

# Hot flashes in cold weather: Study suggests brown adipose tissue activity may explain why

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It seems counter-intuitive for women to experience hot flashes in cold temperatures but, thanks to declining estrogen levels that cause

narrowing of the thermoneutral zone, changes in body core temperature can induce sweating responses in any weather.

According to a new study, presented during the [2023 Annual Meeting of The Menopause Society](#) in Philadelphia, September 27–30, brown adipose tissue activity may be a key reason why.

"How can I be hot and cold at the same time?" It's a common question asked by perimenopausal women. And the answer may be the activation of brown adipose tissue (BAT), which is a specialized fat tissue that stores energy and helps to produce heat as a means to maintain body [temperature](#). BAT is activated in response to [cold temperatures](#) and burns calories.

In what is believed to be the first study focused on the association between BAT activation and hot flashes, researchers studied 269 women, most of whom were peri- or postmenopausal. Their goal was to test the hypothesis that women with more BAT activity would be more likely to have hot flashes during the coldest months of the year.

The hypothesis is based on the fact that declining levels of estrogen result in a narrowing of the thermoneutral zone—between the temperatures that provoke shivering and sweating—and this narrowing contributes to a greater likelihood of hot flashes. Even small changes in the core body temperature can induce sweating responses, and small increases in [core body temperature](#) have been documented prior to hot flash occurrence.

Based on logistic regression models, the researchers concluded that BAT activity was significantly associated with an increase in the odds of bothersome hot flashes. In the logistic regression model with estimated BAT activity, [menopause](#) status, BMI, and financial comfort, an increase in BAT activity almost tripled the likelihood of hot flashes, one of the

most commonly reported menopause-related symptoms.

Dr. Lynnette Leidy Sievert from the University of Massachusetts Amherst and Dr. Daniel E. Brown from the University of Hawaii at Hilo led the study. They suggest that, in addition to considering the role of BAT in lipid and [glucose metabolism](#), diabetes and obesity, additional research is required to further examine the role of BAT in relation to hot flashes, especially in cool ambient temperatures.

"As biological anthropologists, Dr. Brown and I consider symptoms at midlife to be an aspect of human variation. We look at human biology in ecological context, so it wasn't a stretch to wonder if the way we adapt to the cold through BAT activity might contribute to variation in hot [flash](#) experience," says Dr. Sievert

"Hot flashes are one of the most commonly reported symptoms of menopause," says Dr. Stephanie Faubion, medical director for The Menopause Society. "It's important to consider these new studies as [hot flashes](#) can effect a woman's overall quality of life."

Provided by The North American Menopause Society

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