

# Three things every woman should know about stroke risk

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Dr. Tracy Madsen has been studying the topic of women and stroke since beginning her residency in emergency medicine at Brown's Warren Alpert Medical School in 2008. She originally focused on the disparities in the treatment of women in the emergency department.

"The E.D. was an important setting for me, because that's where I care for patients," said Madsen, an associate professor of [emergency medicine](#) and epidemiology at Brown and attending physician at the Miriam Hospital and Rhode Island Hospital. "I've always been very interested in learning whether women who came to the E.D. with [stroke symptoms](#) were receiving the care they should be receiving."

Over time, other stroke specialists came to share Madsen's research interests.

"When I first started doing some of this work 10 years ago, it felt like there weren't that many people working in this area, but the number of investigators who are actively working on ways to improve stroke care for women has expanded significantly," Madsen said. "Understanding how to improve stroke care for women will not only elevate stroke care for women, but will ultimately improve [stroke care](#) for all."

Madsen has participated in more than 35 research projects on women and stroke, focused not only on clinical care and treatment but also risk factors.

A woman's stroke risk changes with age, she noted: The likelihood of a stroke is higher during pregnancy and increases again during and after menopause. Elderly women are the most likely to have a severe and debilitating stroke.

In the United States, one in five women between ages 55 and 75 will have a stroke, according to the U.S. Centers for Disease Control and Prevention; stroke is the third leading cause of death for women. Yet four in five strokes are preventable, Madsen said, which is why it's important for researchers and clinicians to understand the risk factors and educate women on how they can protect themselves.

With the incidence of risk so significant, Madsen shared three insights from her recent research projects on women and stroke.

## **The most common stroke risk factors are even riskier for women**

The most common stroke risk factors are high blood pressure and diabetes. But risk levels and severity [differ by sex](#), Madsen said. In a 2019 [study](#) of over 26,000 participants, Madsen and other researchers found that risk of stroke per each level of hypertension was higher in women. Compared to men with high blood pressure, women with high blood pressure were even more likely to have a severe stroke.

Another [study](#) led by Madsen found that women with a high fasting blood glucose level, which is a marker of diabetes, had a higher risk than men of ischemic stroke, which is the most common kind. She said findings from studies like these could inform sex-specific guidelines for the care and treatment of hypertension and diabetes in order to reduce a patient's risk of stroke.

"Knowing how traditional stroke risk factors such as [high blood pressure](#) differ between women and men is critical," Madsen said. "Not only does this evidence reinforce the need for screening and treatment of [risk factors](#) across the life span, from early adulthood through midlife and postmenopause, but it also has the potential to inform future changes to guidelines."

## **Migraines matter—even if women no longer have them**

Migraine is two to three times more common in women than men. There is solid data that migraine with aura—also known as classic migraine,

which involves headaches as well as flashes of light, blind spots and other visual abnormalities—is considered to be a risk factor for stroke.

Most of the data that informed this knowledge, however, comes from studies of women in midlife. Madsen and her team are now focusing on older women, and studying whether a woman's lifetime history of migraine means that she might be at higher risk for a stroke later in life, such as when she's in her 60s or 70s—even if she no longer has migraines.

"Understanding this risk could help doctors provide safer care for postmenopausal women," Madsen said, "such as guiding decisions on whether or not to prescribe medication for other conditions that may have a side effect of increasing risk of stroke."

This two-year study will end in 2025, and results could shape future care for both migraine and stroke.

## **Hormones could be used as a tool to predict stroke risk**

Researchers don't know exactly what explains sex differences in risk with age and how conditions like blood pressure affect risk—but sex hormones appear to play an important role, Madsen said. She has been involved in multiple projects examining how and why hormones may account for sex differences in stroke risk.

In a 2020 [analysis](#) of data from the Women's Health Initiative, an ongoing national study, Madsen and other researchers found that low levels of circulating sex hormone-binding globulin, a hormone closely linked to estrogen and testosterone, were associated with a higher risk of ischemic stroke in postmenopausal women. She is currently leading

additional studies exploring how hormone levels could be used to identify women at the highest risk of a debilitating stroke.

Provided by Brown University

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