**Cardiovascular Disease Diagnosis**

* [Download PDF Copy](https://www.news-medical.net/health/Cardiovascular-Disease-Diagnosis.aspx)

By [Dr. Ananya Mandal, MD](https://www.news-medical.net/medical/authors/ananya-mandal)*Reviewed by*[*April Cashin-Garbutt, MA (Editor)*](https://www.news-medical.net/medical/authors/april-cashin-garbutt)

Cardiovascular diseases are diagnosed using an array of laboratory tests and imaging studies. The primary part of diagnosis is medical and family histories of the patient, risk factors, physical examination and coordination of these findings with the results from tests and procedures.

Some of the common tests used to diagnose cardiovascular diseases include:

**Blood Tests**

Laboratory tests are used to detect the risk factors for heart diseases. These include detection of the fats, cholesterol and lipid components of blood including LDL, HDL, Triglycerides.

Blood sugar and Glycosylated hemoglobin is measured for detection of diabetes. C-reactive protein (CRP) and other protein markers like Apolipoprotein A1 and B are used to detect inflammation that may lead to heart diseases.

During a heart attack, heart muscle cells die and release proteins into the bloodstream. Blood tests can measure the amount of these proteins in the bloodstream. High levels of these proteins are a sign of a recent heart attack.

One of the markers of heart attack is the Cardiac Troponin-T. Other biomarkers include fibrinogen and PAI-1, high levels of homocysteine, elevated asymmetric dimethylarginine and elevated brain natriuretic peptide (also known as B-type) (BNP)

**EKG/ECG  (Electrocardiogram)**

This is a simple and a painless test that records the heart’s electrical activity. The patient is strapped to the instrument with several patches or leads placed over his or her chest, wrists and ankles. A small portable machine records the activities of the heart on a strip of graph paper.

The test shows how fast the heart is beating and its rhythm. The strength and timing of the electrical signals as they pass through the heart are also seen. An EKG/ECG can help detect a heart attack, attacks of angina, arrhythmias etc.

**Stress Testing**

**Related Stories**

* [Researchers find new insight on the link between a gene and congenital heart disease](https://www.news-medical.net/news/20210608/Researchers-find-new-insight-on-the-link-between-a-gene-and-congenital-heart-disease.aspx)
* [Exercise may be the most effective treatment for depression in coronary heart disease patients](https://www.news-medical.net/news/20210608/Exercise-may-be-the-most-effective-treatment-for-depression-in-coronary-heart-disease-patients.aspx)
* [Novel computer system can help inform future therapies for patients with inherited heart disease](https://www.news-medical.net/news/20210614/Novel-computer-system-can-help-inform-future-therapies-for-patients-with-inherited-heart-disease.aspx)

For this test, the patient is made to work hard e.g. run on a treadmill or exercise while the leads of EKG/ECG are placed over their body. Those who cannot exercise are given pills to raise their heart rate. The test detects the effects of the exercise on the heart.

In patients with atheroisclerosis and coronary heart diseases the arteries that are narrowed by plaques cannot supply adequate blood to the heart muscles while it is beating faster. This may lead to shortness of breath and chest pain. The EKG/ECG pattern, arrhythmias etc. also show the possibility of a coronary artery disease.

**Echocardiography**

This test uses sound waves to create a moving picture of the heart. This is also a painless test where a probe is rolled over the chest and the machine creates the image of the heart on the monitor. This provides information on the shape, size, workings, valves and chambers of the heart.

Echocardiography may also be combined with Doppler to show the areas of poor blood supply to the heart. It shows the areas of the heart muscle that are not contracting normally, and previous injury to the heart muscle.

**Coronary Angiography and Cardiac Catheterization**

This test is an invasive test. A dye is injected into the veins to reach the coronary arteries. This is done via coronary catheterization. Thereafter detailed pictures of the blood vessels of the heart are taken using special imaging methods. This is called coronary angiography.

Cardiac catheterization involves threading of a thin, flexible tube called a catheter via a blood vessels in the arm, groin (upper thigh), or neck. The tube is inserted under imagin guidance till it reaches the heart. Coronary angiography detects blockages in the large coronary arteries.

**Chest X Ray**

This is a test that shows the shape and size of the heart lungs and major blood vessels. This is a test seldom used in diagnosis of heart diseases as it does not provide added information over echocardiography and other imaging studies.

**Electron-Beam Computed Tomography or EBCT**

EBCT helps to detect the calcium deposits or calcifications in the walls of the coronary arteries. These are early markers of atherosclerosis and coronary heart disease. This is not a routine test in coronary heart disease.

**Cardiac MRI**

Cardiac MRI (magnetic resonance imaging) that uses radio waves, magnets, and a computer to create pictures of the heart. This gives a 3D image of the moving as well as still pictures of the heart.

**2. Heart Attack Symptoms**

* [Download PDF Copy](https://www.news-medical.net/health/Heart-Attack-Symptoms.aspx)

By [Dr. Ananya Mandal, MD](https://www.news-medical.net/medical/authors/ananya-mandal)*Reviewed by*[*Sally Robertson, B.Sc.*](https://www.news-medical.net/medical/authors/sally-robertson)

The onset of heart attack symptoms can be very sudden and require immediate medical attention. An ambulance should be called and critical care services alerted as soon as symptoms appear.

**Related Stories**

* [Researchers find new insight on the link between a gene and congenital heart disease](https://www.news-medical.net/news/20210608/Researchers-find-new-insight-on-the-link-between-a-gene-and-congenital-heart-disease.aspx)
* [BUSM receives $2.7 million grant to reduce disparities in cardio-oncology](https://www.news-medical.net/news/20210629/BUSM-receives-2427-million-grant-to-reduce-disparities-in-cardio-oncology.aspx)
* [Plant-based food can reduce heart disease risk by 10% research shows](https://www.news-medical.net/news/20210527/Plant-based-food-can-reduce-heart-disease-risk-by-1025-research-shows.aspx)

Some of the symptoms of heart attack include:

* Chest pain – There chest may feel heavy and painful, as if it is being compressed. The pain may last for more than a few minutes or it may come and go.
* The pain may not stay confined to the chest and may radiate to the arms (usually the left arm), the neck, jaws, back and abdomen.
* The pain may be mild or severe and is often mistaken for heartburn or indigestion
* Feeling of weakness
* Sweating
* Feeling dizzy or lightheaded
* Shortness of breath, coughing and/or wheezing
* Nausea and vomiting
* An intense feeling of anxiety that is often described as a sinking sensation and sense of impending doom.
* Heart attack can also lead to more serious complications such as arrhythmia or irregularity of the heart rhythm. These are usually atrial arrhythmias that arise from the atrium. Ventricular arrythmias are more serious because they can cause the heart to spasm and stop beating altogether. This is known as sudden cardiac arrest. Some of the symptoms of this condition include:
  + Loss of consciousness
  + Cessation of breathing and movement
  + Nonresponsiveness to sound or touch

If the above symptoms occur, chest compressions need to be started immediately. The rate of compression should be around 100-120 compressions per minute. This is called CPR or cardiopulmonary resuscitation.

**3. Heart Attack Treatment**

* [Download PDF Copy](https://www.news-medical.net/health/Heart-Attack-Treatment.aspx)

By [Dr. Ananya Mandal, MD](https://www.news-medical.net/medical/authors/ananya-mandal)*Reviewed by*[*Sally Robertson, B.Sc.*](https://www.news-medical.net/medical/authors/sally-robertson)

A heart attack is a medical emergency and needs to be diagnosed and treated immediately to increase the chance of a patient surviving. When a patient presents with a heart attack, an ambulance should be called and critical care services alerted as soon as possible.

On admission to hospital, the treatment approach to heart attack depends on several factors. An outline of the steps taken to manage heart attack is given below:

* Ideally, the patient is given an aspirin tablet (300 mg) to chew on and swallow as soon as symptoms develop. At this dose, the aspirin acts as an anti-platelet agent and thins the blood, therefore reducing the risk of heart attack.
* Nitroglycerin may be administered to dilate the arteries in the heart.
* The patient may be given an oxygen mask.
* An electrocardiogram (ECG) is performed either in the ambulance during transit to the hospital or immediately after hospital admission. The ECG is used to detect the occurrence of a heart attack as well as to determine the type and severity of the heart attack. ST segment elevation myocardial infarction or STEMI is the most serious form of heart attack. All other heart attacks are classified as non-ST segment elevation myocardial infarction or NSTEMI.
* The treatment options for a heart attack depend on whether it is a STEMI or an NSTEMI. In the case of STEMI, the patient is assessed for immediate treatment to unblock the coronary artery. The treatment will depend on when the symptoms started and how soon treatment can be performed. **If symptom onset was within the last 12 hours,**primary percutaneous coronary intervention (PCI) is usually advised. In cases where symptom onset was within the last 12 hours but PCI cannot be accessed quickly, medication that breaks down blood clots is offered. Medications that can break down the blood clots are called thrombolytics or fibrinolytics. Examples include reteplase, alteplase and streptokinase.

If the symptoms began more than 12 hours previously, an angiogram will be performed to determine the best treatment course which may include a combination of medication and PCI or coronary bypass surgery.

**Related Stories**

* [BUSM receives $2.7 million grant to reduce disparities in cardio-oncology](https://www.news-medical.net/news/20210629/BUSM-receives-2427-million-grant-to-reduce-disparities-in-cardio-oncology.aspx)
* [Researchers find new insight on the link between a gene and congenital heart disease](https://www.news-medical.net/news/20210608/Researchers-find-new-insight-on-the-link-between-a-gene-and-congenital-heart-disease.aspx)
* [Plant-based food can reduce heart disease risk by 10% research shows](https://www.news-medical.net/news/20210527/Plant-based-food-can-reduce-heart-disease-risk-by-1025-research-shows.aspx)
* PCI is the term used to describe emergency treatment of STEMI using coronary angioplasty. Coronary angiography is usually performed first to assess the patient’s suitability for PCI. This shows the sites and extent of blockage within the coronary arteries.
* Coronary angioplasty is a procedure that is performed to open up the narrowed coronary arteries. Here, a thin tube called a catheter is threaded into the heart via a blood vessel in the arm or groin, under X-ray guidance. It contains a sausage-shaped balloon at the end. Once in position, the balloon is inflated inside the narrowed part of the artery to open it up. It is then replaced by a stent (flexible metal mesh) that will hold the artery open from within after the catheter has been withdrawn.
* When coronary angioplasty is not possible, an alternative surgical procedure called coronary artery bypass graft (CABG) or cardiac bypass surgery is performed. Here, a part of a blood vessel or graft is taken from another body part such as the chest or leg and used to create a bypass between the aorta and the coronary artery above and below the narrowed area or blockage, therefore creating an alternative path for blood flow.
* Examples of medications that may need to be continued after a heart attack has occurred include:
  + Beta blockers such as metoprolol
  + ACE inhibitors such as enalapril and other blood pressure controlling medications
  + Anticoagulants such as aspirin and clopidogrel
  + Statins to control cholesterol levels