

Great Lakes Heart Center of Alpena

Patient Education Handout

PHARMACOLOGIC STRESS TESTING

Some patients who require stress testing are unable to exercise adequately due to back pain, lung disease, joint disease or an unsteady gait. In these situations, a pharmacologic or chemical stress test can be performed. Pharmacologic stress testing is always performed in conjunction with an imaging test such as echocardiography or nuclear perfusion imaging.

HOW IT IS DONE

The test is administered by a doctor and technologist trained in nuclear cardiology or echocardiography. The scanning itself is painless except for stinging or burning sensation discomfort when a needle is inserted into the vein. Lying still for an extended period of time on the table during the scans may also be uncomfortable.

In addition, possible symptoms from the administered drug include:

- dizziness
- headache
- low blood pressure
- shortness of breath
- flushing
- nausea
- chest pain
- EKG changes
- palpitations
- abnormal heart rhythms or arrhythmias

RESTING SCAN

- Wear loose clothing.
- Four electrodes are attached to track your heart.
- The patient then lies on a table while a camera (also called a detector) is positioned over the chest.
- The patient has to remain very still during each scan. The camera moves to take more pictures at different angles.
- The entire test takes 30 to 40 minutes, after which you can resume your normal activities.
- In most cases, the resting images are taken first.

STRESS SCAN

- Additional electrodes are attached in order to continuously monitor your ECG during exercise.
- Currently there are three drugs that are used to perform pharmacologic stress testing.
- Adenosine is a naturally occurring substance found throughout the body that helps regulate blood flow. Given intravenously adenosine dilates the coronary arteries and increases coronary blood flow. Adenosine's ability to produce vasodilatation however is reduced or abolished in diseased or obstructed arteries. It is the resulting regional flow discrepancy that is detected by perfusion imaging.

- For pharmacologic stress testing adenosine is infused over 4 or 6 minutes. Halfway through the infusion the tracer is injected.
- In certain situations patients may be asked to perform low level exercise on a treadmill during the adenosine infusion. This limits the drugs side effects and may improve the quality of the images.
- Dipyridamole (Persantine) is an indirect dilator of the coronary arteries. This drug prevents the breakdown and metabolism of adenosine thereby increasing its levels.
- For pharmacologic stress testing dipyridamole is infused over 4 minutes. Two to four minutes after the end of the infusion the tracer is injected.
- In certain situations patients may be asked to perform low level exercise on a treadmill right after dipyridamole infusion. This limits the drugs side effects and may improve the quality of the images.
- Dobutamine is a catecholamine type drug like epinephrine. When infused, dobutamine increases myocardial blood flow, heart rate and systolic blood pressure similar to that of exercise.
- For pharmacologic stress testing dobutamine is infused at a dose of 10 mcg/kg/minute for 3 minutes. The dose is then progressively increased in increments of 10 mcg/kg to a maximum of 40 mcg/kg/minute. If the target heart rate is not achieved up to 2 mg of atropine may also be administered. The tracer is injected once target heart rate is reached.
- Exercise is performed on a treadmill (more commonly) or on a stationary bicycle.
- The patient is then given time to recover.
- All but four electrodes are removed and used to track your heartbeats.
- The post exercise images are obtained after 30 minutes to 4 hours after exercise cessation.
- The patient is encouraged to eat or drink before being scanned again.

PHARMACOLOGIC 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),
- Severe asthma or underlying lung disease
- 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, theophylline containing medications 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 clothing.
- 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.

A. Salacata, M.D., FACC