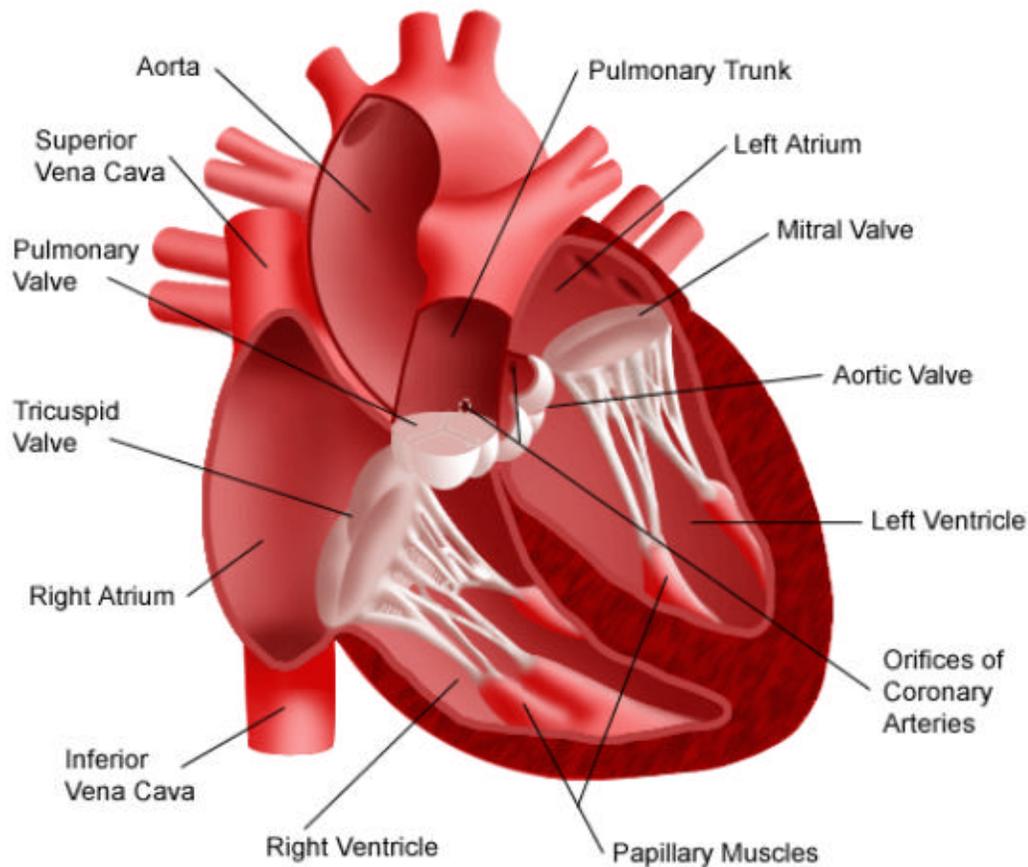


Echocardiography (Echo)

What is an echocardiogram?

An echocardiogram (also called echo, transthoracic echocardiogram or TTE, exercise or stress echocardiogram, dobutamine stress echocardiogram or DSE, or transesophageal echocardiogram or TEE) is a noninvasive (the skin is not pierced) procedure used to assess the heart's function and structures. A transducer (like a microphone) sends out ultrasonic sound waves at a frequency too high to be heard. When the transducer is placed on your chest at certain locations and angles, the ultrasonic sound waves move through the skin and other body tissues to the heart tissues, where the waves echo off of the heart structures. The transducer picks up the reflected waves and sends them to a computer. The computer interprets the echoes into images of the heart walls and valves.

Interior View of the Heart



Why is an echo done?

There are several diseases of the heart that may be detected by echocardiography, including the following:

- atherosclerosis (coronary artery disease) - a blocking of the arteries by fatty material and other substances in the blood stream.
- aneurysm - a dilation of a part of the heart muscle or the aorta (the large artery which carries oxygenated blood out of the heart to the rest of the body) which may cause a weakness of the tissue at the site of the aneurysm. In extreme cases, the aneurysm may rupture, which is an emergency situation, due to rapid blood loss out of the blood vessels. Occasionally an aneurysm may occur in the pulmonary arteries or surgical patch areas especially if any intervention such as balloon angioplasty, has been done.
- cardiomyopathy - an enlargement of the heart, due to thickening or weakening of the heart muscle.
- heart failure - a condition in which the heart muscle has become weakened to an extent that blood cannot be pumped efficiently, thus causing buildup (congestion) in the lung circulation and blood vessels of the abdomen, legs, ankles, and feet and other parts of the body.
- pericarditis - an inflammation of the sac (thin covering) that surrounds the heart.
- valvular heart disease - one or more of the heart's four valves becomes defective, or may be congenitally malformed.

An echocardiogram may be done to further evaluate signs or symptoms of these conditions.

How is an echocardiogram done?

Once all the images have been taken, the technician will wipe the gel from your chest, remove the EKG electrode pads, and assist you to dress, if necessary. Once the procedure has been completed, you will be able to leave and return to your previous activities, unless your physician instructs you differently. The procedure usually takes about 30-45 minutes to perform. However, factors such as schedule delays, emergencies, and other factors may delay the start of your procedure or prolong the length of it.

Exercise (stress) Echocardiogram

The initial portion of an exercise echo is similar to the basic echo procedure described above. After the resting echo images have been obtained, you will begin to exercise on a treadmill or stationary bicycle. You will exercise until a target heart rate (determined by the physician based on your age and physical condition) has been reached, or until you are unable to continue exercising due to chest pain, leg pain, dizziness, severe shortness of breath, or severe fatigue.

Once the target heart rate has been reached, you will continue to exercise for a minute or so more. Then you will lie down on the table or bed and the echo procedure will be repeated. The physician will compare the resting echo with the one done immediately after exercise. Once all the images have been taken, the technician will wipe the gel from your chest, remove the EKG electrode pads, and assist you to dress, if necessary.

Once the procedure has been completed, you will be able to leave and return to your previous activities, unless your physician instructs you differently. The procedure usually takes about 45 minutes to an hour to perform. However, factors such as schedule delays, emergencies, and other factors may delay the start of your procedure or prolong the length of it.

Transesophageal Echocardiography (TEE)

Transesophageal echocardiography is done by inserting a probe down your throat (esophagus) to the level of the heart. The TEE transducer works the same as the transducer used for the other procedures. However, a clearer image can be obtained, because the sound waves do not have to pass through skin, muscle, or bone tissue. Certain conditions of the heart, such as mitral valve disease, blood clots or masses inside the left atrium, dissection (tear) of the lining of the aorta (the artery which carries oxygenated blood from the heart to the body), and implanted prosthetic (artificial) heart valves are better visualized and assessed with TEE.

TEE may also be used during surgery to assess the cardiac status of patients with known cardiac disease who are undergoing noncardiac procedures, and during heart surgery to evaluate the effects of surgical intervention to the heart, such as bypass surgery or valve repair or replacement.

For a TEE procedure, you are taken to a special area with echocardiography and EKG equipment. You will undress from the waist up, and EKG pads will be attached to your chest. You will be given a gown to wear. You will lie on a table or bed for the procedure. An intravenous (IV) line is placed in your hand or arm, so that sedative medication can be given. Sedatives are given to help you relax, but you will remain awake enough to assist in the procedure by swallowing as the TEE probe is passed down your throat. A numbing medication will be sprayed in the back of your throat to make passage of the TEE probe more comfortable. If you have an artificial heart valve, certain congenital conditions, or a history of endocarditis (infection of heart valves), you may be given a dose of IV antibiotics an hour or so prior to the procedure. The echo images are obtained from various angles, as the physician can position the TEE probe remotely. Once all the necessary images have been obtained, the TEE probe will be removed from your throat. You will continue to be monitored in a recovery area until your gag reflex returns and you can swallow adequately enough to take fluids without choking and until you are alert enough to leave. Your heart rate, EKG, blood pressure, and breathing rate will be monitored. Your oxygen level may also be monitored by a probe placed on the tip of a finger or ear lobe. You will need to make arrangements for someone to drive you home after the procedure, as you will not be allowed to drive after having IV sedation.

A TEE usually takes about 2 hours to perform. However, the length of the procedure can be affected by factors such as schedule delays, emergencies, and other factors which may delay the start of your procedure or prolong the length of it.