

# Echocardiography

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## Purpose of Procedure

Echocardiography is performed when heart disease is suspected or chest radiographs (x-rays) show that the heart is enlarged. The echocardiogram (echo) shows the size of the heart chambers and how well the left side of the heart is functioning. It shows whether the heart valves are normal or thickened. An echo can detect the presence of extra fluid in the pericardial sac around the heart and sometimes the presence of tumors in the heart that are causing the extra fluid.

## Description of Technique

Echocardiography is a type of ultrasound examination. All types of ultrasounds bounce sound waves off an object and record the returning sound waves. Special probes are placed on the animal's chest. These probes send and receive the sound waves or echoes. The echo machine converts these sound waves into images of the heart.

It takes special training and months of experience to become proficient in performing echocardiograms. Echo machines are expensive, so they are not available in all veterinary practices. Your pet may be referred to a specialist, such as a veterinary cardiologist, radiologist, or internist, for this procedure.

Several types of echocardiography exist and may be performed in sequence. Two-dimensional (2D) echocardiography shows the heart as it is moving, as well as the inner chambers and outer walls of the heart. Echo in 2D allows gross (major) abnormalities to be detected and identifies areas of the heart to be examined more closely. Tumors, extra fluid in the pericardial sac, and clots in the heart can be found with this technique. Abnormal heart rhythms (arrhythmia) can be identified, and most echo machines have built-in electrocardiographic capability, so the arrhythmia can be examined or recorded during the echo procedure.

Once the heart has been examined with 2D echo, an area is selected for examination with M-mode echo. This form of echocardiography is used to measure the chambers of the heart and to determine how well the left heart is functioning. Because M mode freezes the motion of the heart, it makes measuring the different areas easier. M-mode measurements must be done properly, because inaccurate measurements can underestimate or overestimate problems.

Doppler echocardiography uses color to map the blood flow in the heart. Doppler echo is used to determine whether the blood flow is too fast in certain areas, such as with subaortic stenosis or pulmonic stenosis (congenital heart defects that cause narrowing of the openings that blood flows through). Doppler echo can determine the severity of the defect by measuring the velocity of blood flowing through these narrowed areas. Doppler echo also can detect holes in the wall of the heart, such as occur with ventricular and atrial septal defects. Doppler echo can also detect leakage of the heart valves.

Three-dimensional (3D) echocardiography is available on some echo machines. It gives an accurate image of the heart but currently is used mainly for teaching purposes.

## **Preparation of Animal**

Little preparation is needed for an echo examination. A few animals need to be tranquilized, but most do not. Aggressive cats that cannot be handled easily when awake may require general anesthesia or sedation to perform this procedure. It is best not to feed your animal on the morning of the procedure, just in case sedatives are needed.

In order to get the best possible contact between the echo transducer and the skin, the hair is usually shaved on both sides of the chest. Animals with thin hair coats may not be clipped, but if the hair is not clipped, the quality of the echo image may not be sufficient to make a diagnosis.

Most animals are required to lie on their sides for this procedure. More experienced ultrasonographers may perform the examination with the animal standing or sitting up. The procedure is done in a quiet room, with a minimal amount of stress to the animal.

## **Potential Complications**

Echocardiography is a very safe procedure with no long-term or short-term side effects. The only potential complications are those that may arise from administration of tranquilizers, sedatives, or general anesthesia. Side effects of these drugs are uncommon.

## Follow-up Care

Repeated echo studies may be required to monitor the progression of your animal's heart disease. The frequency of these examinations and other follow-up visits is based on the underlying heart disease.