What Is a Chest CT Scan?

A chest computed tomography (to-MOG-ra-fee) scan, or chest CT scan, is a painless, noninvasive test. It creates precise pictures of the structures in your chest, such as your lungs. "Noninvasive" means that no surgery is done and no instruments are inserted into your body.

A chest CT scan is a type of x ray. However, a CT scan's pictures show more detail than pictures from a standard chest x ray.

Like other x-ray tests, chest CT scans use a form of energy called ionizing radiation. This energy helps create pictures of the inside of your chest.

Overview

Doctors use chest CT scans to:

- Show the size, shape, and position of your lungs and other structures in your chest.
- Follow up on abnormal findings from standard chest x rays.
- Find the cause of lung symptoms, such as shortness of breath or chest pain.
- Find out whether you have a lung problem, such as a tumor, excess fluid around the lungs, or a pulmonary embolism (a blood clot in the lungs). The test also is used to check for other conditions, such as tuberculosis (tu-ber-kyu-LO-sis), emphysema (em-fi-SE-ma), and pneumonia (nu-MO-ne-ah).

The chest CT scanning machine takes many pictures, called slices, of the lungs and the inside of the chest. A computer processes these pictures; they can be viewed on a screen or printed on film. The computer also can stack the pictures to create a very detailed, three-dimensional (3D) model of organs.

Sometimes, a substance called contrast dye is injected into a vein in your arm for the CT scan. This substance highlights areas in your chest, which helps create clearer images.

Outlook

Chest CT scans have few risks. Because the test uses radiation, there may be a slight risk of cancer. Children are more sensitive to radiation than adults because they're smaller and still growing.

The amount of radiation will vary with the type of CT scan. On average, though, the amount of radiation will not exceed the amount a person is naturally exposed to over 3 years. The benefits of a CT scan should always be weighed against the possible risks.

Rarely, people have allergic reactions to the contrast dye that's sometimes used during chest CT scans. If this happens, medicine is given to relieve the symptoms.

Types of Chest CT Scans

A CT scanner is a large, tunnel-like machine with a hole in the center. During a chest CT scan, you lie on a table as it moves small distances at a time through the hole.

An x-ray beam rotates around your body as you move through the hole. A computer takes data from the x rays and creates a series of pictures, called slices, of the inside of your chest.

Different types of chest CT scans have different diagnostic uses.

High-Resolution Chest CT Scan

High-resolution CT (HRCT) scans provide more than one slice in a single rotation of the x-ray tube. Each slice is very thin and provides a lot of details about the organs and other structures in your chest.

Spiral Chest CT Scan

For this scan, the table moves continuously through the tunnel-like hole as the x-ray tube rotates around you. This allows the x-ray beam to follow a spiral path.

The machine's computer can process the many slices into a very detailed, three-dimensional (3D) picture of the lungs and other structures in the chest.

Other Names for Chest CT Scans

- Lung imaging test
- Computed axial tomography (CAT) scan
- Helical CT scan (another name for spiral CT scan)
Who Needs a Chest CT Scan?

Your doctor may recommend a chest CT scan if you have symptoms of lung problems, such as chest pain or trouble breathing. The scan can help find the cause of the symptoms.

A chest CT scan looks for problems such as tumors, excess fluid around the lungs, and pulmonary embolism (a blood clot in the lungs). The scan also checks for other conditions, such as tuberculosis, emphysema, and pneumonia.

Your doctor may recommend a chest CT scan if a standard chest x ray doesn't help diagnose the problem. The chest CT scan can:

- Provide more detailed pictures of your lungs and other chest structures than a standard chest x ray
- Find the exact location of a tumor or other problem
- Show something that isn't visible on a chest x ray

What To Expect Before a Chest CT Scan

What To Wear

Wear loose-fitting, comfortable clothing for the test. Sometimes the CT scan technician (a person specially trained to do CT scans) may ask you to wear a hospital gown.

You also may want to avoid wearing jewelry and other metal objects. You'll be asked to take off any jewelry, eyeglasses, and metal objects that might interfere with the test.

You may be asked to remove hearing aids and dentures as well. Let the technician know if you have any body piercing on your chest.

Pregnancy and Other Conditions

Tell your doctor whether you're pregnant or may be pregnant. If possible, you should avoid unnecessary radiation exposure during pregnancy. This is because of the concern that radiation may harm the fetus.

You and your doctor will decide whether the benefits of a chest CT scan outweigh the possible risks to the fetus, or whether another test might be better. If you do have the chest CT scan, the technician will take extra steps to reduce the fetus' exposure to radiation.

You also should tell your doctor whether:

- You're taking any medicines
- You have any allergies
- You've recently been ill
- You have any medical conditions (for example, heart disease, asthma, diabetes, kidney disease, or thyroid problems)

These factors or conditions may raise your risk of having a bad reaction to the test.

The CT Scanner

The CT scanner is a large, tunnel-like machine with a hole in the center. You'll lie on a table that goes through the hole.

Tell your doctor if you're afraid of tight or closed spaces. He or she may give you medicine to help you relax. This medicine may make you sleepy, so you'll need to arrange for a ride home after the test.

Contrast Dye

Your doctor may inject a substance called contrast dye into a vein in your arm for the test. You may feel some discomfort when the needle is inserted. As the dye is injected, you also may feel warm and have a metallic taste in your mouth. These feelings last only a few minutes.

The contrast dye highlights areas inside your chest, which helps create clearer pictures.

Your doctor may ask you to not eat or drink for a few hours before the test, especially if contrast dye is part of the test.

Some people are allergic to the contrast dye. If you have allergic symptoms, such as itching or hives, tell the technician or doctor right away. He or she can give you medicine to relieve the symptoms.

The most common type of contrast dye used in CT scans contains iodine. Let your doctor know if you're allergic to iodine.

If you're breastfeeding, ask your doctor how long you should wait after the test before you breastfeed. The contrast dye can be passed to your baby through your breast milk.

You may want to prepare for the test by pumping and saving milk for 24 to 48 hours in advance. You can bottle-feed your baby in the hours after the CT scan.

What To Expect During a Chest CT Scan

A chest CT scan takes about 30 minutes, which includes preparation time. The actual scanning time is much shorter, only a few minutes or less.

The CT scanner is a large, tunnel-like machine that has a hole in the middle. You'll lie on a narrow table that moves through the hole.

While you're inside the scanner, an x-ray tube moves around your body. You'll hear soft buzzing, clicking, or whirring noises as the scanner takes pictures.

The CT scan technician who controls the machine will be in the next room. He or she can see you through a glass window and talk to you through a speaker.

Moving your body can cause the pictures to blur. The technician will ask you to lie still and hold your breath for short periods. This will help make the pictures
The scan itself doesn't hurt, but you may feel anxious if you get nervous in tight or closed spaces. Your doctor may give you medicine to help you relax.

What To Expect After a Chest CT Scan

You usually can return to your normal routine right after a chest CT scan. If you got medicine to help you relax during the CT scan, your doctor will tell you when you can return to your normal routine. The medicine may make you sleepy, so you'll need someone to drive you home.

If contrast dye was used during the test, you may have a bruise where the needle was inserted. Your doctor may give you special instructions, such as drinking plenty of liquids to flush out the contrast dye.

If you're breastfeeding, the contrast dye can be passed to your baby through your breast milk. Ask your doctor how long you should wait after the test before you breastfeed.

You may want to prepare for the test by pumping and saving milk for 24 to 48 hours in advance. You can bottle-feed your baby in the hours after the CT scan.

What Does a Chest CT Scan Show?

A chest CT scan provides detailed pictures of the size, shape, and position of your lungs and other structures in your chest. Doctors use this test to:

- Follow up on abnormal results from standard chest x rays.
- Find the cause of lung symptoms, such as shortness of breath or chest pain.
- Find out whether you have a lung problem, such as a tumor, excess fluid around the lungs, or a pulmonary embolism (a blood clot in the lungs). The test also is used to check for other conditions, such as tuberculosis, emphysema, and pneumonia.

What Are the Risks of a Chest CT Scan?

Radiation

Chest CT scans use radiation. The amount of radiation will vary based on the type of CT scan. On average, though, the amount of radiation will not exceed the amount you're naturally exposed to over 3 years. The radiation from the test is gone from the body within a few days.

Children are more sensitive to radiation because they're smaller than adults and still growing.

Exposure to radiation is associated with a risk of cancer. However, it's not known whether the amount of radiation from a chest CT scan increases your risk of cancer.

You and your doctor will decide whether the benefits of the CT scan outweigh any possible risks. Your doctor also will try to avoid ordering repeated CT scans over a short period.

Allergic Reaction

The contrast dye used in some chest CT scans can cause an allergic reaction, such as hives or trouble breathing. The risk of this happening is slight. If you have an allergic reaction, your doctor can give you medicine to relieve it.

The most common contrast dye used in CT scans contains iodine. Tell your doctor if you're allergic to iodine.

Links to Other Information About Chest CT Scans

NHLBI Resources

- Chest X Ray (Health Topics)

Non-NHLBI Resources

- Thoracic CT (MedlinePlus)

Clinical Trials

- Children and Clinical Studies
- Clinical Trials (Health Topics)
- Current Research (ClinicalTrials.gov)
- NHLBI Clinical Trials
- NIH Clinical Research Trials and You® (National Institutes of Health)
- ResearchMatch® (funded by the National Institutes of Health)