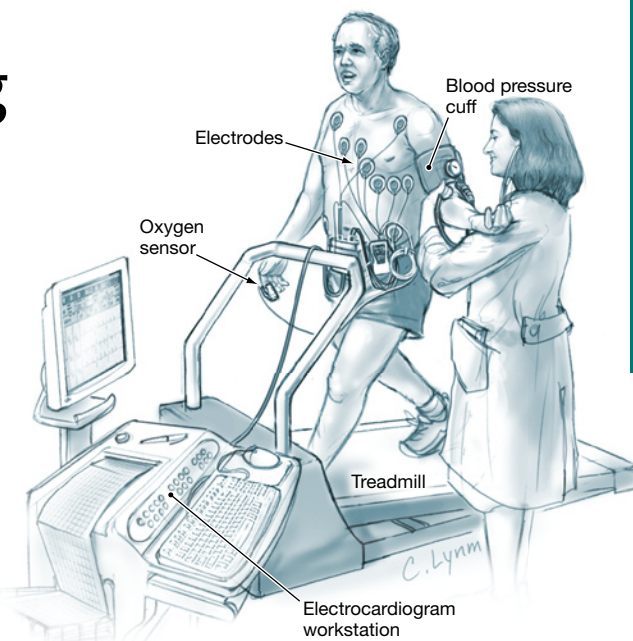


# Cardiac Stress Testing

**C**ardiovascular (heart and blood vessel) disease is the leading cause of death in developed nations. Assessing the heart's function and examining the seriousness of **coronary artery** (the blood vessels of the heart) disease are the goals of cardiac stress testing. Putting stress on the heart, such as with exercise or certain medications, makes the heart work harder. Under these conditions, **myocardial ischemia** (diminished blood flow to the heart muscle) may occur. As part of an evaluation for cardiovascular disease in someone with chest pain (in addition to an **electrocardiogram** [ECG]), cardiac stress testing may be helpful in determining the need for invasive tests such as **coronary angiography**—visualizing coronary arteries after injecting dye through a **cardiac catheter** (tube inserted into the heart). The October 15, 2008, issue of *JAMA* includes an article about cardiac stress testing.



## TYPES OF CARDIAC STRESS TESTS

- Exercise stress tests use cardiac monitoring while an individual walks on a treadmill with an increasingly steep incline. Technicians measure the heart rate, time walked on the treadmill, and the effort during the test, and the doctor looks for ECG changes.
- Nuclear stress tests use an injection of a **radionuclide** (a compound with a slight amount of radioactivity) to track blood flow and the pattern of ischemia when the heart is stressed (either with exercise or with medication).
- Pharmacologic stress tests, often used for persons who cannot walk for more than a short distance, use drugs that put stress on the heart muscle. ECG and other cardiac monitors record data, including heart rate and rhythm. Changes in the ECG and/or cardiac imaging may indicate ischemia.
- **Echocardiography** (using sound waves to look at heart structures and at blood flow in the heart's chambers) can be combined with stress testing to examine the function of the heart at rest and under stress conditions.

## REASONS FOR HAVING A STRESS TEST

- Persons who have symptoms of heart disease should be evaluated by their doctor and may need to have a stress test. Symptoms of cardiac disorders include chest, arm, or jaw pain (**angina**); shortness of breath; swelling of the lower legs and feet; **palpitations** (irregular heart rate); and unexplained fatigue or nausea. Unfortunately, sudden cardiac death is often the first sign that a person has heart disease. Women with cardiac disease may not always display the classic signs of chest or left arm pain. Sometimes, upper abdominal pain, especially in an older person with risk factors for heart disease, may be a symptom of heart disease.
- Sedentary persons who are planning to start a vigorous exercise program sometimes are advised to undergo a stress test prior to initiation of the new regimen.

Sources: American Heart Association; National Heart, Lung, and Blood Institute; American College of Cardiology

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## FOR MORE INFORMATION

- National Heart, Lung, and Blood Institute  
[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)
- American Heart Association  
[www.americanheart.org](http://www.americanheart.org)
- American College of Cardiology  
[www.acc.org](http://www.acc.org)

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To find this and previous JAMA Patient Pages, go to the Patient Page Index on JAMA's Web site at [www.jama.com](http://www.jama.com). Many are available in English, Spanish, and French. A Patient Page on myocardial infarction was published in the January 30, 2008, issue; one on percutaneous coronary intervention in the February 11, 2004, issue; one on acute coronary syndromes in the July 2, 2008, issue; one on cardiac arrest in the January 4, 2006, issue; one on electrocardiograms in the September 13, 2006, issue; and one on heart failure was published in the June 13, 2007, issue.