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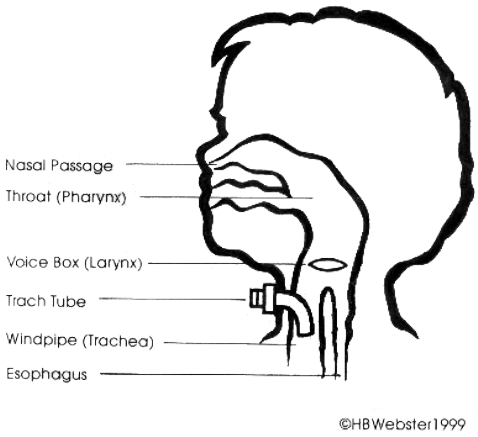
TRACHEOTOMY: REASONS, COMPLICATIONS, AND CARE

What is a tracheotomy?

The trachea is the part of the airway (or breathing passage) commonly known as the "windpipe". A tracheotomy is a surgical procedure that creates a temporary opening in the trachea. The opening itself is called a tracheotomy. The tube that is placed through this hole is called a tracheotomy tube.



What are the indications for a tracheotomy?

A tracheotomy is a temporary or permanent treatment for a variety of causes of breathing issues in which the creation of a new breathing pathway is required through the neck. This bypasses the nose, mouth, and upper throat. A tracheotomy is usually considered when an endotracheal (ET) tube (a tube that goes in the throat through the mouth) either will not be effective (in some emergency situations for example), or would be required for a long time. Sometimes, a tracheotomy is performed when an ET tube cannot be placed due to narrowing of the windpipe or blockage of the voice box (larynx).

The reasons for performing a tracheotomy in children generally fall into three major categories:

1. To bypass an obstruction in the airway (most common reason)
2. To help with long term ventilation in patients who cannot do this on their own (patients with respiratory muscle problems or lung problems)
3. To provide a temporary airway while reconstructive surgery is performed that may cause breathing problems

Who can perform a tracheotomy?

You may have heard of situations in which a tracheotomy was performed in an emergency, outside of the hospital. This procedure is actually called a cricothyroidotomy and is strongly discouraged even when the person performing it has some experience. It is a difficult procedure to perform in an adult, and even more dangerous on a child, as the child's airway is much smaller and more difficult to locate than in adults. If a patient is choking and unable to breathe, the Heimlich maneuver (hands pushing in and up on the abdomen) should usually be the first option considered.

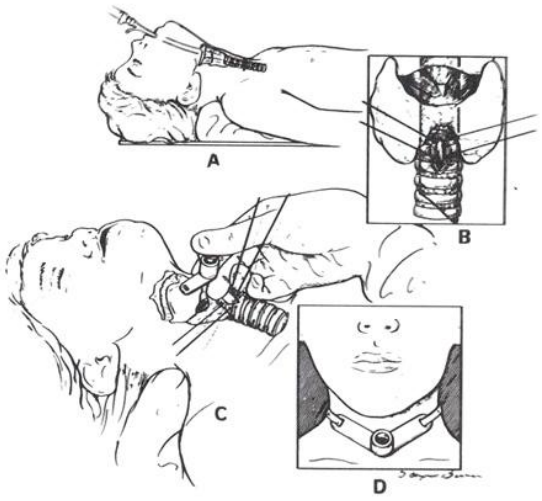
A tracheotomy is traditionally performed in a hospital setting by a physician who has extensive experience in this procedure. With advances in airway management, the number of tracheotomies required has been reduced.

This procedure is usually performed by a pediatric ear, nose, and throat specialist in children.

What is involved with a tracheotomy in a pediatric patient?

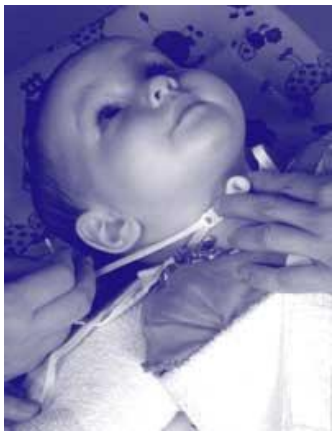
The airway anatomy is different in a child compared to an adult; therefore, the surgical technique used is different for pediatric (child) patient.

In the child, a tracheotomy is almost always performed under general anesthesia (patient fully asleep). Because of the small size (similar to the size of a straw) of the airway, this procedure may be performed with a bronchoscopy or endotracheal tube in place during the procedure to help localize the trachea. The patient is placed on the back and a rolled towel is placed under the shoulders and neck to put the trachea in its most accessible position. A cut is carefully made in a specific location in the trachea and sutures (stitches) are placed on each side of the cut to help easily locate the new opening (tracheotomy). A tracheotomy tube is placed into this hole and tied securely in place. After the tracheotomy tube has been tested to make sure airflow is adequate, the bronchoscope or endotracheal tube is removed. A chest x-ray is typically taken to check for proper placement and to ensure that the lungs are fully functional after the surgery.



The tracheotomy tube will be changed approximately 1 week after surgery. After this, parents are thoroughly educated in the care of the tracheotomy tube prior to the child going home.

How long does the tracheotomy tube need to remain in place?



The length of time a tracheotomy tube needs to remain in place depends on the exact reason the tube was needed. For a temporary breathing problem, the tracheotomy tube may be removed after just a few months. Home nursing is usually arranged for a period of time after discharge. The ear, nose, and throat surgeon and other health care providers perform close follow-up. Speech/language pathologists are usually involved with your child as well. They will help with swallowing and speech while the tracheotomy tube is present.

How is a tracheotomy tube removed?

The name for tracheotomy tube removal is decannulation. Decannulation is always performed in the hospital setting. First the patient's airway is re-examined through a microlaryngoscopy/bronchoscopy to make sure there are no reasons the tracheotomy tube should not be removed.
Depending on the situation, there are several different ways decannulation may be carried out. Among these are:

- Simply remove the tube and allow the tracheotomy site to heal
- Put in a smaller tracheotomy tube in and plug over the hole of the tube during awake hours only until the child can tolerate plugging comfortably for one month

- If the airway is being reconstructed (a small airway being enlarged for example), the tracheotomy tube may be removed along with this procedure or after the surgical site heals.
- Remove the tracheotomy tube during a surgical procedure with surgical closure of the opening

What are the risks and complications involved with a tracheotomy?

Early Complications that may arise during the tracheotomy procedure or soon thereafter include:

- Bleeding
- Air trapped underneath the skin around the tracheotomy (subcutaneous emphysema) or in deeper layers of skin in the chest (pneumomediastinum)
  that may leak around the lungs (pneumothorax)
- Damage to the tube going to the stomach (esophagus)
- Injury to the nerve that moves the vocal cords (recurrent laryngeal nerve)

However, many of these early complications can be avoided or dealt with appropriately with an experienced surgeon in a hospital setting.

Later Complications that may occur while the tracheotomy tube is in place include:

- Accidental removal of the tracheotomy tube (accidental decannulation)
- Infection in the trachea and around the tracheotomy tube

These complications can usually be either prevented or quickly dealt with if the caregiver has proper knowledge of how to care for the tracheotomy site.

Delayed Complications that may result after longer-term presence of a tracheotomy include:

- Thinning (erosion) of the trachea from the tube rubbing against it
- Development of a small connection from the trachea to the esophagus
- Development of bumps (granulomas) that may need to be surgically removed before decannulation can occur
- Narrowing or collapse of the airway above the site of the tracheotomy, possibly requiring an additional surgical procedure to repair it
- Once the tracheotomy tube is removed, there may remain a small hole between the trachea and the skin, which may need surgical closure

A clean tracheotomy site, good tracheotomy tube care, and regular examination of the airway by an otolaryngologist should minimize the occurrence any of these complications.