

# Heart Disease: 7 Differences Between Men and Women

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While heart disease is still the number one cause of death in men and women, it can develop and present in dramatically different ways across the sexes.

## 1 - Men and women have differences in biology

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Men and women display differences in their anatomy and physiology, from the lungs and brain to muscles and joints. Men and women also have differences in their cardiovascular systems. Compared to men, women have smaller hearts and narrower blood vessels.

“Because of these biological differences, heart disease can progress differently in women when compared to men,” says Michelle O’Donoghue, MD, a cardiovascular medicine specialist at Brigham Health and senior investigator with the TIMI Study Group, where she leads clinical trials examining how heart disease differs between men and women.

And yet, until recently, women with heart disease have been diagnosed and treated like men—with the same tests, same procedures, and same medications.

## 2 - Men and women experience cholesterol buildup in different areas

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A heart attack occurs when cholesterol plaque builds up inside the walls of arteries and causes damage in the major blood vessels.

Men typically develop this plaque buildup in the largest arteries that supply blood to the heart. Women are more likely to develop this buildup in the heart’s smallest blood vessels, known as the microvasculature.

Furthermore, heart disease in both sexes is only partly related to the accumulation of cholesterol. “Inflammation also plays an important role and may contribute to the differences we see in women with heart disease,” says Dr. O’Donoghue.

## 3 - Men and women have different symptoms of a heart attack

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A heart attack does not always look or feel the same in women compared to men. Men typically present to healthcare providers with chest pressure.

Women also experience chest pressure (it’s still the leading complaint), but they are more likely than men to also report:

- Nausea
- Sweating
- Vomiting
- Pain in the neck, jaw, throat, abdomen or back

## 4 - Women may have diseases that mimic a heart attack

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Women are more likely than men to suffer from diseases that mimic a heart attack. For instance, women are more likely to experience:

- **A coronary spasm:** a blood vessel clamps down and mimics a heart attack.
- **A coronary dissection:** the wall of a blood vessel tears.
- **Takotsubo cardiomyopathy:** an inflammatory response that causes the heart to enlarge after an emotional stressor (also called broken heart syndrome).

“It’s still under-recognized among clinicians that heart disease isn’t identical across the sexes. It’s usually an ‘aha’ moment when a provider realizes how many alternate diagnoses they should consider when diagnosing a female patient,” says Dr. O’Donoghue.

## 5 - Men and women may have different risk factors for a heart disease

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A woman's reproductive history may affect her risk of developing heart disease. In fact, certain diseases that develop during pregnancy, such as preeclampsia and gestational diabetes, may be powerful predictors of future risk of heart disease.

A 2016 study from investigators at Brigham Health showed that women age 40 or younger with endometriosis were three times more likely to develop heart attack, chest pain, or require treatment for blocked arteries, compared to women without endometriosis in the same age group.

“Women with endometriosis, preeclampsia or gestational diabetes should adopt heart-healthy lifestyle habits. Familiarize yourself with the signs and symptoms of a heart attack, and ask your physician to assess your risk of heart disease,” says Dr. O’Donoghue.

The Cardiovascular Disease and Pregnancy Program at Brigham Health provides specialized care for women with cardiovascular disease before, during and after pregnancy. At the Center, cardiologists and obstetricians collaborate to identify and modify risk factors early to prevent heart disease before it develops.

## 6 - Men and women require different diagnostic care

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When a woman presents to a healthcare provider with signs and symptoms of a heart attack, they may receive different diagnostic care than a man.

For instance, if a heart attack is suspected, both men and women receive a cardiac troponin (cTn) test, which measures circulating levels of troponin. This protein is released in the blood when a heart attack has damaged heart muscle. Higher levels of troponin indicate higher levels of heart damage. But the clinical threshold that signals a heart attack may differ across the sexes.

“Some women may be having a heart attack but are falling below the level of detection. Providers are only starting to apply sex-specific thresholds for certain diagnostic tests,” says Dr. O’Donoghue.

Another diagnostic test, cardiac catheterization, has long been the gold standard for diagnosing a heart attack, but this test looks for blockages in large arteries. Since women are more likely than men to experience more plaque buildup in the smallest arteries, this test may not be the most appropriate to diagnose heart disease in women.

“If a cardiac catheterization doesn’t give clinicians the answers they were expecting, women should ask if other testing is appropriate. This may include a cardiac MRI to look for inflammation of the heart, or intracoronary imaging to look at the inside of blood vessel walls within the heart,” says Dr. O’Donoghue.

At the Center for Cardiovascular Disease in Women, clinicians tailor diagnostic and treatment services toward women. This includes intravascular ultrasound that may better detect heart disease in women. The Center has long been a provider of clinical care, research, patient and provider education, and community outreach and advocacy.

## 7 - Men and women may require different treatments for heart disease

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Medical providers have decades of experience treating the typical cholesterol plaque buildup in largest blood vessels of the heart. But there’s a weaker understanding of how to treat plaque in the microvasculature, or inflammation of the heart.

That said, a growing number of clinicians are beginning to approach treatment decisions with the knowledge that women may benefit from treatments that are different from those used in men, from subtle calibrations in pacemakers to variations on angioplasty.

Ultimately, clinical trials will better inform clinicians about treatment differences between men and women. Researchers at the Mary Horrigan Connors Center for Women’s Health and Gender Biology are dedicated to investigating these differences and translating their discoveries into delivery of care.

In 2019, Dr. O'Donoghue received the Women's Health Access Matters (WHAM!) Investigators Fund from the Mary Horrigan Connors Center for Women's Health and Gender Biology to examine sex-specific pathways that contribute to heart disease.

## How to Lower Your Risk of Heart Disease

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Heart disease is avoidable, even if it runs in your family. Lifestyle changes can have a large impact in preventing cardiovascular disease, or in keeping it from worsening.

It's important to recognize the signs and symptoms of a heart attack, which can include uncomfortable pressure, burning, or squeezing sensations in the chest, and pain in the chest, neck, arm, or back.

Keep in mind that heart attack symptoms are not the same for everyone and, of course, differ between men and women, with women more likely to experience nausea, sweating, vomiting, and pain in the neck, jaw, throat, abdomen or back.

If you're concerned about any of these symptoms, contact your healthcare provider. If you're unsure, don't wait – call 911 for help.

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