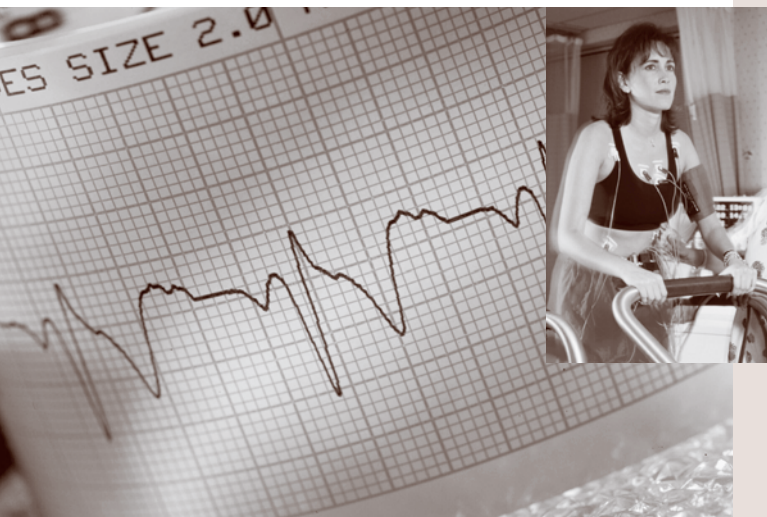


Heart Tests



 Marshfield Clinic
 MINISTRY HEALTH CARE



Two Leaders, One Leading Heart Care Team



Heart Tests

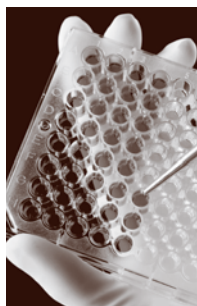
Thanks to advances in technology and medical research, doctors have many options available to help them diagnose and treat disease early.

Several tests are used to diagnose heart disease. Your doctor will decide which tests are most appropriate for you based on several factors, including your risk factors, history of heart problems and current symptoms.

Laboratory Tests

Lipid Profile

This test measures the amount of fatty substances in the blood. These include total cholesterol, HDL (good cholesterol), LDL (bad cholesterol) and triglycerides. High levels of LDL and triglycerides are a risk factor for heart disease. These results, along with other heart risk factors that a person might have, are used to help the doctor determine what treatment is appropriate.



Electrolytes

These substances in the blood help regulate the proper balance of body fluids. Electrolyte levels are useful in detecting kidney, heart and liver disease. They can also show the effects of certain medications such as diuretics or some heart pills.

Cardiac Enzymes

When cells are damaged, enzymes are released into the bloodstream. This test would be performed if your doctor was concerned you may be having or have had a recent heart attack.

Electrocardiograph Tests

Resting Electrocardiogram (EKG or ECG)

While you are lying down, leads or wires attached to sticky pads are placed across your chest in various locations. These are attached to an EKG machine which records the electrical activity or rhythm of your heart from 12 different views. A healthy person's electrocardiogram has a certain pattern. When there are changes in that pattern, information about a variety of heart conditions can be determined.

Holter Monitor/Event Recorders

A Holter monitor or event recorder is a portable EKG recorder that you wear during normal daily activities, including sleep. It can be worn for days or weeks. You will be instructed to keep a diary of your activities and any symptoms such as dizziness, palpitations, shortness of breath or pain that you experience.

Tilt Table Test

This is a test used to determine the cause of fainting spells. It involves being tilted, always with the head up, at different angles for a period of time. Heart rhythm, blood pressure and other indicators are closely monitored and evaluated during position changes.

Echocardiogram



An echocardiogram uses sound waves (ultrasound) to produce images of the heart. The image is produced by moving a sensitive, wand-like device or transducer over the chest area. This common test allows your doctor to see your heart in motion. Your doctor can use these images to identify various abnormalities in the heart muscle and valves.

Transesophageal Echocardiogram (TEE)

This test allows the doctor to view the internal structures of the heart and its major vessels by inserting a probe, or thin flexible tube with a special tip, into the esophagus or “food pipe.” Generally this is used when the images cannot be seen well enough on a traditional echocardiogram. It requires the use of sedation.

Stress Echocardiogram

This combines two tests, an exercise stress test and an echocardiogram (“echo”). A stress echo can accurately visualize the motion of the heart’s walls and pumping action when it isn’t always apparent on other heart tests.



Nuclear Medicine Imaging Tests

Nuclear imaging is a method of producing images by detecting radiation from different parts of the body after a small amount of radioactive material is injected into the bloodstream. The amount of radiation a patient receives in a typical nuclear imaging scan is very low. Nuclear medicine images focus on the functional processes of the body.

Cardiac Viability

A cardiac viability study is performed to see if an area of the heart contains live tissue. For this test, a small amount of radioactive sugar is administered to the patient and images are taken in the PET/CT scanner. The images show what portion of the heart is processing glucose. This test is usually performed after a patient has suffered a heart attack and the physician needs to assess if the patient would benefit from bypass surgery.

Multigated Acquisition Scan (MUGA)

MUGA is a nuclear medicine test to evaluate the function of the heart. It provides a movie-like image of the beating heart and allows the doctor to determine the health of its major pumping chambers.

Positron Emission Tomography (PET scan)

This test creates three-dimensional images of the tissues in the body and can monitor metabolic processes.

Stress Tests

Individuals with coronary artery disease may experience very few symptoms and have a normal EKG at rest. Once the heart is “stressed,” where oxygen requirements are increased, evidence of heart disease may be revealed.

Exercise Stress Test



This test can show if the blood supply to the heart is reduced and also can determine the type and level of exercise appropriate for an individual. It usually involves walking on a treadmill at increasing levels of difficulty. With increased exertion, your heart works harder to pump more blood so as to supply the body with the added oxygen

needed. Heart rhythm, blood pressure and other indicators are closely monitored and evaluated to determine how the heart responds to exercise.

Non-Exercise Stress Test

This test is used in people who are not able to exercise. A drug (dobutamine, adenosine or persantine) is given to make the heart behave as if the person were exercising. This way the doctor can determine how the heart responds to stress without the need for physical activity.

Rubidium (Rb-82) Stress Test

This nuclear medicine test is used to evaluate coronary artery disease. A radioactive material is injected into the patient and absorbed by their heart. Images taken before and after medically stressing the heart allow a clear view of how the heart and coronary arteries react to stress. This test is easy on the patient and can be completed in just one hour.

Sestamibi Stress Test

This nuclear medicine test is used to evaluate coronary artery disease. A radioactive material is administered to the patient and resting images are taken. Images are taken before and after stressing the heart by treadmill exercise or medication and allow a clear view of how the heart and coronary arteries react to stress. The imaging test is completed in four to five hours.



Radiographic Tests

Radiographic tests are non-invasive tests which use X-ray machines or specialized equipment with computer technology to create pictures of the internal structures of the body.

Chest X-ray

A very small amount of radiation is used to produce an image on film of the structures of the chest, heart, lungs and bones. It can show the size of your heart as well as the condition of your lungs.



Other

Though not routine, your doctor may order other radiographic tests such as :

- **Cardiac Magnetic Resonance Imaging (MRI)**
- **Cardiac Computed Tomography (CT) Scan**
- **Cardiac Computed Tomography Angiography (CCTA) Scan**

This scan, using one of only fifty 128-slice scanners of its kind in the country, produces the clearest pictures yet of a beating heart. It provides at least twice the resolution of any other scanner in the region, in half the time and with half the radiation exposure. Additionally, it can be used for patients with elevated heart rates and larger patients.



Invasive Tests

Cardiac Catheterization

This test is one of the most accurate and useful tools in diagnosing cardiovascular problems.

A thin, flexible tube (catheter) is inserted into an artery in your groin (sometimes arm) and then threaded to the

heart. Contrast dye is injected through the catheter, then X-ray pictures are taken. This test can be used to determine pressure and blood flow in the heart's chambers, collect blood samples, examine the coronary arteries, the aorta, the heart valves and observe the function of the heart muscle. A technique called fluoroscopy provides "real time" viewing of the images as well as a permanent record of the procedure. The physician can evaluate and determine the need for further treatment such as angioplasty or bypass surgery.



Electrophysiologic Test

This test "maps" the spread of electrical impulses through the heart. Catheters tipped with electrodes are threaded through blood vessels to different locations in the heart. The heart can be stimulated to beat rapidly to help determine if abnormal rhythms develop and the area in which these irritable sites are located. This test gives a more detailed analysis than a basic electrocardiogram.

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