and second, the inability to store excess calories in healthy tissues may further fuel tumor growth.

"While drugs may be useful in controlling breast [cancer risk](#) in obese, postmenopausal women, our results imply that a combination of diet and exercise may be equally if not more beneficial," Giles says.

The group's ongoing studies are testing whether interventions such as diet and exercise, during the period of menopausal weight gain, can improve tumor outcomes.

Provided by University of Colorado Denver

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