

Great Lakes Heart Center of Alpena Patient Education Handout

STRESS TESTING

The heart produces minute amounts of electricity that can be picked up using small electrodes placed over the skin and recorded to produce an electrocardiogram, also referred to as an EKG or ECG. This electrical pattern can be affected by a number of conditions. During an exercise electrocardiogram (also referred to as stress test) a patient's electrocardiogram is recorded before, during and immediately after exercise to evaluate the heart's response to physical activity.

When your heart is relaxed it may get enough blood even in the presence of obstructed coronary arteries. However, during physical activity the heart rate and contractility (or strength of contraction) increases, requiring more blood and oxygen than these narrowed arteries are able to supply.

A reduction in blood flow to part of the heart may produce characteristic abnormalities on the electrocardiogram. However these abnormalities are not often seen on an ECG taken at rest, but can be made to appear during exercise.

During exercise stress testing, the exercise is performed by walking on a treadmill or pedaling a stationary bicycle. The treadmill's speed and incline, or the bicycle's resistance to pedaling, are then progressively increased over time.

Why It Is Done

An exercise electrocardiogram is done:

- To evaluate whether complaints of chest pain is due to coronary artery disease (CAD),
- To determine an individual's ability to tolerate exercise or start an exercise program,
- To identify abnormal heart rhythms that can be triggered by exercise,
- To detect coronary artery disease in a person without symptoms, but has risk factors for CAD, such as smoking, high cholesterol, high blood pressure, diabetes or a family history,
- To determine whether blockage of an artery has recurred or coronary artery disease has progressed, especially in patients who previously undergone angioplasty or coronary artery bypass surgery,
- To evaluate the effectiveness of medical therapy for arrhythmias, angina or known CAD,
- To determine whether an obstruction of moderate severity that was demonstrated on coronary angiography can cause ischemia.

How is the Procedure Performed

- The patient's history is reviewed in detail to determine if there are conditions that could make stress testing risky,
- The patient is then hooked up to equipment to monitor the heart and blood pressure, and record the ECG,
- The patient then walks slowly on a treadmill. When using a stationary bicycle, the patient is made to pedal at a set rate,
- The treadmill speed is then increased to produce the effect of going up a small hill. With a stationary bicycle, the resistance to pedaling is gradually increased while the patient pedals at a set rate,
- At each stage the patient's heart rate, blood pressure and ECG are recorded,

- Symptoms experienced during exercise are also recorded,
- The patient is encouraged to continue exercising to the point of fatigue, but can stop the test at any time,
- The test can also be stopped if the patient develops significant symptoms, ECG abnormalities or severe blood pressure abnormalities,
- Afterwards the patient may sit or lie down and have their heart and blood pressure checked,
- In patient who develop symptoms or ECG abnormalities, monitoring is continued until these resolve.

Stress testing may be dangerous under the following circumstances:

- A recent or ongoing heart attack,
- Unstable angina,
- Uncontrolled or untreated arrhythmias,
- Uncontrolled high blood pressure,
- Severe aortic valve stenosis,
- Active myocarditis (an infection of the heart muscle), or endocarditis (an infection of the heart valves),
- Have severe anemia.
- If you have joint problems that limit your physical exercise.

How to prepare

- Do not eat or drink for at least 4 hours before a stress scan.
- Avoid alcohol, tobacco, caffeinated beverages, and nonprescription medicines for at least 24 hours before the test.
- Drugs for erectile dysfunction such as Viagra must be stopped within the previous 48 hours.
- Ask your doctor whether you need to stop taking any of your other medicines before the test.
- Wear comfortable shoes and loose shorts or pants suitable for exercise.
- Remove all jewelry before the test.
- Talk to your doctor about any concerns you have regarding the need for the test, its risks, how it will be done, or what the results may indicate.
- Inform the doctor, nurse or technician if you are allergic to any medicines or anesthetics.
- Inform the doctor, nurse or technician if you are or might be pregnant.
- Inform the doctor, nurse or technician if you are breast-feeding. Use formula and throw out your breast milk for 1 to 2 days after the scan.
- Inform the doctor, nurse or technician of any joint problems that may limit your ability to exercise.

Risks

- Emergency equipment and a personnel trained in resuscitation are on hand,
- Though the risks are minimal, the following may occur: severe chest pain (angina), abnormal heart rhythms, or a heart attack.

