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## Heart Health Tests

Also called: Cardiac Diagnostic Tests

Heart diseases [<https://medlineplus.gov/heardiseases.html>] are the number one killer in the United States. They are also a major cause of disability [<https://medlineplus.gov/disabilities.html>]. If you do have heart disease, it is important to find it early, when it is easier to treat. Blood tests and heart health tests can help find heart diseases or identify problems that can lead to heart diseases. There are several different types of heart health tests. Your health care provider will decide which test or tests you need, based on your symptoms (if any), risk factors [<https://medlineplus.gov/howtopreventheartdisease.html>], and medical history.

### Cardiac Catheterization

Cardiac catheterization is a medical procedure used to diagnose and treat some heart conditions. For the procedure, your provider puts a catheter (a long, thin, flexible tube) into a blood vessel in your arm, groin, or neck, and threads it to your heart. The provider can use the catheter to:

- Do a coronary angiography. This involves putting a special type of dye in the catheter, so the dye can flow through your bloodstream to your heart. Then your provider takes x-rays [<https://medlineplus.gov/xrays.html>] of your heart. The dye allows your provider to see your coronary arteries on the x-ray, and to check for coronary artery disease [<https://medlineplus.gov/coronaryarterydisease.html>] (CAD). CAD is caused by plaque buildup in the arteries [<https://medlineplus.gov/atherosclerosis.html>].
- Take samples of your blood and heart muscle.
- Examine your heart valves [<https://medlineplus.gov/heartvalvediseases.html>].
- Do procedures such as angioplasty [<https://medlineplus.gov/angioplasty.html>] or minor heart surgeries [<https://medlineplus.gov/heartsurgery.html>] to repair congenital heart defects [<https://medlineplus.gov/congenitalheartdefects.html>] or replace heart valves.

### Cardiac CT Scan

A cardiac CT (computed tomography [<https://medlineplus.gov/ctscans.html>]) scan is a painless imaging test that uses x-rays to take detailed pictures of your heart and its blood vessels. Computers can combine these pictures to create a three-dimensional (3D) model of your whole heart. This test can help providers detect or evaluate various heart problems, including:

- Coronary artery disease
- Calcium buildup in the coronary arteries
- Congenital heart defects
- Problems with the aorta (the main artery that carries blood away from the heart)
- Problems with heart function and valves
- Pericardial diseases [<https://medlineplus.gov/pericardialdisorders.html>]

Before you have the test, you get an injection of contrast dye. The dye highlights your heart and blood vessels in the pictures. The CT scanner is a large, tunnel-like machine. You lie still on a table that slides you into the scanner, and the scanner takes the pictures.

## **Cardiac MRI**

Cardiac MRI (magnetic resonance imaging [<https://medlineplus.gov/mriscans.html>]) is a painless imaging test that uses radio waves, magnets, and a computer to create detailed pictures of your heart. It can help your provider figure out whether you have heart disease, and if so, how severe it is. A cardiac MRI can also help your provider decide the best way to treat heart problems such as:

- Congenital heart defects
- Coronary artery disease
- Heart valve problems
- Pericarditis
- Cardiac tumors
- Damage from a heart attack [<https://medlineplus.gov/heartattack.html>]

The MRI is a large, tunnel-like machine. You lie still on a table that slides you into the MRI machine. The machine makes loud noises as it takes pictures of your heart. Sometimes before the test, you might get an injection of contrast dye. The dye highlights your heart and blood vessels in the pictures.

## **Chest X-Ray**

A chest x-ray creates pictures of the organs and structures inside your chest, such as your heart, lungs, and blood vessels. It can reveal signs of heart failure [<https://medlineplus.gov/heartfailure.html>], as well as lung disorders and other causes of symptoms not related to heart disease.

## **Coronary Angiography**

Coronary angiography (angiogram) is a procedure that uses contrast dye and x-ray pictures to look at the insides of your arteries. It can show whether plaque is blocking your arteries and how severe the blockage is. Providers use this procedure to diagnose heart diseases after chest pain [<https://medlineplus.gov/chestpain.html>], sudden cardiac arrest [<https://medlineplus.gov/suddencardiacarrest.html>] (SCA), or abnormal results from other heart tests such as an EKG or a stress test.

You usually have a cardiac catheterization to inject the dye into your coronary arteries. Then the provider will take special x-rays while the dye is flowing through your coronary arteries. The dye lets your provider study the flow of blood through your heart and blood vessels.

## **Echocardiography**

Echocardiography, or echo, is a painless test that uses sound waves to create moving pictures of your heart. The pictures show the size and shape of your heart. They also show how well your heart's chambers and valves are working. Providers use an echo to diagnose many different heart problems, and to check how severe they are.

There are several different types of echocardiography. For transthoracic echocardiography (the most common type), a technician applies gel to your chest. The gel helps sound waves reach your heart. The technician moves a transducer (wand-like device) across your chest. The transducer connects to a computer. It transmits ultrasound waves into your chest, and the waves bounce (echo) back. The computer converts the echoes into pictures of your heart.

## **Electrocardiogram [<https://medlineplus.gov/lab-tests/electrocardiogram/>] (EKG), (ECG)**

An electrocardiogram, also called an ECG or EKG, is a painless test that detects and records your heart's electrical activity. It shows how fast your heart is beating and whether its rhythm is steady or irregular.

An EKG may be part of a routine exam to screen for heart disease. Or you may get it to detect and study heart problems such as heart attacks, arrhythmia [<https://medlineplus.gov/arrhythmia.html>], and heart failure.

For the test, you lie still on a table and a nurse or technician attaches electrodes (patches that have sensors) to the skin on your chest, arms, and legs. Wires connect the electrodes to a machine that records your heart's electrical activity.

## Stress Testing [<https://medlineplus.gov/lab-tests/electrocardiogram/>]

Stress testing looks at how your heart works during physical stress. It can help to diagnose coronary artery disease, and to check how severe it is. It can also check for other problems, including heart valve disease and heart failure.

For the test, you exercise (or are given medicine if you are unable to exercise) to make your heart work hard and beat fast. While this is happening, you get an EKG and blood pressure monitoring. Before or after the test, you might also have an echocardiogram, or other imaging tests such as a nuclear scan [<https://medlineplus.gov/nuclearscans.html>]. For the nuclear scan, you get an injection of a tracer (a radioactive substance), which travels to your heart. Special cameras detect the energy from the tracer to create pictures of your heart. You have pictures taken after you exercise, and then after you rest.

*NIH: National Heart, Lung, and Blood Institute*

## Start Here

- Heart Tests [<https://www.nhlbi.nih.gov/health/heart-tests>]  (National Heart, Lung, and Blood Institute)  
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/estudios-cardiacos>]
- Heart-Health Screenings [<https://www.heart.org/en/health-topics/consumer-healthcare/what-is-cardiovascular-disease/heart-health-screenings>] (American Heart Association)
- Picturing the Heart [<https://www.nibib.nih.gov/picturing-heart>]  (National Institute of Biomedical Imaging and Bioengineering)

## Related Issues

- Heart Health Tests for People with Diabetes [<https://www.heart.org/en/health-topics/diabetes/symptoms-diagnosis--monitoring-of-diabetes/heart-health-tests-for-diabetes-patients>] (American Heart Association)
- Radiation from Cardiac Imaging Tests [<https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.112.146043>] (American Heart Association)

## Specifics

- Catheter Angiography [<https://www.radiologyinfo.org/en/info/angiocath>]  
 (American College of Radiology; Radiological Society of North America)  
Also in Spanish [<https://www.radiologyinfo.org/es/info/angiocath>]
- Coronary CTA (Computed Tomography Angiography) [<https://www.radiologyinfo.org/en/info/angiocorct>]  
(American College of Radiology; Radiological Society of North America)  
Also in Spanish [<https://www.radiologyinfo.org/es/info/angiocorct>]
- CT Angiography (CTA) [<https://www.radiologyinfo.org/en/info/angiocat>]  
 (American College of Radiology; Radiological Society of North America)  
Also in Spanish [<https://www.radiologyinfo.org/es/info/angiocat>]
- Doppler Ultrasound [<https://medlineplus.gov/lab-tests/doppler-ultrasound/>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/ecografia-doppler/>]
- Ejection Fraction Heart Failure Measurement [<https://www.heart.org/en/health-topics/heart-failure/diagnosing-heart-failure/ejection-fraction-heart-failure-measurement>] (American Heart Association)
- Electrocardiogram [<https://medlineplus.gov/lab-tests/electrocardiogram/>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/electrocardiograma/>]
- MR Angiography (MRA) [<https://www.radiologyinfo.org/en/info/angiomr>]  
 (American College of Radiology; Radiological Society of North America)  
Also in Spanish [<https://www.radiologyinfo.org/es/info/angiomr>]
- Pulse Oximetry [<https://medlineplus.gov/lab-tests/pulse-oximetry/>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/pulsioximetria/>]
- Stress Tests [<https://medlineplus.gov/lab-tests/stress-tests/>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/pruebas-de-esfuerzo/>]
- Tests for Lung Disease [<https://www.nhlbi.nih.gov/health/lung-tests>]  (National Heart, Lung, and Blood Institute)

## Videos and Tutorials

- Cardiovascular system [<https://medlineplus.gov/ency/anatomyvideos/000023.htm>]  (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/anatomyvideos/000023.htm>]

## Clinical Trials

- ClinicalTrials.gov: Heart Imaging Tests [<https://clinicaltrials.gov/search?cond=%22heart+diseases%22&intr=imaging&aggFilters=status:not%20rec>]  (National Institutes of Health)
- ClinicalTrials.gov: Stress Testing [<https://clinicaltrials.gov/search?cond=heart&intr=%22stress+testing%22&aggFilters=status:not%20rec>]  (National Institutes of Health)

## Journal Articles

References and abstracts from MEDLINE/PubMed (National Library of Medicine)

- Article: Interpenetrating network hydrogel-loaded embryonic stem cell-derived endocardial cells improves cardiac function... [<https://www.ncbi.nlm.nih.gov/pubmed/40448180>]
- Article: Invasive coronary function testing in clinical practice: Implementing the 2024 ESC... [<https://www.ncbi.nlm.nih.gov/pubmed/40122215>]
- Article: Inter- and Intrahospital Price Variation for Common Cardiovascular Admission Diagnoses, Diagnostic... [<https://www.ncbi.nlm.nih.gov/pubmed/40094183>]
- Heart Health Tests -- see more articles [<https://pubmed.ncbi.nlm.nih.gov/?term=%22Heart+Function+Tests%22%5Bmajr%3Aexp%5D+OR+%22Diagnostic+Techniques%2C+Cardiovascular%22%5Bmajr%3Aexp%5D+AND+humans%5Bmh%5D+AND+english%5Bla%5D+AND+%22last+3+Years%22+%5Bedat%5D+NOT+%28letter%5Bpt%5D+OR+case+reports%5Bpt%5D+OR+editorial%5Bpt%5D+OR+comment%5Bpt%5D%29>]

## Reference Desk

- Heart Anatomy [<https://www.texasheart.org/heart-health/heart-information-center/topics/heart-anatomy/>] (Texas Heart Institute)  
Also in Spanish [<https://www.texasheart.org/heart-health/heart-information-center/topics/anatomia-del-corazon/>]
- Heart Information Center [<https://www.texasheart.org/heart-health/heart-information-center/>] (Texas Heart Institute)  
Also in Spanish [<https://www.texasheart.org/heart-health/heart-information-center/topics/glosario-de-terminologia-cardiovascular/>]
- How the Heart Works [<https://www.nhlbi.nih.gov/health/heart>]  (National Heart, Lung, and Blood Institute)  
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/corazon>]

## Find an Expert

- American Heart Association [<https://www.heart.org/en/>]
- Doctor Finder (Database of Interventional Radiologists) [<https://www.sirweb.org/doctor-finder/>]  
(Society of Interventional Radiology)
- National Heart, Lung, and Blood Institute [<https://www.nhlbi.nih.gov/>] 

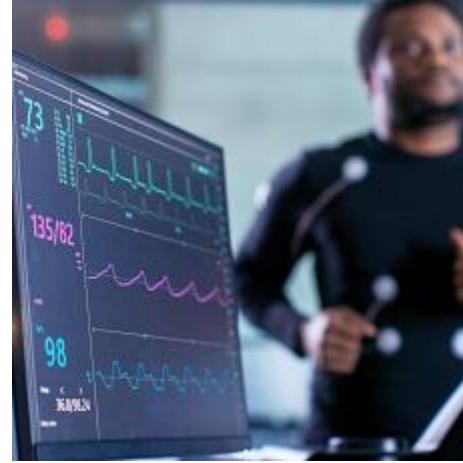
## Children

- Cardiac Catheterization [<https://kidshealth.org/en/parents/cardiac-catheter.html>] (Nemours Foundation)  
Also in Spanish [<https://kidshealth.org/es/parents/cardiac-catheter.html>]

## Patient Handouts

- Cardiac catheterization - discharge [<https://medlineplus.gov/ency/patientinstructions/000096.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/patientinstructions/000096.htm>]
- Echocardiogram [<https://medlineplus.gov/ency/article/003869.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/003869.htm>]

- Echocardiogram - children [<https://medlineplus.gov/ency/article/007669.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/007669.htm>]
- Exercise stress test [<https://medlineplus.gov/ency/article/003878.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/003878.htm>]



## MEDICAL ENCYCLOPEDIA

Aortic angiography [<https://medlineplus.gov/ency/article/003814.htm>]

Cardiac catheterization [<https://medlineplus.gov/ency/article/003419.htm>]

Cardiac catheterization - discharge [<https://medlineplus.gov/ency/patientinstructions/000096.htm>]

Cardiac event monitors [<https://medlineplus.gov/ency/article/007700.htm>]

Cardiac intravascular ultrasound [<https://medlineplus.gov/ency/article/007266.htm>]

Cardiovascular system [<https://medlineplus.gov/ency/anatomyvideos/000023.htm>]

Coronary angiography [<https://medlineplus.gov/ency/article/003876.htm>]

CT angiography - chest [<https://medlineplus.gov/ency/article/007676.htm>]

Echocardiogram [<https://medlineplus.gov/ency/article/003869.htm>]

Echocardiogram - children [<https://medlineplus.gov/ency/article/007669.htm>]

Electrocardiogram [<https://medlineplus.gov/ency/article/003868.htm>]

Exercise stress test [<https://medlineplus.gov/ency/article/003878.htm>]

Heart CT scan [<https://medlineplus.gov/ency/article/007344.htm>]

Heart MRI [<https://medlineplus.gov/ency/article/003795.htm>]

His bundle electrography [<https://medlineplus.gov/ency/article/003391.htm>]

Holter monitor (24h) [<https://medlineplus.gov/ency/article/003877.htm>]

Left heart ventricular angiography [<https://medlineplus.gov/ency/article/003875.htm>]

Nuclear ventriculography [<https://medlineplus.gov/ency/article/003822.htm>]

Right heart ventricular angiography [<https://medlineplus.gov/ency/article/003874.htm>]

Stress echocardiography [<https://medlineplus.gov/ency/article/007150.htm>]

## Related Health Topics

Cholesterol Levels: What You Need to Know [<https://medlineplus.gov/cholesterollevelswhatyouneedtoknow.html>]

CT Scans [<https://medlineplus.gov/ctscans.html>]

Diagnostic Imaging [<https://medlineplus.gov/diagnosticimaging.html>]

How to Prevent Heart Disease [<https://medlineplus.gov/howtopreventheartdisease.html>]

MRI Scans [<https://medlineplus.gov/mriscans.html>]

Nuclear Scans [<https://medlineplus.gov/nuclearscans.html>]

X-Rays [<https://medlineplus.gov/xrays.html>]

## National Institutes of Health

The primary NIH organization for research on *Heart Health Tests* is the National Heart, Lung, and Blood Institute [<http://www.nhlbi.nih.gov/>]

## Other Languages

Find health information in languages other than English [<https://medlineplus.gov/languages/hearthealthtests.html>] on *Heart Health Tests*

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