

Tests and Procedures

Chest Radiography

- Chest radiography is painless, very safe, and noninvasive, and it can sometimes be performed during an outpatient visit while you wait.
- Chest radiography helps evaluate the size, shape, and position of the heart.
- Chest radiography helps evaluate the lungs for the presence of fluid or other abnormalities.
- Radiography can help your veterinarian diagnose numerous medical conditions involving the heart and lungs.

What Is a Radiograph?

A radiograph (sometimes called an *x-ray*) is a type of photograph that reveals the body's bones and internal organs. The procedure for obtaining a radiograph is called *radiography*. Radiography is a very useful diagnostic tool for veterinarians because it can help obtain information about almost any organ in the body, including the heart, lungs, and abdominal organs, as well as the bones.

How Does Radiography Work?

Traditional radiography machines use very low doses of radiation delivered in a focused beam (an x-ray) that is aimed at a photographic plate containing specialized photographic film. The patient is positioned between the x-ray beam and the photographic plate. When the x-ray beam passes through the patient, an image is created on the specialized film. Structures that are very thick or dense, such as bone, do not allow much of the beam to penetrate and expose the film. These structures look very bright or white on a radiograph. In contrast, structures that are not dense (such as air in the lungs) allow the beam to penetrate more completely and expose the film. As a result, these structures appear relatively dark when the radiograph is viewed. Structures that are of medium density, such as fluid, appear in various shades of gray on the film.

Digital radiograph machines use a very similar principle, but the final image can be much sharper

and can show greater detail than images obtained from traditional radiography machines.

How Is Chest Radiography Performed?

Chest radiography is painless, safe, and completely noninvasive. Your pet will be positioned on the x-ray table, and the width of the chest will be measured. This is necessary so that the intensity of the x-ray beam can be precisely adjusted to capture the most accurate information. Once the measurements are complete, the x-ray tube (which will generate a beam

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of low-level radiation) is aligned over the chest, and a button is pushed on the radiograph machine to take the "photograph." This part of the procedure is very much like taking a photograph with a camera. In most cases, at least two pictures are taken from different angles to create a three-dimensional image of the heart and lungs.

Your veterinarian may recommend that your pet receives sedation before undergoing radiography. Patients that are sedated are much easier to position because they are completely relaxed. Sedation may also be recommended if the patient is in pain.

What Are Chest Radiographs Used For?

Chest radiography may be recommended to investigate a variety of clinical signs, including:

- Coughing
- Excessive panting
- Difficulty breathing
- Lethargy
- Weight loss

Chest radiography can evaluate the size, shape, and position of the heart. Heart enlargement, for example, may indicate heart disease.

Chest radiographs also evaluate the lungs for abnormalities. Normally, the lungs should be filled with air, so they should appear relatively dark on a radiograph. If there is other material in the lungs, such as fluid, blood, or scar tissue, the lungs will appear brighter than normal. Fluid in the lungs may suggest pneumonia, hemorrhage (bleeding), heart disease, or another illness. Other densities in the lungs may suggest a tumor, scar tissue, or other abnormality. Asthma and emphysema can also change the way the lungs appear on radiographs.

Chest radiographs also show the trachea (windpipe) and large airways. Diseases and conditions such as bronchitis and a collapsing trachea can change the appearance of these organs on radiographs. Tumors, depending on their size and position, can also be detected using radiography.

What Are the Benefits and Risks of Chest Radiography?

Radiography has many benefits and very minimal risks. It is very safe, completely painless, and noninvasive. It is available in most veterinary practices and can sometimes be performed during an outpatient visit while you wait. Depending on the type of radiographic study being performed, the procedure may take only a few minutes.

The risks of radiography are minimal. Because the level of radiation exposure needed to perform radiography is very low, even pregnant females and very young pets can undergo radiography. If a pet is very unstable, such as a pet with severe breathing difficulties, the stress of performing radiography may be a concern. In these cases, it may be necessary to stabilize the pet (with oxygen or other therapy) before attempting to perform radiography. In the vast majority of cases, the benefits of performing radiography far outweigh the possible risks. Radiography is a valuable tool for your veterinarian because it can provide critical information about many different illnesses and medical conditions.