

# STRESS TEST FOR THE HEART

Stress tests are a reliable way to determine heart conditions.



Chest pains can be indicative of a heart problem. However, not all chest pain or breathlessness is due to a heart condition. In order to find out if it is, the heart has to be stressed.

Under strenuous condition, oxygen requirement is increased, thus more blood has to flow through the arteries. A blocked artery will not be able to handle increased blood flow. To enable doctors to detect the presence of this blocked artery, the patient has to be stressed physically. This is done with a treadmill. The patient will have ECG (electrocardiogram) leads attached to his body as he walks on the treadmill to monitor any changes in ECG. There will be very specific changes in the ECG when the heart experiences lack of oxygen (ischaemia). Blood pressure, heart rate, and ECG readings are monitored during the stress test.

An ECG reading taken while the patient is at rest will not be able to pick up if there are any blocked arteries in the heart, although it can detect a lot of conditions such as past heart attack or an on-going heart attack. It often will appear normal even in the presence of severely blocked arteries. This is because at rest, the heart does not need much oxygen.

## EXERCISE STRESS ECHO

However, an ordinary treadmill stress test, which relies only on ECG changes to pick up blocked arteries, is only about 70% accurate. This means there will be false positive or false negatives results.

An ultrasound scan of the heart is called echocardiogram. It will see the resting function of the heart including muscles and valves. A stress echocardiogram which incorporates the use of an ultrasound machine together with ECG is about 85% accurate.

In a stress echo test, the patient will first have his heart scanned at rest. He will then be put through the treadmill to stress the heart. At peak stress, the heart is immediately scanned again. Therefore, two images of the heart - at rest and at peak stress - will be taken.

These two images are then compared side by side. In this way, any areas that do not contract adequately at peak stress will be detected. Because there is direct vision of the heart rather than relying just on ECG, this is therefore more accurate in determining the heart condition.

## SUITABLE CANDIDATES

A stress test can be done for two broad categories of patients. One is for screening, which is usually done on people without any symptoms. Its function is to find out if there is anything wrong with the normal functioning of the heart before symptoms appear. The other group consists of people with symptoms. This is to sort out if the symptoms are due to the heart.

How should a patient be prepared for such a test? The patient should come prepared to do some exercise. Therefore, avoid having a full meal just before the test. This will make running uncomfortable. In addition, the patient should wear exercise shoes and shorts. Since this is a test to find out if there are any problems, there is no need for patient to train for it prior to the test. The treadmill is calibrated to become more steep and to roll faster every three minutes. How long a person can walk on it is determined by how fit a person is or how severely blocked the arteries are.

Anyone who is unable to walk is best suited for other form of stress. Examples are usually those who have had a stroke, leg injuries or amputees. These people may be stressed by pharmacological means where medicine is slowly dripped into the veins (via a needle) that will gradually increase heart beat rate and pressure. The patient's heart will be scanned for telltale signs during this time. The accuracy is the same as exercise stress echo.

