

# What you should know about MINOCA, a type of heart attack mostly affecting women

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Heart disease is the leading cause of death among women in the U.S., and a type of heart attack called myocardial infarction with non-obstructive coronary arteries (MINOCA), which predominantly affects women, is garnering increased attention.

In observance of American Heart Month in February and Cedars-Sinai's

18th annual National Wear Red Day event on Feb. 3 to raise awareness of women's [heart](#) health, the Cedars-Sinai Newsroom sat down with Janet Wei, MD, and Noel Bairey Merz, MD, cardiologists in the Smidt Heart Institute at Cedars-Sinai, to learn more about MINOCA.

Wei is associate medical director of the Biomedical Imaging Research Institute at Cedars-Sinai and co-director of the Stress Echocardiography Lab at the Smidt Heart Institute. Bairey Merz is director of the Barbra Streisand Women's Heart Center and director of the Linda Joy Pollin Women's Heart Health Program at the Smidt Heart Institute.

## **What is MINOCA?**

MINOCA is a [heart attack](#) caused by poor [blood flow](#) to the heart, despite no evidence of major blockage in the [arteries](#). A troubling aspect of MINOCA is that often when we diagnose a heart attack, we rely on a single imaging method—invasive coronary angiogram—to tell us if there's a big blockage in the coronary arteries. With MINOCA, the angiogram can look normal because we don't see a blocked artery, and then patients don't know why they had a heart attack.

## **MINOCA primarily affects women—tell us more about this.**

Compared to heart attacks with obstructive coronary artery disease, MINOCA patients are more likely to be female and younger, and they're also more likely to be Black or Hispanic/Latino. Prior studies have shown that Black or Hispanic patients—in particular, young Black women—have a lower prevalence of obstructive coronary artery disease than white/non-Hispanic patients when they come to us with chest pain or are being evaluated for heart attack. It's unclear if this difference is due to disparities in healthcare referral patterns for testing or racial/ethnic differences.

## What causes MINOCA?

There can be different causes. Even with no obstructive coronary arteries, MINOCA can still occur because of atherosclerosis (plaque buildup). But instead of the plaque rupturing and blocking the whole artery, with MINOCA, it's due to an erosion rather than a rupture. So, the surface of the plaque may be disrupted, but there's no big clot blocking the blood vessel and therefore, we can't see it on routine angiography.

There are other causes of MINOCA that are more common in women than men. These include coronary artery spasms, which cause poor blood flow to the heart. Also, a spontaneous coronary artery dissection, which is when the blood vessel tears. This is the most common cause of heart attacks in pregnant and postpartum women.

## What are the symptoms and risk factors?

The signs and [symptoms](#) are the same as a heart attack in someone who has blocked arteries—chest discomfort (pain, pressure, tightness), shortness of breath, nausea, lightheadedness. There are some shared risk factors—high blood pressure, high cholesterol, diabetes, smoking—but they are less frequent in MINOCA patients than in patients who've had heart attacks with obstructive coronary disease. We're still trying to understand what contributes to MINOCA, mainly because it could be caused by many different things—spasm, dissection or even an embolism.

## How is MINOCA treated?

The same way as other heart attacks: antiplatelet therapy, statins, ACE-inhibitors/angiotensin receptor blockers and beta-blockers. However, we think these therapies should be tailored in patients with MINOCA,

particularly in those without atherosclerosis. Large trials are needed to help us determine how to best treat MINOCA patients.

## **What research is underway to better understand MINOCA?**

We previously participated in the Heart Attack Research Program, supported by the American Heart Association, in which advanced imaging techniques were tested to help us better understand MINOCA in women. We found that a combination of imaging techniques allowed us to diagnose the cause of MINOCA in over 80% of cases. The study has since expanded to include men.

We need more research into treatments. Because we don't fully understand why MINOCA may have happened, we can't tailor our treatment. The Women's Heart Center at Cedars-Sinai is currently leading the WARRIOR clinical trial (designed by Bairey Merz), testing whether standard therapy used for obstructive coronary artery disease is effective for women with chest pain and no obstructions. Some of the [women](#) enrolled have experienced MINOCA.

## **What do you wish more people knew about MINOCA?**

That heart attacks can occur for a variety of reasons, and the absence of obstructive coronary artery disease does not mean it's not a heart attack.

Provided by Cedars-Sinai Medical Center

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