Learn More About Cardiac Tests

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If your doctor has indicated you have medical issues that may affect your heart, you may be sent to have a cardiac test to determine the exact nature of the problem. Below are some of the tests conducted by cardiologists and their associates.

**EKG:** A measurement of the electrical conduction of the heart. They are looking to find normal sinus rhythm. If you have complaints of chest pain or having a heart attack you may have some changes in your EKG. If you have complaints of palpitations, your provider may order an EKG. This test is done by attaching electrodes to your chest, arms and legs. It does not cause any pain but does require you to lie still for about one minute. A printout of your electrical conduction will be available right away.

**ETT:** Exercise Tolerance Test: This test is done to measure your exercise capacity and assess any EKG changes. It can also be used to assess heart rate and blood pressure response to exercise. For this test, you are hooked up to EKG electrodes and asked to walk on a treadmill for a period of time. This time is determined by your resting heart rate, blood pressure and age. The technician will also periodically take your blood pressure. Based on this test, further testing may be required to assess for any ongoing coronary disease. For females, stress tests that incorporate imaging may be more appropriate as there are more false positives with just the ETT.

**ESE:** Exercise Stress Echo: This test, like the ETT, has you exercise on a treadmill with EKG leads and periodic BP; however, it also incorporates an echocardiogram. A baseline ultrasound of your heart is taken to assess any gross abnormalities. Then a patient is asked to exercise on the treadmill. Immediately post exercise another echocardiogram is done to assess any heart wall motion abnormalities. This test is used to predict coronary disease. If EKG changes and wall motion abnormalities are detected, then this test is considered positive. The recommendation would be to have a left heart catheterization or angiogram.
**DSE: Dobutamine Stress Echo:** This chemical stress test is used for people who are unable to exercise for any reason. The procedure is the same as the ESE except instead of exercise you receive an infusion of dobutamine which helps your heart beat harder and faster, like exercise would. A positive result in this test would also warrant a left heart catheterization.

**TTE: Trans Thoracic Echocardiogram:** This test is used for many reasons, as it gives a lot of information. It is an ultrasound of your heart that gives specific dimensions and measurements of your heart. It looks at all four chambers of the heart, four valves and part of the aorta, if visible. This test can be used to assess a person’s heart function or ejection fraction. This is testing your heart’s (particularly the left side) ability to pump blood. It can be used to assess a patient’s heart valves. There are numerous reasons why this test may be ordered. This test requires you to lie on a stretcher with a gown open to the front. An ultrasound probe with gel will be moved across your chest. You may be asked to lie to your left side and raise your left arm above your head for better views.

**TEE:** Trans-esophageal echocardiogram can be used if the echocardiogram did not have good views (i.e., a person’s body size and shape may hinder the view) or if you need more detailed images. During this test you will be sedated as the ultrasound probe is moved through your esophagus. This allows for a closer view of the heart. This test is also sometimes used when looking for a thrombus (clot) in your heart chamber or for better assessment of your heart valves. This test is run by a cardiologist.

**Holter Monitor:** This test is used if there are any abnormalities in your EKG or if you have complaints of palpitations. This is somewhat like a walking EKG, without as many electrical views that a 12 lead EKG gives. Your provider may order this test for 24 or 48 hours. This is a small device (about the size of an iPhone) that you can either wear in your pocket or around your neck. It has electrical leads like the EKG in the clinic. When this test is ordered, the nurse will come in and prep your skin. For males this means shaving hair (if necessary) and cleaning with alcohol. For females this means just cleaning with alcohol. Before the nurse attaches the electrodes she will gently abrade the skin with little pieces of Scotch Brite. Please let the nurse know if you have any allergies or sensitivities, especially to soaps or tape. She will then tape the electrodes securely to your chest. She will teach you how to use the device if you have any symptoms such as dizziness or palpitations. After the set amount of time, you return the device and then the information is uploaded and read by a technician and a cardiologist.

**Event Monitor:** An event monitor is a long term arrhythmia monitor. It is put on just like a Holter (the actual device is a little smaller and lighter), but your heart rhythm information is sent by a cell phone that you also receive. If you are having an actual ‘event,’ there is someone watching your rhythm in real time. You will get a call and be asked to go to the ER or given other instructions.
**Chemical MPI:** Adenosine, Dobutamine, Lexiscan: This is a chemical nuclear stress test. Your provider may order this test to assess if your coronary (heart) arteries have any blockages. This test is for people who cannot walk and may have poor views on ultrasound (i.e., echocardiogram or ESE is technically difficult). A positive result on this test would result in a recommendation of left heart catheterization or sometimes just medical management based on severity. When you arrive for this test you will fill out a questionnaire, then the technologist will insert an IV. She will draw blood and mix it with a radioactive tracer. This is then injected back into you through your IV. You will take resting pictures (your heart at rest) and then stress pictures. The stress pictures are done after you have an infusion of either dobutamine or adenosine that will mimic your heart’s reaction at stress.

**Exercise MPI:** This is a nuclear stress test but instead of receiving adenosine or dobutamine, you exercise on the treadmill. Again, same sets of pictures are taken. Based on these results, a left heart catheterization or medical management would be recommended.

**Muga:** This test is used to assess a person’s ejection fraction. Sometimes this test is used prior to chemotherapy in patients about to receive drugs that are particularly cardiotoxic. They will also have this done during and after treatments to assess the effects on the heart. It may be done to corroborate an ejection found by echo on a patient with severe congestive heart failure that may or may not be a candidate for a defibrillator. This is a nuclear test which means that you will be getting radioactive tracers. This is so the camera can pick up the pictures of your heart. Before the test starts, you will receive a IV. A few milliliters of blood will be drawn and mixed with the radioactive tracer. This is then injected back into you through your IV. There will be three sets of pictures taken of your heart for three different views. Based on the pictures, a number is calculated as your EF.

**Left Heart Catheterization or Angiogram:** This is the gold standard in knowing if the vessels in your heart have any blockage. This is an invasive procedure. If you had a stress test that was positive or went to the ER and was found to have EKG changes and elevated cardiac enzymes (blood tests that become elevated when a person is having a heart attack), the provider may recommend a left heart catheterization. This test allows the cardiologists to angiographically visualize, with dye and fluoroscopy (continuous X-ray images), the vessels of your heart. There are three major vessels, left anterior descending (LAD), right coronary artery (RCA) and Left circumflex. When you arrive you will have an IV placed, labs drawn and an EKG done. They will then take you to the catheterization room where they will transfer you to the catheterization table. They will ‘prep’ your groin area or, sometimes, wrist. They shave, clean and sterilize with alcohol and betadine. Please notify the staff of any allergies (i.e., iodine or shellfish). They will put a drape over you, only exposing both prepped groins. The nurse will give you medicine in your IV to make you sleepy and something for pain. The cardiologist will feel for your pulse and then inject lidocaine in that area to make it numb. Then he will make a small incision and place a sheath in your femoral artery. He will insert different catheters through this
sheath to look at different areas of your heart. You will also see a camera moving over your chest taking different views of your heart. If you need a stent or angioplasty, it will usually also be done at this time. If no intervention is needed, the sheath will be removed and you will feel someone placing strong pressure over that area to prevent bleeding. You will be asked to lay flat for about three to four hours. After this, you will be discharged. You must notify your provider or go to the ER if you have any numbness or tingling in the leg that was used. If you have a new hematoma (blood pocket) and/or had one and it seems to be growing, please go to the ER. You will be asked not to lift anything heavier than a gallon of milk for two weeks post angiogram to prevent the incision from opening up again.