

Tracheostomy: What It Is and When It Is Needed

The respiratory system

There are two parts to the body's breathing system - the upper airway and the lower airway. The nose, mouth, throat and larynx form the upper airway. The lower airway includes the windpipes (trachea), air tubes (bronchi), and air sacs (alveoli).

The nose is lined with a mucus membrane that has many blood vessels near the surface. The blood vessels pick up warmth and moisture as air passes through the nose. This is important because cold, dry air irritates the lungs. The nose is also lined with tiny hairs (called cilia). The cilia clean dirt and dust from the air before it passes into the throat and lungs.

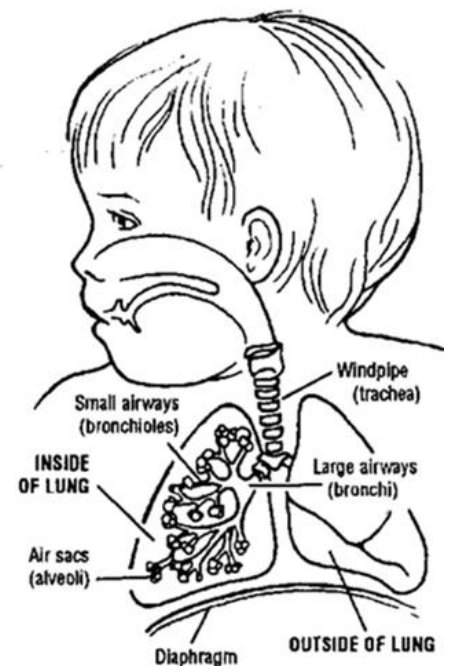
The mouth does not warm and moisturize the air as well as the nose does. The mouth also does not have cilia to filter out the dirt and dust.

After the air goes through the nose or mouth, it enters the pharynx. The pharynx is the top part of the throat behind the nose and mouth. The other part of the throat - the larynx - is called the voice box and includes the vocal cords. As air passes through the larynx on the way out of the lungs, the vocal cords vibrate. The vibration is what makes the sounds when you talk.

The trachea is the tube-like structure that carries air from the throat to the lungs. The trachea divides into two tubes as it goes into the chest. The tubes are called the right and left main stem bronchi (BRONK eye).

Like branches on a tree, the two branches of the trachea divide into smaller tubes and end in the air sacs. The body gets rid of carbon dioxide and takes in oxygen through the air sacs (Picture 1).

Behind the trachea is the esophagus. The esophagus (eh SOF uh gus) is the tube that carries food from the mouth to the stomach. The trachea and the esophagus are two separate tubes.



Picture 1 Respiratory system

Reasons for a tracheostomy

Your child's doctor will talk with you about why your child needs a tracheostomy. The length of time your child has a trach tube depends on the reason for the trach tube. The tube helps breathing and helps clear mucus from the airway.

The more common reasons for a tracheostomy are listed below.

- **A blockage in the upper airway:** if the upper airway is blocked, air cannot get into the lungs. The trach tube helps your child breathe.

Paralyzed vocal cords may also block the upper airway. When the vocal cords do not open, air does not get through and the child cannot breathe. The trach tube lets the child breathe normally.

Other conditions that may block the upper airway include polyps; narrowing of the trachea; or weak muscles in the trachea. When the muscles in the trachea are weak, the trachea closes and blocks airflow.

- **Inability to clear mucus from the lungs and airway:** lungs make mucus. Mucus cleans the lungs by picking up tiny bits of dirt and dust. Cilia, which line the lungs, help the mucus carry the dirt and dust out of the lungs. This protects the lungs from irritation and infection.

Some children are not able to cough mucus out of the lungs and airways. If mucus stays in the lungs, the child is more likely to get infections. The trach tube provides a way to help clear mucus from the lungs.

- **Long-term help with breathing:** A trach tube is put in when a child has to be on a ventilator for a long time. Your child may have to use the ventilator at home after the trach is placed. There are many reasons why a child may need long-term help with breathing. You need to discuss this with your child's doctor.

How a tracheostomy changes the respiratory system

When a tracheostomy tube is in place, the child breathes through the trach tube instead of through the nose or mouth. Therefore, very little air passes through the nose, mouth, or larynx. Remember, the nose and mouth warm and clean air during breathing. Air that passes through the larynx forms sound.

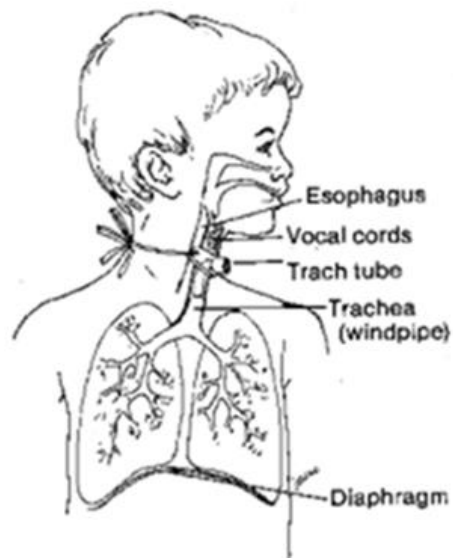
- Your child will not be able to cry or talk while the trach tube is in place. Air passes out of the lungs through the trach tube. It does not go through the nose and mouth, and does not pass over the vocal cords to make them vibrate.
- There are special devices that let a child talk with the trach tube in place. If your child can use one of these devices, the doctor or nurse will talk to you about it.
- Air that enters the lungs through the trach tube is not warmed, humidified, or cleaned. This air can irritate the lungs. You will learn how to protect your child's lungs from cool, dry, or dirty air.

The surgery

The surgery to insert a tube in the trachea is called a tracheostomy.

The surgeon makes an opening, called a stoma, in the front of the neck, below the larynx (Picture 2).

The surgeon puts a curved plastic tube called a tracheostomy tube into the stoma.



Picture 2 The tracheostomy tube is placed into the trachea below the level of the vocal cords.

Choosing the trach tube

There are many types of trach tubes: uncuffed, cuffed, fenestrated, disposable, and reusable. The type of trach tube your child has depends on:

- The reason your child needs the trach
- The size of your child's trachea

During the surgery, the doctor will put in the correct size and type of trach tube. Often the first trach tube has a cuff. The cuff is a filled balloon that seals off the air leak from the stoma. Right after the surgery, a trach with a cuff helps your child and the ventilator (breathing machine) work together to breathe.

The surgeon will change the first trach tube one week after surgery when the stoma has healed. If your child does not need a cuffed trach tube at that time, the surgeon will replace it then or before your child leaves the hospital.

Making the decision about a trach tube

It is not easy to decide about a tracheotomy for your child. You may have mixed feelings about it. Ask your doctor and trusted advisors any questions you may have.

A tracheostomy may be temporary or it may be permanent. The doctors will explain your child's specific needs to you before the surgery. When your child has recovered from surgery, the doctors review his needs again and discuss this with you.

Sometimes a tracheostomy is permanent. Many children who have a tracheostomy might need to stay on a ventilator at home.

If you agree to a tracheostomy for your child, you will learn how to care for the trach, including:

- Suctioning
- Changing the trach ties
- Doing CPR with a trach
- Cleaning the stoma
- Changing the trach tube
- Problem-solving

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Making the decision about a trach tube, continued

You will go to classes in the Family Resource Center. There, you will practice these skills on a doll. Plan to go to class right after the trach surgery and before the first trach change by the surgeons.

You will help with your child's trach care after he or she has the first trach tube change, and after you go to class. This allows you to practice at the hospital and learn what to do at home.

When you are ready, you will do your child's care for a 24-hour period at the hospital. Your child's nurse will help when you need it. This is set up so you are prepared to care for your child at home.