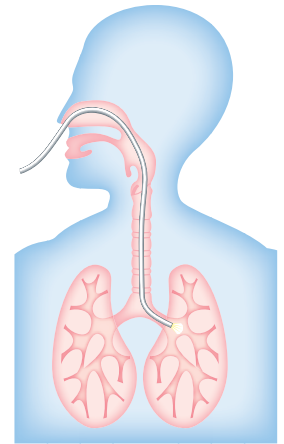


Flexible Bronchoscopy (Airway Endoscopy)

Flexible bronchoscopy (bron-kos'ko-pi) is a visual exam of the breathing passages of the lungs (called "airways"). It is also called airway endoscopy. This test is done when it is important for your doctor to see inside the airways of your lungs, or to get samples of mucus or tissue from the lungs. Bronchoscopy involves placing a thin tube-like instrument called a bronchoscope (bron'ko-sko-p) through the nose or mouth and down into the airways of the lungs. The tube acts as a camera and is able to carry pictures back to a video screen.



Why do I need a bronchoscopy?

Common reasons why a bronchoscopy is needed include:

- **Infections**—When a person is suspected of having a serious infection, bronchoscopy may be performed to get better samples from a particular area of the lung. These samples can be looked at in a lab to try to find out the exact cause of the infection. A person who has recurrent infection may have a bronchoscopy to try to figure out a cause. For example, tissue samples can be looked at for cilia function (brush lining of airways that move mucus). Airway fluid can be checked to see if there are any signs of aspiration due to swallowing problems that allow food or liquids to get into the airways.
- **Lung spot**—An abnormal finding ("spot") in the lung viewed on an x-ray film or CT scan may be caused by an infection, cancer, or inflammation. Bronchoscopy is done in some cases to take samples from the area. These samples are then looked at in a lab to help find the specific cause of the lung spot.
- **Airway blockage and Atelectasis**—Atelectasis is caused when the airway to a lung or part of a lung is blocked and air cannot get through. The air sacs do not expand which can be seen on chest x-ray. This blockage is usually caused by something such as a peanut, a tumor, or thick mucus in the airway passage. Bronchoscopy allows the doctor to see the blockage and try to sample and/or remove the substance. This helps to open up the airway and lung, especially when lesser invasive treatments (like chest airway clearance) have failed.
- **Bleeding**—When a person has coughed up blood, bronchoscopy may help find the cause of the bleeding. For example, if a tumor is causing the bleeding, the doctor will locate the tumor and take samples of tissue (biopsies) through the bronchoscope. The samples are then looked at in the lab to identify the type of tumor.
- **Noisy Breathing and Abnormal Airways**—A person can have noisy or abnormal breathing sounds that may be caused by a problem with the throat or airways of the lung. There may be shortness of breath, noisy breathing, or labored breathing during sleep. Children may be born with abnormal airways such as a tracheal (windpipe) connection with the esophagus (feeding

tube) called a TE fistula. Bronchoscopy allows the doctor to look directly at the throat, vocal cord area, windpipe, and major airways to identify any problems. Causes of this type of breathing may include vocal cord paralysis or weakness, floppiness in the airways (bronchomalacia) or voice box (laryngomalacia), or a blood vessel pressing on the outside of the airway (vascular compression).

- **Lung Transplant**—People who have had lung transplant will have bronchoscopy to check on how well the lungs are doing. Samples will be taken of tissue and airway mucus to check for infection or signs of rejection in the new lungs.

Alternatives to bronchoscopy

Other tests and procedures, such as x-rays, CT scans and suctioning techniques can give the doctor some information about the lungs, but bronchoscopy allows the doctor to look at the inside of the lungs, obtain very specific samples and remove mucus if necessary. This is why your doctor may schedule a bronchoscopy even after you have had X-rays or other tests.

Preparing for a bronchoscopy

In a critically ill patient who has a breathing tube, feedings are stopped hours before the procedure to assure that the stomach is empty. The patient is given a small amount of medicine (a sedative) that causes sleepiness.

If you are having a bronchoscopy as an outpatient or as a non-critically ill inpatient, you will be told not to eat after midnight the night before (or about 8 hours before) the procedure. You will also receive instructions about taking your regular medicines, not smoking and removing any dentures before the procedure.

Right before the procedure, you may be given a medicine to numb your nose and throat area to make it more comfortable and help prevent coughing and gagging during the procedure. After that, you may be given a sedative by IV (in your vein). The sedative will help you to relax, and may make you sleepy. The sedative may also help you to forget any unpleasant sensations felt during the test.

What happens during a bronchoscopy?

Your doctor can explain what will happen during the

PHYSICIANS:
CLIP
AND
COPY

bronchoscopy. If you are awake, he or she can talk you through it step-by-step. You will probably be lying down with the head of the bed tilted up slightly. The bronchoscope is placed through your nose, then advanced slowly down the back of the throat, through the vocal cords and into the airways. If a person has a breathing tube in place, the bronchoscope is passed through this tube.

Your doctor will be able to see the inside of the airways as the bronchoscope moves down. You may feel like you cannot “catch your breath,” but there is usually enough room around the tube to breathe and get enough oxygen. The doctor can also give you breaks during the procedure as needed.

The length of the bronchoscopy varies depending on what needs to be done and why you need it. The doctor can give you an estimate, but usually it can last from 15 minutes to an hour.

Risks of bronchoscopy

Bronchoscopy is a safe procedure. Serious risks from bronchoscopy, such as an air leak or serious bleeding, are uncommon (less than 5%). The risks associated with the procedure are as follows:

- **Discomfort and Coughing**—While the bronchoscope is passed through your nose and back of your throat into the lungs, it may cause some discomfort. It may also tickle your airways, causing a cough. You will be given medicine to help with this prior to the procedure.
- **Reduced oxygen**—Your oxygen level will be continuously monitored during the procedure using a pulse oximeter, with a sensor clip placed on your finger. The level of oxygen in the blood may fall during the procedure for several reasons. The bronchoscope may block the flow of air into the airway, or small amounts of liquid used during the test may be left behind, causing the oxygen level to drop. This drop is usually mild, and the level usually returns to normal without treatment. If the oxygen level remains low, the doctor will give extra oxygen or stop the test to allow for recovery.
- **Lung Leak**—Rarely, an airway may be injured by the bronchoscope, particularly if the lung is already very inflamed or diseased. The procedure could cause an air leak (pneumothorax) in which air comes out of the lung and gathers in the space around it, which can limit how well the lung expands. This complication is not common, and is more likely if a biopsy is taken during bronchoscopy. If there is a large or ongoing air leak, it may need to be drained with a chest tube. (For more information see the ATS patient information piece “Chest Tube Thoracostomy” at www.thoracic.org/patients).
- **Bleeding**—Bleeding can occur after the doctor performs a biopsy. Bleeding can also occur if the airway is already inflamed or damaged by disease. Usually bleeding is minor and stops without treatment. Sometimes a medication can be given through the bronchoscope to stop bleeding. Rarely, bleeding can lead to severe breathing problems or death.
- **Infection**—While equipment used is cleaned before and after use, there is a small risk that a germ could be

introduced into the airways that could cause infection. If a new infection develops, it would be treated.

What happens after the procedure?

Patients vary in how long it takes to wake-up with sedation. If you are in the intensive care unit on a ventilator (respirator; breathing machine), you may already be sedated and will continue to receive medicines to keep you comfortable on the ventilator. If you are an outpatient or a non-critically ill inpatient, you will need to stay in a recovery area until the sedative has worn off. You will also need to wait until the numbing medicine wears off before drinking any liquids. If you are an outpatient, it is recommended that you bring someone along to drive you home.

It is unlikely that you will experience any problems after the test other than a mild sore throat, hoarseness, cough, or muscle aches. If you feel chest pain or increased shortness of breath or cough up more than a few tablespoons of blood once you leave the hospital, contact your doctor immediately.

Your doctor can tell you how your airways look right away. Lab results take more time, usually 1–4 days or more depending on the specific test that is being done.

Authors: Manthous, C., Tobin, MJ and writing group for A Primer on Critical Care for Patients and Their Families

Reviewers: Marianna Sockrider MD, DrPH, Hrishikesh Kulkarni, MD, Al Faro MD, Kevin Wilson MD

Additional Lung Health Information

American Thoracic Society:
www.thoracic.org/patients/

ATS Patient Advisory Roundtable:
www.thoracic.org/patients/par/

National Heart Lung & Blood Institute:
www.nhlbi.nih.gov/index.htm

Centers for Disease Control & Prevention:
www.cdc.gov/



You are scheduled to have a bronchoscopy, a procedure that your doctor performs to examine your airways or take samples from your lungs.

- ✓ Do not eat or drink after midnight the day before the procedure.
- ✓ Review your medication schedule with your doctor.
- ✓ If you smoke, let your doctor know and do not smoke prior to the procedure.
- ✓ After the procedure, do not drink until you are told it is safe after numbing medicine completely wears off.
- ✓ Do not drive home by yourself after the procedure; arrange for a family member or friend to take you home.
- ✓ Contact your doctor immediately if you have shortness of breath or chest pain, or you cough up more than a few teaspoons of blood at home.

Doctor's Office Telephone:
