

Pulmonary Medicine, Allergy and Immunology

FLEXIBLE BRONCHOSCOPY

AT CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC, we believe parents and guardians can contribute to the success of this test and invite you to participate. Please read the following information to learn about the procedure and how you can help.

Fast Facts About Flexible Bronchoscopy

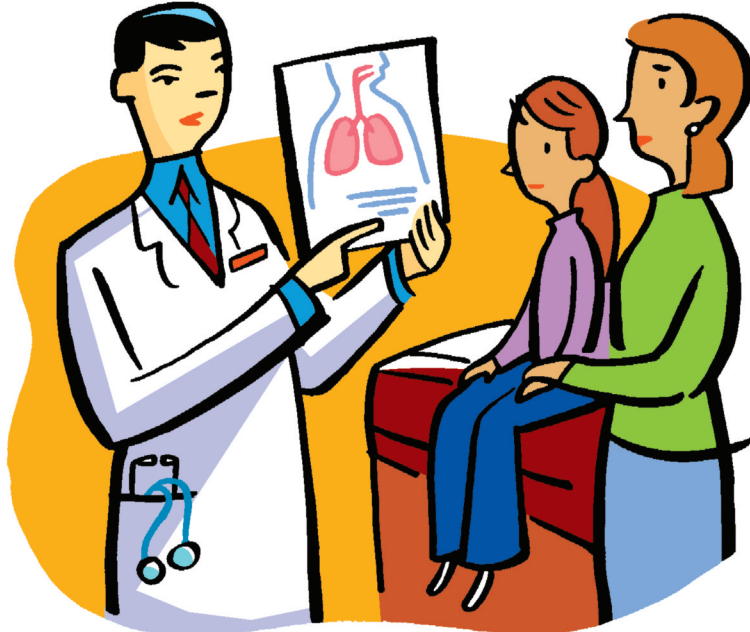
- A flexible bronchoscopy involves placing a special instrument with a tiny camera, called a bronchoscope, into the trachea (windpipe) and airways of the lungs.
- Bronchoscopy helps the doctor to see if the airways are blocked or narrowed, contain abnormal secretions (mucous) or a foreign body, and are in the right position in the lungs.
- The doctor may also wash a small amount of salt water into the lungs and suction it out so that it can be tested.
- Your child will receive sedation medication, a type of anesthesia, to help him or her relax and make the test more comfortable.
- When anesthesia is needed, there are special rules for eating and drinking that must be followed in the hours before the test.
- Bronchoscopy takes a total of 4 to 6 hours, including preparation and recovery.

Fast Facts About Sedation

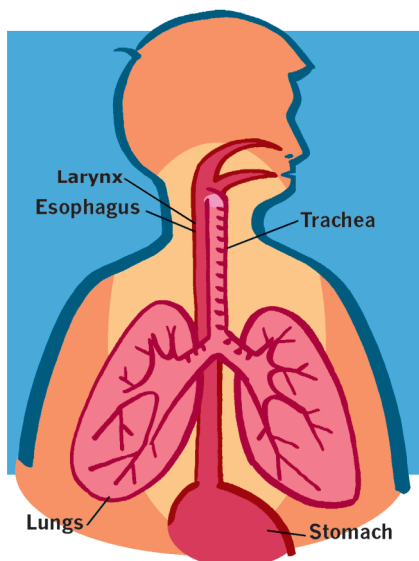
- Sedation means that your child will be given medication to make him or her very drowsy, relaxed and comfortable during the test.
- Although not completely asleep, your child will not feel any pain during the test or remember it afterwards.
- In many cases, a deeper type of anesthesia may be needed for parts of the test. This type of anesthesia is given by using a special "space mask" to make your child sleep and keep him or her comfortable throughout the test.
- A pediatric anesthesia doctor will give your child the sedation and/or anesthesia medications.

What Is Flexible Bronchoscopy Testing?

In a bronchoscopy (*bron-KOS-ka-pee*), a long flexible tube with a tiny camera, called a bronchoscope (*BRONK-a-scope*), is passed through the nose or mouth into the lungs. The doctor can see what the vocal cords, trachea (*TRAKE-ee-uh*) and the airways in the lungs look like.



- The bronchoscopy will be shown on a video screen and videotaped for the doctor to look at later.
- The bronchoscope also can take still pictures inside the airways that you and your child can look at and discuss later with the doctor.
- The bronchoscope has a small channel that allows the doctor to spray a numbing medication on the airway or vocal cords to keep your child comfortable during the test.
- If your child's bronchoscopy will be done through the mouth, the doctor will place a tube through the mouth and stop it just above the larynx (*LARE-inkx*) or voice box. This tube, called a laryngeal (*lare-en-GEE-ull*) mask, keeps the mouth open and allows the doctor to pass the bronchoscope through it to look at the airways and to give anesthetic gases.
- In some cases, a child will have an endotracheal (*en-doe-TRAKE-ee-ull*) tube placed instead. The endotracheal tube is placed through the mouth and stops in the trachea (windpipe.) Like the laryngeal mask, this tube allows the doctor to pass the bronchoscope through it to look at the airways and give anesthetic gases.
- Your doctor will decide whether to use a laryngeal mask or an endotracheal tube based on your child's medical needs.



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- The doctor might also do a bronchoalveolar lavage (*BRONK-oh-al-vee-OH-lar la-VOZH*), in which a small amount of saline (*SAY-leen*) or sterile salt water is sprayed into the airways through the channel in the bronchoscope, and then suctioned back out into a sterile container. The saline then contains cells from the airways of your child's lungs that can be looked at under a microscope to diagnose infections or other lung problems.
- In a very small number of cases, the doctor might also do a biopsy (*BYE-op-see*), in which tiny pieces of tissue are taken from inside the lungs to be looked at under a microscope. Your doctor will discuss this extra test with you if it is needed for your child.

Scheduling a Flexible Bronchoscopy

Before scheduling your child's bronchoscopy, it's very important to tell the doctor if your child is taking any blood thinners, aspirin, Plavix, or other medication that might slow blood clotting. These medications need to be stopped 5 to 7 days before the bronchoscopy test, and the doctor will tell you if it's safe for your child to be off these medications for this length of time.

Home Preparation

When sedation is needed, there are important rules for eating and drinking that must be followed in the hours before the test. One business day before your child's test, you will receive a phone call from a nurse between the hours of 1 and 9 p.m. (Nurses do not make these calls on weekends or holidays.) Please have paper and a pen ready to write down these important instructions.

- The nurse will give you specific eating and drinking instructions for your child based on his or her age. Following are the **usual** instructions given for eating and drinking. No matter what age your child is, you should follow the specific instructions given to you on the phone by the nurse.

For children older than 12 months:

- After midnight the night before the test, do not give any solid food or non-clear liquids. That includes milk, formula, juices with pulp, coffee and chewing gum or candy.

For infants under 12 months:

- Up to 6 hours before the **scheduled arrival time**, formula-fed babies may be given formula.
- Up to 4 hours before the **scheduled arrival time**, breastfed babies may nurse.

For all children:

- Up to 2 hours before the **scheduled arrival time**, give only clear liquids. Clear liquids include water, Pedialyte®, Kool-Aid® and juices you can see through, such as apple or white grape juice.

- In the 2 hours before the **scheduled arrival time**, give nothing to eat or drink.

Medications

- If your child takes other medication by mouth, ask the nurse if he or she may take it with a small sip of water and how close to the testing time it should be taken.
- If your child uses an inhaler, your child may use it before the test as he or she usually does. Please make sure to mention which inhaler medication and what time it was last used when asked about medications by the nurses and doctors before the bronchoscopy.
- You may bring along a "comfort" item—such as a favorite stuffed animal or "blankie"—for your child to hold during the test

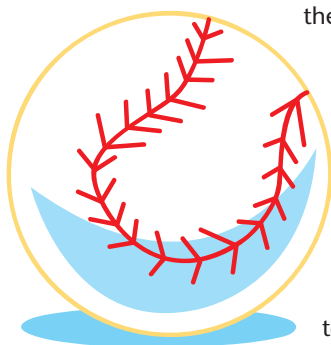
Before the Flexible Bronchoscopy

The flexible bronchoscopy is usually done in an operating room (OR) at Children's Hospital of Pittsburgh. The bronchoscopy may be done as an outpatient test through the hospital's Same Day Surgery Center or while your child is a patient in the hospital. If your child is in an Intensive Care Unit (ICU), the bronchoscopy can be done right in the ICU bed without moving him or her.

If your child is having an outpatient bronchoscopy, please allow extra time for driving and parking.

After you have registered your child at the desk, you will be asked to sit in the waiting area.

- You and your child will be called to the examining room and asked some screening questions by a staff nurse and an anesthesia nurse.
- The nurses will take your child's vital signs, weight and medical history. If your child has taken any medication before the bronchoscopy, mention the name of the medication and the time it was last taken.
- As the parent or legal guardian, you will be asked to sign a consent form for the test and anesthesia.
- You may ask any questions or discuss concerns about the bronchoscopy test at this time.
- If the doctor needs to do any other special tests, he or she will meet with you and your child to discuss them with you at this time.



The Flexible Bronchoscopy Test

You and your child will be moved to a holding room near the OR. There might be other patients and parents in the holding area at the same time. You and your child will meet with the actual anesthesia team who will be giving the anesthesia.

If your child is very scared or upset, the anesthesia team might give a special medication to help him or her relax while still in the holding room. This medication may be given by mouth or

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sprayed into the nose to make him or her sleepy. This medication takes effect in about 10 to 15 minutes. When the operating room is ready, your child will be taken to the OR and you will be directed to the OR waiting room.

- Once in the OR, your child will be given a small amount of anesthesia gas through the "space mask" to make him or her sleep. Once he or she is asleep, an intravenous (*in-tra-VEE-nus*) or IV line will be placed into a vein in your child's arm, unless your child already has an IV line in place. No needles will be used while your child is still awake.
- In cases when the bronchoscopy is being done through the mouth, the doctor will place a laryngeal mask with a tube going through your child's mouth and ending just above the vocal cords. The bronchoscope will go through this tube and the anesthetic gases will be given through a channel in the bronchoscope.
- In some cases, a child might need an endotracheal tube placed through the mouth and ending in the trachea. The bronchoscope will go through this tube and the anesthetic gases will be given through a channel in the bronchoscope.
- The channel in the bronchoscope also allows the doctor to spray a numbing medication on the airway or vocal cords to keep your child comfortable during the test. If the bronchoscope is going through your child's nose, the nose will be sprayed with numbing medication.
- Your child's heart rate, blood pressure, temperature and blood oxygen level will be checked continuously throughout the test.
- During the bronchoscopy, the bronchoscope will be placed through your child's nose or mouth into the throat and lungs so the doctor can see what the vocal cords and the airways in the lungs look like.
- The doctor also might perform a procedure called bronchoalveolar lavage or BAL. Using sterile saline, which is similar to tears, the doctor will wash a small area of the lung, then suction out the liquid and send it to the lab to be tested. Sterile saline is completely safe to use inside the body.
- The flexible bronchoscopy test will take between 5 to 30 minutes, but the total time in the OR may be up to 90 minutes.
- In some cases, specialists from other hospital departments, such as ENT or GI, might do needed tests while your child is still under anesthesia. Doing these tests one after the other during the same procedure is safer for your child so your child only has to go under anesthesia once. If other departments will be doing tests while your child is under anesthesia, you will be told beforehand and will have met with the other doctors doing the tests before your child goes to the OR.
- The flexible bronchoscopy itself only takes about 15 minutes; however, prep time before and after the bronchoscopy may take up to 90 minutes, depending on what tests are being done.



Waking Up

After the bronchoscopy, your child will be moved to the recovery room. You will be called so that you can be there as he or she wakes up.

- Your child might be wearing an oxygen mask to help him or her breathe during recovery from the anesthesia.
- Children coming out of anesthesia react in different ways. Your child may cry, be fussy or confused, feel sick to his or her stomach, or vomit. These reactions are normal and will go away as the anesthesia wears off. The length of time it will take the medication to wear off will vary, as some children take longer than others to become alert.
- Your child might be sleepy when he or she wakes up, and his or her throat might still feel numb.
- After your child's throat stops feeling numb and he or she is awake enough, nurses will give your child a Popsicle® or "slushy" to drink in the recovery room. Once the anesthesiologist sees your child can hold down the drink, your child will go back to Same Day Surgery or to his or her room. The time in recovery is usually about 1 hour to 3 hours, depending on how quickly your child recovers from the anesthesia and the bronchoscopy.
- Your child may resume normal activities, eating and drinking at the rate he or she is comfortable with when you get home.

A Parent's/Guardian's Role During the Test

- The most important role of a parent or guardian during the test is to help your child stay calm and relaxed. The best way to help your child to stay calm is for you to stay calm.
- Feel free to ask any questions, but please ask them before or after the test.

After the Flexible Bronchoscopy

After the flexible bronchoscopy, your child might feel tired for several hours and might have a sore throat, a cough and/or some blood in his or her saliva (spit) when he or she coughs. These should go away by the next day. If they don't, you should contact the doctor's office.

About half of the children who have had a bronchoscopy with bronchoalveolar lavage (BAL) will develop a low-grade fever 4 to 8 hours afterward. This fever is a normal response of the body and can be treated with Tylenol®. If your child develops a fever that is higher than 102.5 degrees F or 39.1 C, or does not respond to Tylenol, you should call the hospital and ask for the pediatric pulmonologist on call.

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Complications

All medical tests carry some risks. Although the risks from a flexible bronchoscopy are very low, you should know about the possible complications. They are:

- Bleeding from the tissues of the nose or airways from scraping by the bronchoscope. This bleeding usually is very minimal and almost always stops by itself.
- Infection. As the bronchoscope passes through the nose, it can carry bacteria above the vocal cords to the lungs. This risk is extremely small and is treated with antibiotics.
- Perforation (hole) in the airway leading to a collapsed lung. The risk of this complication is less than 1 in 1000. In that event, the air around the lung would have to be removed with a chest tube. This would mean your child would have to stay longer at the hospital until the hole in the lung is healed, which usually takes 1 to 3 days.

Special Needs

If your child has any special needs or health issues you feel the doctor or nurse needs to know about, please call the Division of Pulmonary Medicine, Allergy and Immunology at Children's Hospital of Pittsburgh **before the test** and ask to speak with a nurse. It is important to notify us in advance about any special needs.

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To see the list of all available patient procedures descriptions, please visit www.chp.edu/procedures.