Thoracentesis



Thoracentesis uses imaging guidance and a needle to help diagnose and treat pleural effusions. This is a condition in which the space between the lungs and the inside of the chest wall contains excess fluid. Thoracentesis helps determine the cause of the excess fluid. It also helps ease any shortness of breath or pain by removing the fluid and relieving pressure on the lungs.

Your doctor will instruct you on how to prepare, including any changes to your medication schedule. Tell your doctor if you are pregnant and discuss any recent illnesses, medical conditions, and allergies. List all the medications you take, including herbal supplements and aspirin. You may be advised to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs), or blood thinners several days prior to your procedure. Leave jewelry at home and wear loose, comfortable clothing. You may need to change into a gown for the procedure.

What is a Thoracentesis?

Thoracentesis is a minimally invasive procedure that doctors use to diagnose and treat pleural effusions (http://www.radiologyinfo.org) . This is a condition in which there is excess fluid in the pleural space (http://www.radiologyinfo.org) , also called the pleural cavity. This space exists between the outside of the lungs and the inside of the chest wall.

What are some common uses of the procedure?

Doctors use thoracentesis to:

- relieve pressure on the lungs
- treat symptoms such as shortness of breath and pain
- determine the cause of excess fluid in the pleural space.

How should I prepare?

Prior to your procedure, your doctor may test your blood to check your kidney function and to determine if your blood clots normally.

Tell your doctor about all the medications you take, including herbal supplements. List any allergies, especially to local anesthetic (http://www.radiologyinfo.org) , general anesthesia (http://www.radiologyinfo.org) , or contrast materials (http://www.radiologyinfo.org) . Your doctor may tell you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs (http://www.radiologyinfo.org)) or blood thinners before your procedure.

Tell your doctor about recent illnesses or other medical conditions.

You should tell your physician if you have:

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- bleeding problems or take blood thinners, including aspirin. Be sure to tell your doctor about all the medications you are taking
- had lung surgery
- lung disease, such as emphysema (http://www.radiologyinfo.org) .

Women should always tell their doctor and technologist (http://www.radiologyinfo.org) if they are pregnant. Doctors will not perform many tests during pregnancy to avoid exposing the fetus (http://www.radiologyinfo.org) to radiation. If an x-ray is necessary, the doctor will take precautions to minimize radiation exposure to the baby. *See the Radiation Safety (https://www.radiologyinfo.org/en/info/safety-radiation) page for more information about pregnancy and x-rays.*

You will receive specific instructions on how to prepare, including any changes you need to make to your regular medication schedule.

You may need to remove your clothes and change into a gown for the exam. You may also need to remove jewelry, eyeglasses, and any metal objects or clothing that might interfere with the x-ray images.

If you need sedation, have someone accompany you and drive you home afterward.

What does the equipment look like?

In this procedure, ultrasound (http://www.radiologyinfo.org) , CT (http://www.radiologyinfo.org) , or x-ray (http://www.radiologyinfo.org) equipment may be used to guide a needle into the fluid within the pleural space. Thoracentesis is typically performed with ultrasound guidance. Occasionally, CT-guidance will be used.

Ultrasound machines consist of a computer console, video monitor and an attached transducer (http://www.radiologyinfo.org) . The transducer is a small hand-held device that resembles a microphone. Some exams may use different transducers (with different capabilities) during a single exam. The transducer sends out inaudible, high-frequency sound waves into the body and listens for the returning echoes. The same principles apply to sonar used by boats and submarines.

The technologist applies a small amount of gel to the area under examination and places the transducer there. The gel allows sound waves to travel back and forth between the transducer and the area under examination. The ultrasound image is immediately visible on a video monitor. The computer creates the image based on the loudness (amplitude), pitch (frequency), and time it takes for the ultrasound signal to return to the transducer. It also considers what type of body structure and/or tissue the sound is traveling through.

The CT scanner is typically a large, donut-shaped machine with a short tunnel in the center. You will lie on a narrow table that slides in and out of this short tunnel. Rotating around you, the x-ray tube and electronic x-ray detectors are located opposite each other in a ring, called a gantry. The computer workstation that processes the imaging information is in a separate control room. This is where the technologist operates the scanner and monitors your exam in direct visual contact. The technologist will be able to hear and talk to you using a speaker and microphone.

A thoracentesis needle is generally several inches long and the barrel is about as wide as a large paper clip. The needle is hollow so fluid can be aspirated (drawn by suction) through it. In some instances, a small tube is advanced over the needle, and the fluid is removed through the tube after removing the needle.

How is the procedure performed?

A chest x-ray may be performed before a thoracentesis.

This procedure is often done on an outpatient basis. However, some patients may require admission following the procedure. Ask your doctor if you will need to be admitted.

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The doctor or nurse will position you on the edge of a chair or bed with your head and arms resting on an examining table.

They will sterilize the area of your body where the needle is to be inserted and cover it with a surgical drape.

Your doctor will numb the area with a local anesthetic (http://www.radiologyinfo.org) . This may briefly burn or sting before the area becomes numb.

The doctor inserts the needle through the skin between two ribs on your back. When the needle reaches the pleural space between the chest wall and lung, the doctor removes the pleural fluid (http://www.radiologyinfo.org) through a syringe or suction device.

Thoracentesis usually takes about 15 minutes.

At the end of the procedure, the doctor will remove the needle and apply pressure to stop any bleeding. They will cover the opening in the skin with a dressing. No sutures are necessary.

If necessary, you may have a chest x-ray after thoracentesis to detect any complications.

What will I experience during and after the procedure?

You will feel a slight pinch when the nurse inserts the needle into your vein for the IV line and when they inject the local anesthetic. Most of the sensation is at the skin incision site. The doctor will numb this area using local anesthetic. You may feel pressure when the doctor inserts the catheter into the vein or artery. However, you will not feel serious discomfort.

You will need to remain still during the procedure and not cough or breathe deeply to avoid injury to the lung.

You may feel pressure when the needle is inserted into the pleural space.

When the doctor removes the pleural fluid, you may feel a pulling sensation or pressure in your chest. It is common to have the urge to cough as the fluid is removed and the lung re-expands. Tell your doctor or nurse if you feel faint or if you have any shortness of breath or chest pain.

Who interprets the results and how do I get them?

The interventional radiologist (http://www.radiologyinfo.org) or doctor treating you will determine the results of the procedure. They will send a report to your referring physician, who will share the results with you.

Your interventional radiologist may recommend a follow-up visit.

This visit may include a physical check-up, imaging exam(s), and blood tests. During your follow-up visit, tell your doctor if you have noticed any side effects or changes.

What are the benefits vs. risks?

Benefits

- Thoracentesis is generally a safe procedure.
- No surgical incision is necessary.

Risks

- Any procedure that penetrates the skin carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.

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Complications may include:

- pneumothorax or a partial collapse of the lung caused by air entering the pleural space through the needle or rarely by the needle puncturing the lung allowing air to flow into the pleural space.
- pulmonary edema (http://www.radiologyinfo.org) , which may occur if a large amount of fluid is removed too rapidly.
- infection and bleeding.
- breathing difficulty.

What are the limitations of Thoracentesis?

Patients who have an uncorrectable bleeding disorder (http://www.radiologyinfo.org) may not have thoracentesis.

The accuracy of a thoracentesis may be affected by a patient's:

- use of antibiotics (http://www.radiologyinfo.org) .
- inability to remain still.

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