



Patient education: Flexible bronchoscopy (Beyond the Basics)

AUTHOR: Francis D Sheski, MD

SECTION EDITOR: Henri G Colt, MD

DEPUTY EDITOR: Geraldine Finlay, MD

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Literature review current through: **Dec 2024**.

This topic last updated: **Jul 02, 2024**.

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BRONCHOSCOPY OVERVIEW

Flexible bronchoscopy is a procedure that allows a clinician to examine the breathing passages (airways) of the lungs ([figure 1](#)). Flexible bronchoscopy can be either a diagnostic procedure (to find out more about a possible problem) or a therapeutic procedure (to try to treat an existing problem).

REASONS FOR BRONCHOSCOPY

Common reasons for bronchoscopy include the following:

- Unexplained symptoms related to the chest, such as persistent cough, coughing up blood, wheezing, hoarseness, noisy breathing, or shortness of breath. The airways are examined for signs of problems and samples of tissue (biopsies) or fluid can be taken and examined for evidence of infection or cancer.
- Persistent lung collapse (atelectasis) or collapse of the small air sacs in the lungs is sometimes evaluated using bronchoscopy. This may reveal a blockage, called an obstruction, from thick mucus, a foreign body, or a tumor. If possible, the clinician removes the cause of the obstruction to open the airways. Biopsies of abnormal tissue may be taken. In some cases, small tubes, called stents, are placed to hold the obstructed airway open.

- An abnormal chest x-ray may suggest problems that require closer inspection with bronchoscopy. Examples include a "spot" or mass, pneumonia, or other unexplained changes on chest x-ray or computed tomography (CT) scans. In most cases, fluid samples or a biopsy are obtained to look for signs of infection, cancer, or inflammation.

PREPARATIONS FOR FLEXIBLE BRONCHOSCOPY

Blood tests may be needed before the procedure to ensure that you have no problems related to blood clotting. Bleeding can sometimes occur after bronchoscopy, especially if tissue samples are taken. If you are on a "blood thinning" medication, you might be asked to temporarily stop taking it several days prior to the procedure. Examples of these medications include [aspirin](#), [clopidogrel](#) (brand name: Plavix), [warfarin](#) (brand names: Jantoven), [dabigatran](#) (brand name: Pradaxa), [apixaban](#) (brand name: Eliquis), [edoxaban](#) (brand names: Savaysa, Lixiana), [rivaroxaban](#) (brand name: Xarelto). It's also important to understand instructions about how and when to take other medications before the procedure and also whether smoking is permitted. In addition, it is important to let your doctor know if you have had previous allergic reactions or complications during medical or dental procedures.

If you have a medical problem involving blood sugar (ie, diabetes mellitus) and are on medications for it, you may need to adjust these medications under the direction of your doctor. Additionally, if you have a heart problem (for example, if you have a pacemaker or implantable cardioverter-defibrillator [ICD]), the doctor doing your bronchoscopy may need to consult with your cardiologist before the procedure.

It is important not to eat or drink for at least six hours before a bronchoscopy. Prior to the procedure, any dentures or other removable devices (eg, orthodontic appliances) should be removed from the mouth.

FLEXIBLE BRONCHOSCOPY PROCEDURE

Sedation and anesthesia — Bronchoscopy can be done in a special procedure suite, in an operating room, or, if needed, in another area of the hospital such as the intensive care unit. You should discuss any preferences regarding sedation in advance. In most cases, intravenous (IV) sedative medications are given before the procedure to make you feel drowsy and relaxed. These medications often cause you to forget what happened during the procedure. Sometimes general anesthesia may be used, in which case you will be unconscious for the entire procedure. Some clinicians also play music to create a relaxed and calm environment.

In the procedure area, you will be connected to a pulse oximeter to monitor the blood oxygen level. Blood pressure and heart activity are also monitored.

The back of the throat may be treated with a local anesthetic spray. This helps to prevent coughing and gagging during the procedure. However, the local anesthetic often has a bad taste. If sedatives are used, they are usually given after the throat is numbed.

Bronchoscope placement — During bronchoscopy, a thin tube called a bronchoscope is placed in the nose or mouth. The bronchoscope has a very small camera at its tip that displays pictures on a video screen or camera. Bronchoscopy is usually done with a flexible tube (flexible bronchoscopy). However, in a small number of cases, a more rigid tube is required (rigid bronchoscopy). The information provided here is relevant to people undergoing flexible bronchoscopy.

The bronchoscope is placed into either the nose or the mouth then advanced slowly down the back of the throat, through the vocal cords, and into the airways. Some people have an urge to cough or feel a sensation of wanting to catch their breath. If there is significant discomfort, more anesthesia can be given.

Once the bronchoscope has passed between the vocal cords, it is difficult to speak normally. This can be frightening, but it is expected and resolves when the bronchoscope is removed. Oxygen levels are monitored at all times to be sure you are getting enough air.

Examination — If you are partially alert during the procedure, you can listen as the doctor explains what is happening at each stage.

In some cases, samples of tissue and fluid are taken using devices passed through the bronchoscope. Other instruments can be used to remove foreign objects, secretions, abnormal growths, to place an airway stent, or to deliver radiation therapy directly to the abnormal area. During these procedures, the doctor may ask you if you have pain in the chest, back, or shoulders. In general, you should not feel pain. You may also be asked to hold your breath for short periods of time during parts of the procedure.

FLEXIBLE BRONCHOSCOPY COMPLICATIONS

Bronchoscopy is a safe procedure. Complications are infrequent and usually minor. Complications may be related to the procedure itself or to adverse reactions caused by sedatives or numbing medicines.

Bleeding — Bleeding can occur, especially if a biopsy is taken during the procedure. Bleeding is more likely if the airway is inflamed or damaged by disease. Usually, bleeding is minor and stops without treatment.

Fever and infection — Fever is relatively common after bronchoscopy but is not always a sign of infection.

Myocardial ischemia — Myocardial ischemia refers to a strain on the heart muscle caused by insufficient blood flow to the coronary arteries. A heart attack (myocardial infarction) is an extreme form of myocardial ischemia that results in damage to the heart. Certain people may be at risk for myocardial ischemia following bronchoscopy, including those with cardiac disease. Many doctors recommend delaying bronchoscopy for six weeks after a heart attack, if possible.

Reduced oxygen — The oxygen level in your blood is monitored continuously during bronchoscopy using a small probe that fits over your finger. The level of oxygen in the blood may fall briefly during the procedure. This drop is usually mild, and the level usually returns to normal without treatment. Extra oxygen may be given to maintain a safe level of oxygen in the blood.

Lung leak or collapse — In rare cases, the airway may be injured during bronchoscopy, particularly if the lung is significantly inflamed or diseased. If the lung is punctured, it can cause an air leak (pneumothorax), which results in lung collapse. This complication is more likely if a biopsy is taken during the procedure.

Death — Dying due to a bronchoscopy is extremely rare.

CARE FOLLOWING FLEXIBLE BRONCHOSCOPY

You will be monitored closely for several hours after bronchoscopy. Eating and drinking is not allowed until the effects of the anesthesia have worn off and you have a normal gag reflex; this usually takes a few hours. Some doctors routinely perform a chest x-ray after performing a biopsy to check for signs of a pneumothorax.

If you return home on the day of the procedure, you must not drive an automobile or operate heavy machinery, because of the lingering effects of sedation. A family member or friend must be available to drive or accompany you home.

Once at home, you may have a mild sore throat, hoarseness, cough, or muscle aches. This is normal. However, you should call for help immediately if you have increasing chest pain or shortness of breath, or if you cough up more than a few quarter-sized clots or teaspoons of blood. Fever (temperature greater than 100.4°F or 38°C) can occur after bronchoscopy, but usually for only for 24 hours. If fevers persist beyond a few days or exceed 101°F, you should contact your clinician.

Preliminary results about the overall appearance of the airways are usually available immediately after bronchoscopy. Results of any biopsies or other tests take more time, depending upon the specific test that was done.

WHERE TO GET MORE INFORMATION

Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our web site (www.uptodate.com/patients). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

Patient level information — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

[Patient education: Diagnostic bronchoscopy \(The Basics\)](#)

[Patient education: Lung cancer \(The Basics\)](#)

[Patient education: Coughing up blood \(The Basics\)](#)

[Patient education: Bronchiectasis in children \(The Basics\)](#)

[Patient education: Multiple pulmonary nodules \(The Basics\)](#)

[Patient education: Pulmonary nodule \(The Basics\)](#)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

This topic currently has no corresponding Beyond the Basics content.

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

[Flexible bronchoscopy in adults: Overview](#)

[Flexible bronchoscopy balloon dilation for nonmalignant airway strictures \(bronchoplasty\)](#)

[Detection of early lung cancer: Autofluorescence bronchoscopy and investigational modalities](#)

[Flexible bronchoscopy in adults: Indications and contraindications](#)

Rigid bronchoscopy: Instrumentation

Endobronchial ultrasound: Indications, contraindications, and complications

Endobronchial brachytherapy

Endobronchial electrocautery

Bronchoscopy: Transbronchial needle aspiration

Endobronchial ultrasound: Technical aspects

Airway stents

Endobronchial photodynamic therapy in the management of airway disease in adults

Bronchoscopic argon plasma coagulation in the management of airway disease in adults

Bronchoscopic laser in the management of airway disease in adults

Bronchoscopic cryotechniques in adults

The following organizations also provide reliable health information.

- American Thoracic Society

(<https://www.thoracic.org>, click on Patient Education)

- American College of Chest Physicians

(<https://journal.chestnet.org/>)

- American Lung Association

(<https://www.lung.org>)

- National Heart Lung & Blood Institute

(www.nhlbi.nih.gov/health-topics/bronchoscopy)

- National Library of Medicine

(www.nlm.nih.gov/medlineplus/healthtopics.html)

[1-9]

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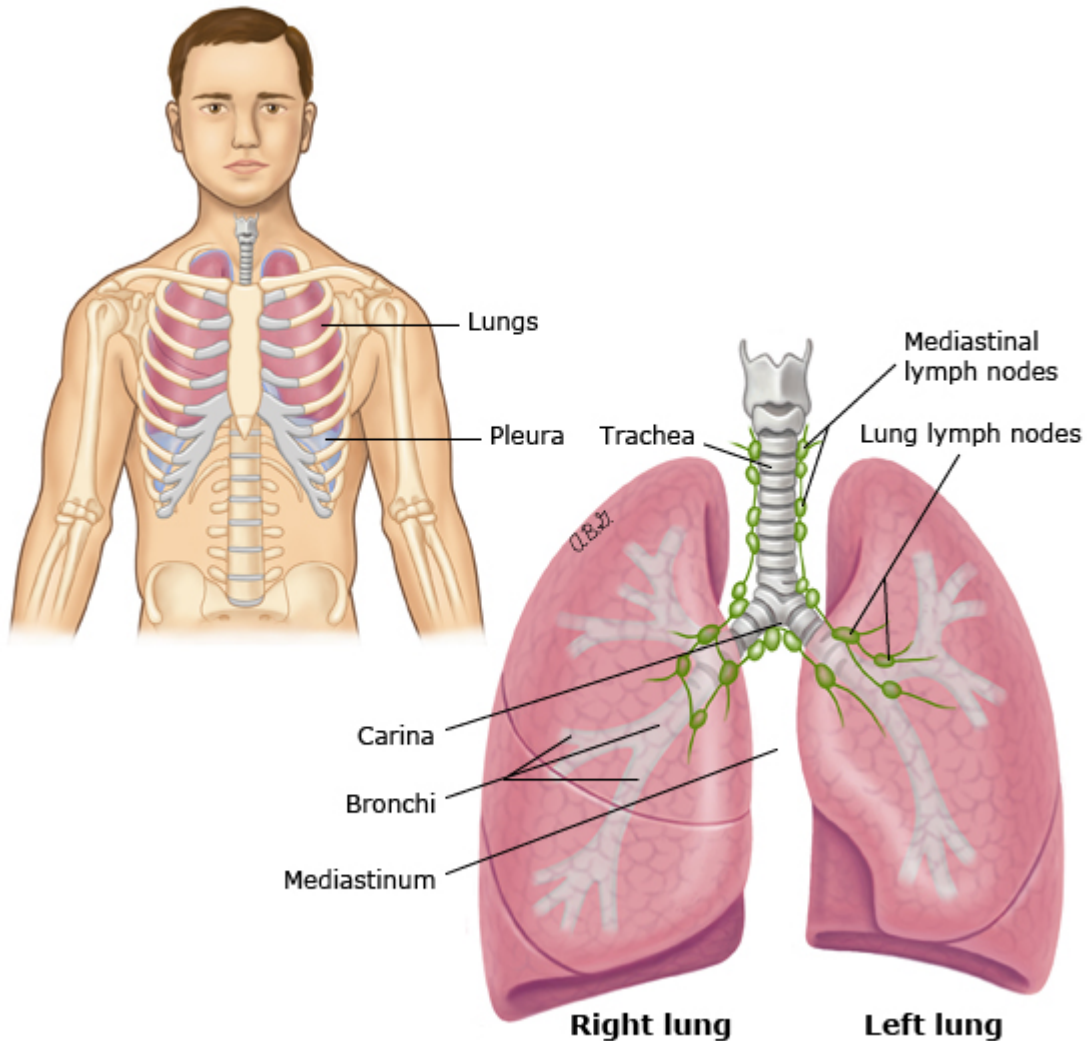
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GRAPHICS

Normal lung anatomy



The lungs sit in the chest, inside the ribcage. They are covered with a thin membrane called the "pleura." The windpipe, or "trachea," branches into 2 smaller airways called the left and right "bronchi." The space between the lungs is called the "mediastinum." Lymph nodes are located within and around the lungs and mediastinum.

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