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CARE AT HOME:

# TRACHEOSTOMY

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A guide for caregivers

**Children's**<sup>®</sup>  
MINNESOTA

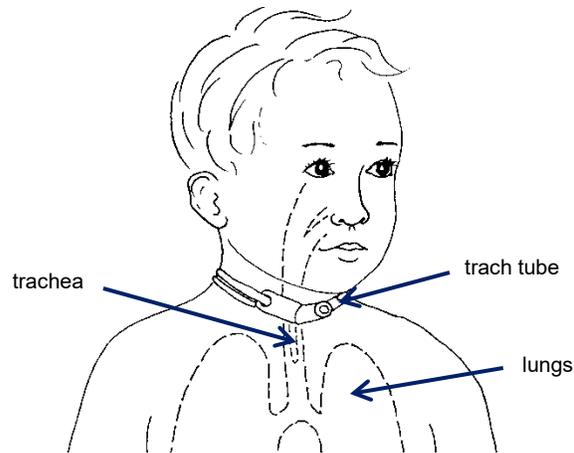
[childrensMN.org](http://childrensMN.org)

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# What is a tracheostomy?

A tracheostomy (*tray-kee-ah-stoh-mee*, or “trach” *trayk*) is a surgical opening made in the front of the neck into the trachea (windpipe). A short tube is put into the stoma (opening in the neck). The child breathes through the trach tube instead of through the nose and mouth.



Depending on your child's condition, the tracheostomy may or may not be permanent.

Your child needs a trach for one of these reasons:

- airway problems
- tracheomalacia (soft windpipe)
- stenosis (narrowing of the airways)
- airway needs to be on the ventilator (breathing machine) for a long time
- other: \_\_\_\_\_

At first you will not be able to hear your child cry or talk with the trach tube in place. This is because the air goes out through the tube and does not pass through the vocal cords. However, most children can learn to talk through a speaking valve attached to their tracheostomy tube.

## Common Terms

*Adapted from [globaltrach.org](http://globaltrach.org)*

**Tracheotomy, tracheostomy:** You might hear either of these words used. “-otomy” means “to cut into” and “-ostomy” means opening into”. A tracheotomy is the procedure to make a tracheostomy, or the opening into the trachea, or windpipe.

**Cannula, inner:** the part of the tracheostomy tube that can be removed and cleaned or replaced

**Cannula, outer:** the part of the tracheostomy tube that stays in place

**Cuff:** the balloon at the end of the tracheostomy tube

**Decannulation:** removal of the tracheostomy tube

**Fenestrated tracheostomy tube:** opening on the shaft of the tube that allows air to pass through it. When it fits properly, it can allow people to speak.

**Flange, phalange:** the part of the tracheostomy tube fixed against the neck

**Inflation line:** the tubing that connects the pilot balloon with the cuff

**Laryngectomy:** removal of the larynx (vocal cords or voicebox)

**Mucus plug:** an accumulation of mucus that can obstruct the airway

**Obturator:** the part of the tracheostomy tube that comes off and can function only to insert the tube. It should always be available in case the tube accidentally comes out

**Pilot balloon:** a balloon that is attached to the cuff. When the balloon is inflated, there is air in the cuff. When the balloon is completely flat, there is no air in the cuff.

**Speaking valve:** usually a one-way valve that fits on the tracheostomy tube. It allows air to pass into the tracheostomy, but closes on exhalation, forcing air into the mouth and nose, allowing speech. It should only be used on a cuffless tube, or one with a fully deflated cuff.

**Stoma:** skin around the opening

**Suctioning:** removal of tracheal secretions or mucus

**Heat Moisture Exchanger (HME):** a device that fits on the tracheostomy tube and collects exhaled water vapor, increasing humidity.

**Tracheal diversion:** is performed to manage chronic aspiration. This procedure is a permanent surgical solution and detaches the upper airway from being used again. The stoma is larger, and frequently the patient has nothing placed in the stoma during the day, and has a trach tube placed at night to connect to a machine for breathing support.

## What to expect during your child's stay

While your child is at Children's Minnesota, you can expect education on the new tracheostomy:

- Eight hours of information shared in a classroom with a respiratory therapist.
- Hands-on education with your child while in their room with nursing and respiratory care teams.
- Patient and family/caregiver(s) will have overnight stay to practice tracheostomy cares, using nursing staff as a resource by the time of discharge.
- Meeting with home care nursing staff (as applicable).
- Meeting with Durable Medical Equipment (DME) staff (as applicable).

# Types of trach tubes

Tracheostomy tubes may be made of plastic, silicone or metal. Some trach tubes contain metal parts. (If your child needs an MRI scan, your child's tube will be replaced with a non-metal one.)

There are many different brands and styles of trach tubes. Most trach tubes are one piece, but some older children have two-piece tubes with both an inner and an outer cannula. Your child's tube will either cuffed or cuffless. A cuff is a small balloon at the end of the tube that can be inflated by inserting sterile water or air into the top part of the trach tube. The cuff is usually prescribed for a child who has difficulty controlling secretions or needs help preventing leakage of air from the breathing machine.

## **BRANDS:**

### **Shiley**

This tube is made out of polyvinyl chloride, and may be used for MRI procedures because there is no metal in this tube. It is changed just prior to procedure and when it is completed, changed back to usual type tube. It feels stiffer than other brand types.

### **Bivona**

This tube is made out of silicone. There is a silicone-coiled wire down the cannula that gives the tube flexibility. It comes in varying lengths.

## **TUBE CHARACTERISTICS:**

### **Bivona Flextend**

This tube has an extra extension between the hub and the neck plate. This is used for patients that do not have good head control and could cover their trach tube opening. It is also a good idea to prevent pinching the neck skin when connecting to breathing support equipment. The safe suction depth needs to be re-adjusted when switching to this type of tube. Another feature of this tube is the triangle markings on the neck plate and outer shaft of trach tube. This indicates it is MRI compatible.

### **Cuffed trach tubes**

This type of tube has a small balloon near the end of the cannula that is inside the stoma. It also has a pilot balloon outside of the cannula which lets you know a cuff is present and the volume in the cuff is equal to the volume in the pilot balloon. This volume is inserted into the pilot balloon through a syringe that is either filled with air or sterile water. The syringe has a luer lock or twist connect to the pilot balloon. The amount of volume to inflate cuff is determined by using minimal leak technique. This procedure is filling the cuff to the max volume indicated by the manufacturer's instructions. Then pulling the volume back until you can hear a "leak" with stethoscope over the trachea. The cuff needs to be deflated once a day, and re-inflated with prescribed volume to maintain accuracy. Usually the volume is determined by inflating .5 ml at a time until you do not hear a leak with stethoscope placed over neck area. Then the syringe is slightly drawing back until air can be heard moving through area. A cuffed tube is ordered when a patient needs a breathing support machine, and it leaks due to air around tube.

## Inner cannula trach tube

This type of tube is used with a larger patient with a larger stoma. The goal for these types of tubes is to change them less frequently. The tube has two parts, an inner and outer cannula. The inner cannula is removed for suctioning, soaked in a basin with sterile water and half-strength hydrogen peroxide and rinsed with sterile water before inserting back into the outer cannula. The inner cannula is held in place either by a luer twist lock for the non-disposable type, or a squeeze pinch for the disposable inner cannula. When the inner cannula is removed for suctioning, beware that in the event of an emergency, you cannot directly connect any type of breathing support equipment. The inner cannula needs to be in place. Note also that the inner cannula should always be removed for deep sterile suctioning to prevent secretions from hardening between the two pieces.

## SPECIALTY TUBE TYPES

### Metal trach tubes

This type of tube is more rigid and not used very much. The use of this tube is usually limited to a special circumstance such as tracheal reconstruction.

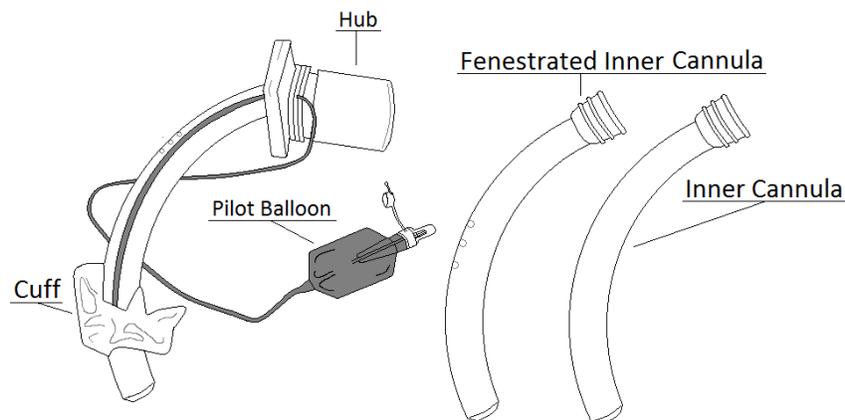
### T-tubes

A t-tube may be ordered if needed to stabilize a floppy or narrowed trachea. This is a stent to keep the airway open. There will be special training for this type of t-tube.

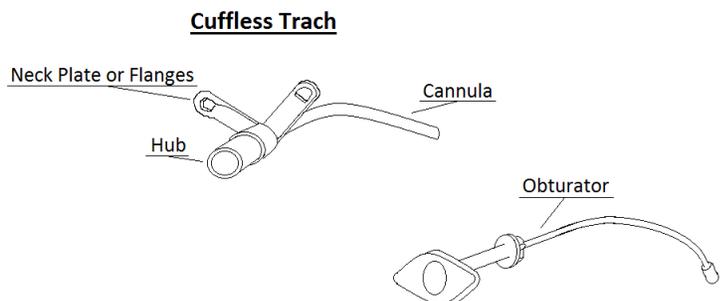
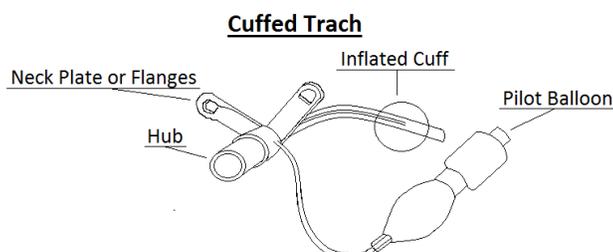
### Parts of a trach tube:

An obturator is round-tipped device, which is placed in the trach tube to make insertion easier and prevent damage to the windpipe. It is only used when inserting a trach tube and is removed once the trach tube is in place. Always keep it handy, it may also be used as a guide for how deep to suction the trach.

### Tube with inner cannula



### One-piece trach (Available cuffed or cuffless)



# How will I care for my child at home?

Your care team will work alongside you to feel confident and comfortable in caring for your child before going home. Children's Minnesota will provide at least eight hours of structured classroom content and training at the bedside. You will also have an overnight stay with your child to do cares independently.

It is important to care for your child as normally as possible. However, there are some special things you will need to do:

- Prevent infection.
- Suction the mucus out of the tube.
- Clean the trach opening.
- Change the trach ties.
- Change the trach tube.
- Give humidity.
- Watch for breathing problems and know what to do if they occur.
- Daily check of all emergency supplies, including the travel bag. It should always be in the same place so everyone knows where to find it in an emergency. A trach tube that is the next size smaller should also be in the same place. This is for back-up use if you cannot insert the regular size trach tube.

You may feel afraid when you first start taking care of your child on your own. This is normal. There are many things to learn, but the tasks get easier as you become used to them. We want you to feel comfortable doing these procedures before you take your child home. We will provide you classroom and hands on training while you are in the hospital. The health care team is here to teach you and help you become comfortable with your child's care. If you have a question or feel uncomfortable let us know.

Some cares you will do several times a day and some cares you will do several times a week. It helps to have a calendar with your day's activities clearly marked. Organization, a schedule and help from family members is important. It is important for several people to learn to care for your child so you can have a break and get out by yourself.

# Preventing infection

It is very important to prevent infection. Cleanliness is a must! Each time you do a procedure with the trach, follow these steps:

- Prepare a clean work area by cleaning a solid surface with household cleaner (do not use a spray) and lay a clean towel on it.
- Wash your hands with liquid hand soap for at least 15 seconds, rubbing all surfaces briskly, or use an alcohol hand sanitizer.

Equipment maintenance and cleaning instructions will be provided to you by your home care equipment company.

# Suctioning the trach tube

Suctioning is done to remove mucus from the child's airway or breathing passages. This should be done when:

- you hear loud gurgles in the trach tube.
- you see bubbles in the trach.
- you feel rattles on your child's back or chest.
- your child seems agitated and restless, is sweating, or cries and cannot be comforted.
- your child is having trouble breathing.
- faster breaths or heart rate.
- pale, bluish, or grayish color around eyes, mouth or fingernails.
- flaring nostrils.
- retracting (chest or neck skin pulls in with each breath).
- your child's breathing machine is alarming high pressure.

**Safe suctioning** is very important for your child. Always follow guidance for safe suctioning depth according to the size of your trach.

Catheter size: Suction to \_\_\_\_\_ at the trach hub.



There are several ways to suction:

- machine and sterile suction catheter kit
- shallow superficial suctioning device
- inline sterile suctioning kit

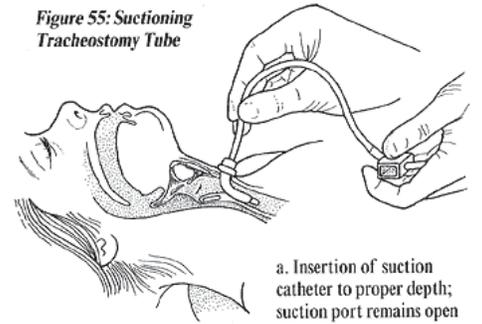
### Suctioning with a machine and sterile catheter kit

Suction with the machine and catheter at least every 8 hours and as needed — usually in the morning, before meals, at bedtime and after airway clearance therapy. Often a child will be able to cough up mucus.

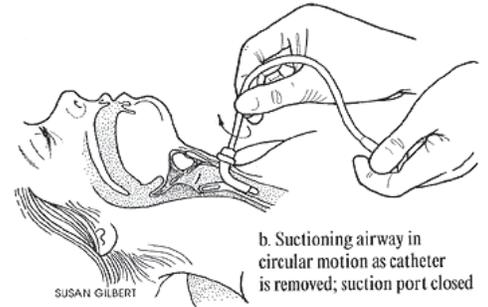
Have all equipment together and ready to use at all times:

- normal saline
- resuscitation bag
- sterile water
- suction catheter kit
- suction machine (portable or stationary)
- verify safe suction depth

Figure 55: Suctioning Tracheostomy Tube



a. Insertion of suction catheter to proper depth; suction port remains open



b. Suctioning airway in circular motion as catheter is removed; suction port closed

Illustration source:

The Center for Pediatric Emergency Medicine (CPEM). Teaching Resource for Instructors in Prehospital Pediatrics. Illustrations by Susan Gilbert.

## How to suction with a sterile catheter kit

- Prepare the work area.
- Clean your hands well.
- Establish safe suction depth with obturator. Note safe suction depth for your child's trach.
- Turn on the suction machines. Check the pressure gauge if there is one on the unit.
- Open the catheter kit and fill the cup with sterile water. (Everything inside the kit package is sterile when you first open it).
- Put on the sterile gloves, using sterile technique. Keep your suctioning hand sterile. Do not touch anything that is not sterile.
- Pick up the sterile catheter with your sterile suctioning hand and the suction tubing with your non-sterile hand. Connect the two ends.
- Determine safe suction. See page 7 for a safe suction visual.
  - Insert the catheter into the trach, no further than the length of the obturator. Do not block the thumbport when inserting into the catheter.
  - To apply suction, block the thumbport with the thumb of your non-sterile hand. While withdrawing the catheter, slowly and gently rotate it between your thumb and fingers.
  - If the mucus is difficult to remove: put ½ to 1 mL of normal saline into the trach tube to help move the mucus during suction. This will usually cause the child to cough.
  - Note: Routine use of lavage is not recommended due to risk of infection. Use only if unable to easily remove mucus.
- Suction no longer than 5 seconds each time the catheter is put into the trach. You may need to give your child breaths with the resuscitation bag. Typically it will take 2–3 suction passes to clear your child's trach tube.
- The child may need to be suctioned again after taking a few breaths. Wait 15 to 20 seconds and allow your child to recover before repeating. You may need to give your child breaths with the Manual Resuscitation breathing bag. Increase the oxygen as needed.
- Stop suctioning when you do not hear mucus or see it in the suction catheter or if your child is showing signs of not tolerating suctioning well.
- Throw away the catheter and gloves.
- Turn off the suction machine.
- Wash your hands again.

## Suction with an in-line suction catheter

Suction with the machine and in-line catheter at least every 4-6 hours and as needed — usually in the morning, before meals, at bedtime and after chest physiotherapy (CPT). Often a child will be able to cough up mucus. In-line suction catheters are placed and changed out as directed by your home equipment provider.

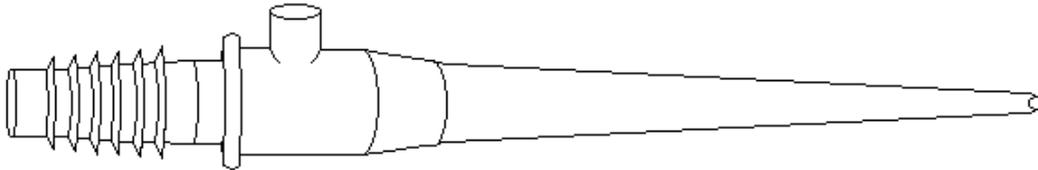
- Have all the equipment together and ready to use.
  - normal saline bullets
  - in-line suction catheter
  - suction machine (portable or stationary)
- Prior to suction with an in-line catheter:
  - Prepare the work area.
  - Clean your hands well.
  - Establish a safe suction depth. Review the safe suction depth information on page 7.
- Turn on the suction machine.
- Check the pressure gauge. Proper suction must be according to your child's size:
  - 60– 80 mm Hg for newborn
  - 60–100 mm Hg for infants
  - 100–120 mm Hg for ages 2 years to adult

## How to suction with an in-line catheter

- Remove the cap from the suction port and attach to closed catheter system.
- Set suction to appropriate pressure (while holding down the thumbport adjust to pressure setting).
- Measure depth of catheter. The suction catheter should not go deeper than slightly beyond the end of the tracheostomy tube. This depth is referred to as the safe suction depth. To determine insertion length:
  - Advance the catheter with the pinch and push technique until the measured color is aligned to the same suction depth (the bag should be “bunched up”).
  - When the catheter is at the correct depth, depress suction button and hold for 2 seconds before slowly withdrawing the catheter with continuous suction (5 seconds). Withdraw until the black mark on the end of the catheter is visualized and completely removed from the airway.
  - Watch the window at the thumbport carefully for the secretions being removed. Note amount, color and consistency.
- Flush catheter with normal saline between “passes” while watching the catheter window. To flush catheter, depress thumbport while slowly instilling saline into catheter. Note: if you pull back too far, the plastic bag may inflate (puff up). If this happens, reinsert and advance the catheter just a little and squeeze down.

## Shallow suctioning

### Shallow suctioning device — Lil Sucker®



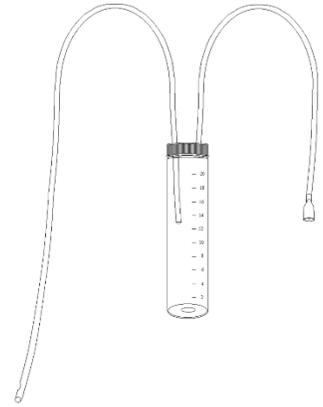
A shallow suctioning device (SSD) such as a Lil Sucker® is used to remove mucus that has been coughed up to the hub of the trach. You may use it as often as needed if your child is able to cough his or her secretions.

- Clean your hands well.
  - Attach the SSD to the suction machine tubing.
  - Place the tip of the SSD just into the trach hub. Cover the thumbport to apply suction. Never block the trach opening.
  - Rinse the SSD with sterile water.
  - Store the SSD in a clean area between uses.
  - Wash your hands again.
- Discard the SSD with home equipment instructions.

## Suctioning with a De Lee® suction catheter (emergency use by family members only)

A De Lee® suction catheter with a mucus trap is used as a backup for suctioning if the portable suction machine fails. It is used once and thrown away. Keep a De Lee in your travel/emergency kit.

- Clean your hands well.
- Pick up catheter without touching the sterile end that goes into the trach.
- Put the mouthpiece into your mouth.
- Insert the catheter into the trach to the safe suction depth for your child.
- Apply suction by sucking on the mouthpiece. While withdrawing the catheter, slowly and gently rotate it between your thumb and fingers. The mucus will go into the mucus trap.
- Throw the De Lee® away.
- Wash your hands again.



# Cleaning the trach opening

- Clean the area around the stoma at least daily as directed by your child's doctor, or more often if needed.
- Prepare the work area.
- Wash your hands well.
- Gather supplies:
  - clean cloth
  - sterile cotton swabs
  - cleaning solutions as prescribed by your doctor:
    - sterile water
    - sterile normal saline
    - ¼ strength Acetic Acid
    - other prescribed cleaning agents
- Wet a cotton swab with the cleaning solution.
- Support the trach tube with your fingers while cleaning.
- Roll the cotton tip over the skin around the trach tube to remove crusted secretions and drainage. Make one swipe away from the stoma with each swab, then discard. Then clean the flange (trach plate) the same way. Use as many cotton swabs as needed.
- If cleaning solution other than normal saline is used, rinse the stoma and flange with a cotton swab dipped in normal saline. Pat dry with a clean cloth or cotton swab.
- Wash the skin around the neck with a mild soap. Rinse well and dry.
- Every day as you clean the area, check the skin around the stoma for redness, drainage, rash, dampness or unusual smell.
- Powders are not to be used on the skin.
- Apply ointment, if prescribed by the doctor, in a thin layer to treat irritations or rashes.
- Your child's doctor may prescribe a trach dressing, also called a gauze or IV sponge, to absorb moisture. If so, change it when soiled or wet. This will help prevent bacteria from growing and avoid irritation around the stoma. Another type of dressing may be ordered by your provider.

# Changing the trach holder

If the trach tube is held in place with Velcro® strips or twill tapes, change them daily. (If you use a beaded chain, refer to that section.) The tightness of the trach tie or holders is checked at the center back of the neck. One finger should fit tightly under the ties or holder. Reasons to adjust the fit may be:

- holder is loose or tight (it should fit snugly with the neck if bent forward — neck size can change with changes in body fluids or growth)
- holder gets wet or dirty
- a knot is making a pressure spot (reddened area) on the child's skin

Get someone to help. This task is safer if one person positions the child and holds the tube in place while another person changes the holder.

- Prepare the work area.
- Clean your hands well.
- Gather supplies:
  - bandage scissors
  - blanket roll to put under shoulders
  - blanket for swaddling (for infants)
  - for twill tapes: fresh tape, tweezers, and household tape such as Scotch® tape
  - for Velcro® strips: clean strips

## **VELCRO STRIPS OR TWILL TAPES:**

- Place a blanket under your child's shoulders to expose the trach area. Swaddle with a blanket if needed to prevent wiggling.
- Suction if needed.
- One person holds the trach tube by the flange.
- Second person takes off the old Velcro strip or twill tapes.
- Put on the new Velcro strip or twill tapes, secure it and check tightness (a little finger should easily slip under it).
- Velcro strips can stretch. If they get loose, hold the flange securely and tighten them.

## BEADED CHAINS:

Another holder style is the beaded chain made of stainless steel. The home care supply company will provide it, and it will need to be cut to fit your child. Keep a length of chain with the extra trach tube, ready to use, so you will always have a clean one. **Note: Daily checks on tightness of beaded chain should be performed during trach care.** The chain's advantages include:

- easy to keep clean
- needs changing less often
- does not trap moisture against the skin

**Note:** Keep a wire cutter in your travel/emergency kit in case you need to cut the chain quickly.

## Cleaning the chain

Whenever you clean the trach site, clean the chain too. Dip a clean cotton swab in the stoma cleaning solution and run it under the chain. Rinse and wipe dry.

Whenever you change the trach tube, use a clean chain. After the tube change, wash the used chain with soap and water and let it air-dry. Keep it with the extra trach tube.

Note: if reusing, re-evaluate that the chain is the proper length before using.

## Changing the chain

Whenever you change the trach tube, replace the used chain with a clean one.

Note: The chain should be sized every change.

- Before removing the trach tube chain, notice which side the clasp is on. You will thread the new chain so the clasp falls on the opposite side of the neck, reducing skin irritation.
- After changing the trach tube put the chain through the hole in the flange of the trach tube.
- Bring the chain around the back of the neck.
- Thread it through the hole in the flange on the other side of the trach tube.
- Connect the chain with the clasp. If there is not enough slack to clasp it shut, measure a longer length of chain. A chain that is too tight will irritate the skin. **Note: To avoid pinching, wrap a small piece of tape around the clasp.**

## Cutting a new chain

As your child's neck grows, the chain may tighten. Follow these steps to fit and cut a new one.

Do not measure the used chain against the new one.

- Measure the distance around your child's neck.
- Measure a length of chain to about double that size.
- Attach the chain to the trach tube.
- Adjust the chain just snugly enough that you can easily slip your little finger under it.
- Cut the chain at the correct length.
- Attach the clasp on the two ends to hold them together.

# Changing the trach tube

Change the trach tube as often as recommended by your doctor. Reuse of the trach tube is recommended by manufacturer and determined by insurance; after five cleaning cycles. You should change trach tube between scheduled dates if:

- you have trouble inserting the suction catheter
- whistling through the trach is not relieved by suctioning
- the child is distressed and does not respond to suctioning or usual calming methods

For a planned tube change, schedule it before a feeding or at least 2 hours after feeding. Get another person to help. (This is a two-person procedure, except in an emergency.)

- Prepare the work area.
- Clean your hands well.
- Gather supplies:
  - bandage scissors
  - blanket for swaddling (if necessary)
  - blanket roll to put under shoulders
  - normal saline or sterile lubricant jelly, for lubrication
  - resuscitation bags with a face mask
  - suction catheter kit
  - suction machine
  - trach holder
  - 2 trach tubes with obturators (same size and ½ size smaller)
  - tweezers
- Verify that the trach cuff is functioning properly by inflating the trach cuff and looking for any leaks. If the cuff has a leak, dispose of the tube and use a new one. Be sure to fully deflate the cuff before insertion.
- If your child is on oxygen, you may need to give extra oxygen now.
- Put the obturator into the trach tube. The obturator makes it easier to guide the trach tube into place and prevents damage to the trachea. Keep the tube in a clean and handy place until you are ready to insert it.
- Lubricate the tip of the clean trach tube with lubricant.
- Place the blanket roll under your child's shoulders to expose the neck area. Swaddle with a blanket if needed to prevent wiggling.
- Suction if needed before changing the trach.
- Person #1: Hold the trach tube. Person #2: Remove the holder (and deflate the cuff if trach tube has one).
- Person #1: While your child breathes out, remove the old trach tube following the tube's curve, using an up-and-down motion.



- Person #2: While your child breathes in, insert the clean tube gently, following the tube's curve. Direct the tube back and down.



- Hold the tube in place with your fingers while removing the obturator. **The child cannot breathe unless the obturator is removed.** Save the obturator.
- Wait a few seconds until your child is calm, supporting the trach tube with your fingers. Give oxygen if needed.
- Person #1: Inflate the cuff, if the trach tube has one.
- Then secure the tube snugly in place with the holder.

Changing the trach tube may be uncomfortable or scary for your child, but it should not cause pain. Try talking softly and holding your child to comfort and calm them. A pacifier may be helpful for a baby.

If you cannot get the trach tube in:

- Stay calm.
- If the tube does not go in, reposition your child's head, lubricate the tube and try again.
- If you are still not able to insert the tube, try to put the smaller tube in.
- If the above steps do not work, give breaths with the resuscitation bag and mask over the mouth and nose while you cover the stoma with clean gauze. Never use the resuscitation bag on the stoma without the trach tube in place.
- Call 911.

# Cleaning the trach tube

If your child has a Bivona tube, follow these steps. For any other type of tube, follow the manufacturer's directions.

- Gather equipment
  - mild oil-free soap (Ivory®, Dreft® or another brand)
  - small basin
- Soak it and the obturator in a basin of soapy water for 20 minutes. Use cotton swabs to remove any mucus if needed.
- Rinse well.
- Boil trach tube and obturator in a pan with water for 10 minutes. Let cool to a comfortable temperature.
- Air-dry on a clean towel.
- When completely dry, reassemble if necessary.
- Store in a closed container.
- Make a hash mark on the neck plate with a permanent marker after each processing to track number of uses.

Keep the trach tube in a designated place, usually by the child's bed. It should always be easy to find in an emergency. A trach tube that is the next smaller size (with holder attached) should also be in the same place. This is for backup if you cannot insert the regular size trach tube.

Inspect all trach tubes between uses. Test cuffed trach tubes for leaks after each cleaning cycle. Throw away any tube that is worn, cracked or flawed. Manufacturer recommendation is to only reuse the trach tube for five times.

# Providing humidity

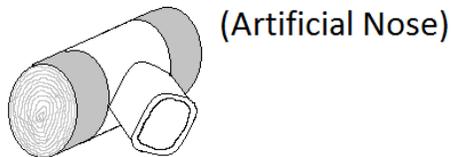
A child's windpipe is small and easily plugged with mucus. A humidity system will be used to warm and moisten the air your child breathes. Your home equipment company will set this to be body temperature and humidity. This device is referred to as a heated trach collar. This makes the mucus thin and moist, so your child can cough it up or you can easily suction it.

If your child is not on a ventilator, use the trach collar and heated humidity during naps and at night to keep the trachea moist and to prevent mucus plugs.

Water that develops in the tubing should not be drained back into the heater pot. Follow the cleaning instructions given by your equipment provider.

You may be able to use a humidifying filter (artificial nose) if prescribed by your child's doctor. An artificial nose is placed directly on the trach so your child can be free of the humidity system at times. Use the artificial nose no longer than 8 hours per day. Replace it after 24 hours or as needed if it gets wet or if mucus has collected in it. Write time and date of first use on the nose. Follow the manufacturer instructions for the care of the artificial nose.

## **Portex Heat Moisture Exchanger**



The health care team will help you decide when to use different types of humidity and for how long. You may need to increase the amount of time on humidity during winter months or in drier climates.

If the humidity system is not available (such as during long trips or power failure), use the artificial nose.

If mucus becomes thick, contact your home care equipment company to adjust humidity temperature within safety guidelines. Check with your child's doctor to see if you should give your child more fluids to help the mucus thin. You may need to increase your child's length of time on humidity.

# Home medical equipment

Your doctor may prescribe some of this equipment for your child at home. Keep it clean and in good working order, following the equipment provider's instructions.

**Speaking aides:** Your child may be prescribed a special valve that attaches to the trach tube to aide your child's speech and swallow development. **If your child has a cuffed trach tube, the cuff MUST always be deflated prior to placement of the speaking valve.** The initial use of this valve often occurs with assistance of a speech therapist.

**Apnea monitor:** counts your child's heart rate and breathing rate and alert you if your child is having trouble breathing. Use it whenever you are not directly watching your child.

**Humidity system:** provides moisture to your child's trach to keep the mucus thin and moist.

**Nebulizer:** gives medicine as a fine mist that is breathed into the lungs.

**Meter dose inhaler and spacer:** delivers inhaled medicine into the lungs.

**Oxygen:** some children may need to use oxygen all the time, others only sometimes.

## OXYGEN SAFETY AT HOME

Safety and use will be reviewed with you by your home care company.

## What else do I need to know?

If you think there is a problem with your oxygen system, do not try to fix it. Call your equipment company for help.

**Oxygen saturation monitor (oximeter):** monitors the oxygen saturation level in your child's body.

**Portable suction machine:** helps keep child's lungs free of excess mucus.

**Assisted breathing machines (ventilator, BIPAP, CPAP):** if your child needs the help of a breathing machine, your home care provider will cover this with you in more detail.

**Resuscitation bag:** used when child has trouble breathing or there is a problem with the breathing machine. There are two sizes of bags, and several mask sizes. The correct size will be ordered for you, and you will be shown how to use it. As your child grows, a different size mask is needed. The mask should fit from the chin to the bridge of the nose.

The bag is self-inflating: lightly attach the bag to the trach tube, and squeeze until the chest rises. It can be used with oxygen or room air. Keep the bag and attachments close to your child at all times, ready to use. Note: If you use the mask over the nose and mouth, lightly cover the stoma to prevent air from escaping. Never bag with the mask over the stoma.

\*This equipment should be checked every day to assure it is working correctly.

\*If your child is on a breathing machine, there will be a peep valve on the bag. This will be set as prescribed by your child's doctor.

# Travel/emergency kit

You'll need two travel/emergency kits, one by your child's bed, and one to take with you everywhere you take your child. Be sure to check the travel kit supplies before you leave home. Replace any used supplies when you return home so it is always ready to go.

- resuscitation bag, mask (and trach adapter if metal tube)
- CPR and obstructed tube instructions
- bandage scissors, or wire cutters if beaded chain is used
- bulb syringe — for one-time shallow suctioning if no power is available
- De Lee® suction catheter
- emergency phone numbers
- gloves
- sterile normal saline jets
- oxygen if needed
- portable suction machine
- sterile suction catheter kits
- sterile water
- tissues
- extra trach holder
- two clean trach tubes with holder attached and obturator in place (same size and next size smaller)
- tweezers or forceps
- wipes or hand sanitizer
- humidifying filter (HME)

Travel with your child is possible. Arrangements will need to be made by your home equipment company and your child's doctor.

# Assessing your child's health

- Check the color of the gums and lips.
  - The normal color of the gums and lips is pink. Know your child's normal color. If the color changes from normal to grayish or bluish, and you have suctioned the trach, this means your child needs oxygen.
- Assess the breathing sounds.
  - **Without stethoscope** : is there equal chest rise? How is your child's color? Can you hear and/or feel anything abnormal with your child's chest?
  - **With stethoscope**: Does your child's chest sound like it normally does? Can you hear air move in and out of the lungs?
- Check the mucus for changes
  - An increased amount of mucus means your child needs suctioning more often.
  - Thick mucus may mean your child needs more humidity or more liquids to drink. Secretions should be thin enough to be easily suctioned with the catheter.
  - Know your child's normal mucus color and smell. Call the doctor if mucus color or smell changes. If mucus becomes red or blood-tinged, call the doctor right away. Sometimes this can be caused by irritation from the suction catheter.
- If sick, measure body temperature
  - Normal body temperature is 97.6°F (rectal). A fever is an increase in temperature to about 99.5°F under the arm, or about 100.5°F rectally. A fever usually means there is some type of infection. A fever will often make the pulse and breathing rate increase.

# Problem-solving

## What are the signs of breathing problems?

- child seems agitated and restless, is sweating, or cries and cannot be comforted
- increase in breathing rate
- flaring nostrils
- retracting (chest or neck skin pulls in with each breath)
- dusky color lips or on the sides of nose
- nail beds are blue or dusky
- child just does not look right

## What should I do for breathing problems?

- Suction
- Give breaths with the resuscitation bag
- Give oxygen if you have it
- Repeat suction with lavage
- Change the trach tube
- Call your child's doctor (phone: \_\_\_\_\_) or call **911**
- Follow doctor's advice

## What should I do if the trach tube comes out?

- Insert a clean tube with obturator.
- If a clean tube is not handy, insert the same tube that came out using the obturator.  
Do not waste time looking for a clean tube!
- If you cannot find the trach tube, stay calm. The stoma may stay open and the child may be able to breathe for a short time.
- Then get the travel/emergency kit and insert the clean trach tube.
- If you cannot find a clean trach tube, or if you cannot insert it, **call 911**.

## What do I do if my child stops breathing?

- Begin CPR. Call 911

## What do I do if the tube becomes plugged?

- Do obstructed tube procedure.

## When should I call the doctor?

- redness, skin breakdown or rashes around the stoma
- fever (temperature higher than 100.5°F rectally or 99.5°F under the arm)
- signs of dehydration (getting dried out)
- no urine (or wet diaper) for 8 hours
- urine darker in color than normal
- urine smell is stronger than normal
- mucus is yellow, green, red or blood-tinged, or develops a smell
- any change from usual mucus color or smell
- any breathing problems that does not get better after suctioning
- any questions or concerns

### **Call 911 if:**

- bleeding more than a little from the trach — Do not remove the trach tube. Suction often until trained help takes over.
- child stops breathing.
- child goes unconscious.
- you feel you cannot handle the situation.
- you have to do CPR.
- you have to do an emergency trach change and are concerned about it.

# General care

## Feeding

Many children with trachs can be fed the same as any other child of the same age. It is important that you feed and interact with your child as normally as possible. The senses of taste and smell are somewhat reduced by the presence of a trach tube, since air does not pass through the mouth and nose. However, you should respond to your child's preferences for tastes as you would any child.

Make sure your child has enough to drink every day, to keep mucus thin so it does not block the trach tube. If your child gets sick, give extra fluids to prevent dehydration (getting dried out).

If your child vomits and you think vomit has gone down the trach tube, suction the trach tube. If at any time you are concerned that your child is having trouble swallowing, is coughing or choking during meals or pulls back suddenly from the nipple or spoon, or has a fever for unknown reason, call the doctor. If your child coughs and has trouble breathing, call the doctor.

## Feeding an infant

- Do not prop the bottle.
- Do not let the baby have a bottle unless you are present, in case choking occurs. If your baby spits up or vomits, turn to the side and wipe out the mouth.
- Use cloth bibs. Never use a plastic bib over the trach. Your child cannot breathe through a plastic bib.
- Burp baby well after feedings.

## Feeding an older child

If your child is likely to spill food, place a cloth bib over the trach. Never use a plastic bib over the trach. Your child cannot breathe through a plastic bib.

If choking or vomiting occurs, hold your child with the head down or turned to the side.

## Mouth care

It is important to keep your child's mouth clean and healthy. Begin brushing teeth and routine check-ups with a dentist as you would for a child without a trach.

## Bathing

You child can be bathed in a tub, but do not let water get into the trach. Use the artificial nose to help keep droplets of soap and water out of the trach. The artificial nose should not get wet. When shampooing the hair, tip the head back and pour water over the hair. Do not let the artificial nose on the trach go under water.

## Clothing and bedding

You do not need to buy special clothing for your child. Clothing should not cover the trach. Avoid necklaces, strings, fuzzy clothing, fuzzy blankets, and stuffed animals. Tiny beads or fibers from these articles can get into the trach. Clothing that opens in the front works best.

## **Making sounds and talking**

At first your child will not be able to make sounds. This is because the air from the lungs does not pass through the vocal cords but comes out of the trach tube instead. As your child's airway grows, some air may begin to leak up around the trach tube through the vocal cords. At first these sounds may sound like little squeaks. Your child may soon be able to coo, babble, or talk with the tracheostomy tube in place.

Some children may be able to use a speaking valve on their trach. This valve allows the child to breathe in through the trach. When air is exhaled, the valve closes and the air goes around the trace tube, up through the airway and vocal cords, and out of the nose and mouth. There are many things to consider in deciding if your child can try one of these valves. Ask your child's doctor if and when your child may be ready. Following a doctor's order, a pediatric speech-language pathologist trained in the use of speaking valves can help decide whether or not your child can use one. Although children may learn to block the trach opening with their finger or chin to talk, a speaking valve is preferred because it is safer and cleaner.

Note: If you child's trach tube has a cuff, remember to deflate it when using the speaking valve.

Language stimulation is very important. Remember, your child can hear you even if he or she cannot talk to you. It is important that you talk, read stories and name pictures, as you would with any other child. If your child cannot make sounds or practice speech, there is a risk of speech and language delays. A speech-language pathologist can show you ways to work with your child to prevent delays in the development of speech and language skills.

You may keep a paper and pencil near to help the older child communicate, especially if the trach is short term. For children needing a trach for a long period of time, there are many electronic devices on the market with synthetic or digitized speech, which can "talk" for your child. A speech-language pathologist who specialized in "augmentative communication" devices can help decide when your child is ready.

## **Babysitters**

A child with a trach needs to be watched closely around the clock. The hospital staff and home care nurses can help you teach other caregivers how to care for your child. All caregivers should be trained in trach care, equipment use and CPR. It is important that parents be able to rest and go out.

## **Weather**

Protect the trach with an artificial nose anytime your child is away from home.

When the temperature is below freezing (32°F), avoid allowing your child to breathe cold air directly into the trach. This can cause trouble breathing if exposed for long periods of time. Keep a baby's head and neck loosely covered with a blanket. Tie a lint-free scarf around the neck of an older child.

## **Siblings**

It is important to help other children in the family understand why and how the child breathes through a trach. This can be a frightening situation for brothers and sisters, and requires your support and teaching to ease their discomfort. It may be helpful to involve them in small tasks such as getting things or helping clean equipment. Be sure to watch brothers and sisters around the child so they do not put anything into the trach.

## **Safety tips**

- A portable intercom system will help you hear your child when you are in another room.
- Keep fine-haired pets, such as cats and dogs, away from the bedroom or living space of the child with a trach tube.
- Keep your home as free from lint and dust as possible.
- Keep a smoke-free home: no cigarettes, pipes, fireplaces or wood-burning stoves. Smoke irritates children's lungs and makes colds more likely.
- Do not use powders, chlorine bleach, ammonia or aerosol sprays in the same room as the child. Particles and fumes can cause a "burning feeling" and breathing problems.
- Do not use a plastic bib when feeding, only a cloth bib.
- Children with a trach should avoid contact sports such as football or soccer.
- Watch child's play closely so that toys, fingers and food are not put into the trach tube.
- Watch child closely around water. Extreme caution must be taken to avoid getting water into the trach.
- No swimming or sandbox play.
- Do not buy toys with removable small parts.
- Always carry the travel/emergency kit when you and your child leave home.
- Keep trach supplies in a labeled container.
- Keep child's trach related medical records together for easy transport in an emergency.

# CPR

CPR stands for cardiopulmonary resuscitation.

**C** = cardiac (heart)

**P** = pulmonary (lungs)

**R** = resuscitation (to recover)

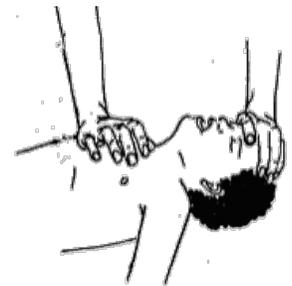
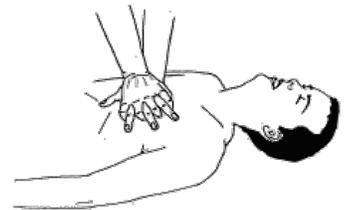
## Check for response

- Support the head and neck, and turn the person so he or she lays flat, face-up, on a hard surface.
- Tap and shout, "Are you okay?"
- If no response, yell, "HELP!"
- If someone comes, send person to call 911 and get automatic external defibrillator (AED) if available.
- If you are alone, call 911; with infants and children, begin two minutes of CPR before calling. Get AED if available.
- Check for no breathing or no normal breathing (gaspings is not considered normal breathing) for 5 to 10 seconds.
- Quickly open chest clothing.



## Chest pushes (compressions):

- Adult (puberty and older):
  - Put the heel of one hand between the nipples on the breastbone.
  - Put the other hand over the first, keeping your fingers off the chest and your elbows straight.
- Child (1 year to puberty)
  - Put the heel of one hand between the nipples on the breastbone. (Put other hand on top if needed)
- Infant (up to 1 year)
  - Put 2 fingers on the breastbone, just below the nipple line. (Make sure your fingers are not on the bottom end of the breastbone.)
  - Push hard and fast:
    - Push straight down
    - 2 inches deep for child or adult
    - 1/3 the depth of the chest (about 1 ½ inches) in infants
    - 30 pushes at a rate of at least 100 per minute
    - Let chest come up after each push
  - Use AED as soon as it is available



## Airway

- Get resuscitation bag.
- Tilt head back to access trach.

## Breathing

Give two breaths with resuscitation bag attached to trach tube. If chest does not rise:

- Perform obstructed tube procedure.
- Give two breaths, just enough to make the chest rise (about 1 second each).
- Continue 30 compressions and 2 breaths for 5 cycles or about 2 minutes.
- Do CPR until person is responding (starting to move), or until trained help takes over.

### If breathing but not responding:

- Stop CPR.
- Watch the breathing until trained help arrives. Assist breathing with resuscitation bag if needed.
- If no injuries, roll the person onto one side. Do not twist the head, neck, or body while rolling.
- Even if breathing and responding, the person should be taken to the nearest emergency room by ambulance.

**Important:** This sheet is a review of techniques taught in a CPR class. It is not complete in itself. You must practice these techniques on a manikin with an instructor. **Do not** practice techniques on a person.

# CPR quick reference

Check for response:

- Turn on back on hard surface
- Tap and shout, "Are you OK?"

Alert:

- Call 911 for adults; perform 2 minutes of CPR before calling 911 for infants and children. Get AED if available.
- Check for normal or no breathing. If not breathing normally, do chest pushes.
- Open chest clothing
- Chest pushes:
  - **Adult: (Puberty and older)** put the heel of 1 hand between the nipples on the breastbone. Put other hand over the first.
  - **Child: (1 yr old to puberty)** put the heel of one hand between the nipples on the breastbone. (Put other hand on top if needed.)
  - **Infant: (up to 1 year old)** put 2 fingers on breastbone, just below the nipple line. (Make sure your fingers are not on the bottom end of the breastbone.)
- Push hard and fast:
  - 2 inches deep for adult/child
  - 1/3 the depth of the chest for an infant (about 1 ½ inches)
  - 30 pushes at a rate of at least 100 per minute

Airway

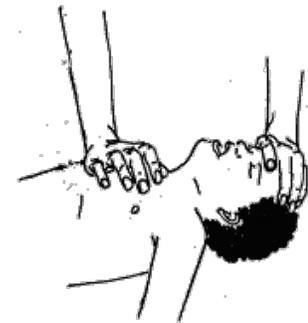
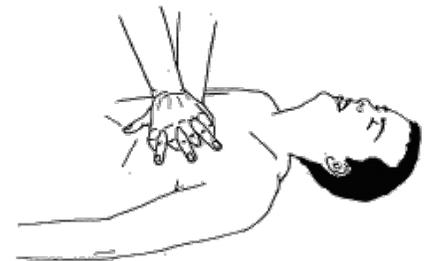
- Get resuscitation bag
- Tilt head back to access trach

Breathing

- Give 2 breaths with resuscitation bag.
- If chest rises, go to CPR.

If chest does not rise:

- Perform obstructed tube procedure.

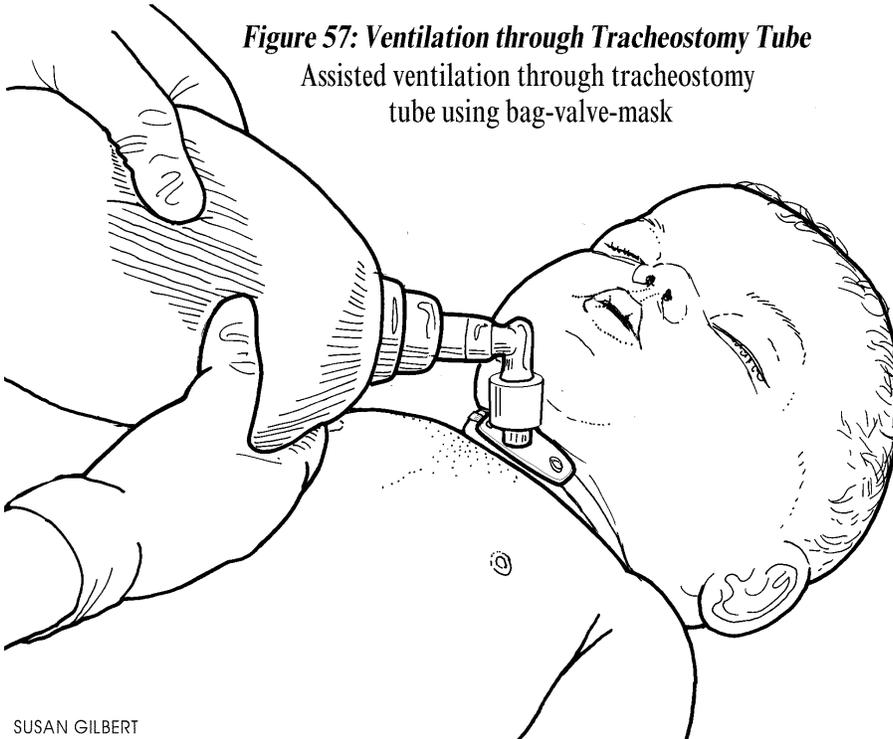


# Obstructed tube procedure

From CPR, follow this procedure until you get one breath in (chest rises). Then give another breath and back to CPR.

- Suction.
- Give breaths with bag. Look for adequate chest rise.
- Lavage with 3 mL normal saline.
- Give 4–5 vigorous and quick breaths with bag.
- Suction.
- Give breaths with bag. Look for adequate chest rise.
- Get travel/emergency kit. Change trach tube. Give breaths with bag.
- Call 911.
- Give breaths with bag. Look for adequate chest rise.
- If your child has not had tracheal diversion surgery: Try to give breaths with face mask over nose and mouth. Never use mask over stoma.
- Continue steps of CPR.

**Figure 57: Ventilation through Tracheostomy Tube**  
Assisted ventilation through tracheostomy tube using bag-valve-mask



SUSAN GILBERT

Illustration source:

The Center for Pediatric Emergency Medicine (CPEM), Teaching Resource for Instructors in Prehospital Pediatrics.

Illustration by Susan Gilbert.

# Phone numbers

Primary doctor \_\_\_\_\_

Pulmonary specialist \_\_\_\_\_

Other provider(s) \_\_\_\_\_

Equipment company \_\_\_\_\_

Home care nurse \_\_\_\_\_

Transportation services \_\_\_\_\_

Other \_\_\_\_\_

## Family Resource Center

**Minneapolis:** 612-813-6816

**St. Paul:** 651-220-6368

**Website:** [childrensmn.org](http://childrensmn.org)

Includes information about visiting Children's Minnesota, articles about illnesses and medical organizers.

## Early Childhood Family Education

Classes about raising young children. Call your local school district.

## Early Childhood Special Education

Screening and services for children with developmental delay or disability. Call your county.

For more information visit: [tracheostomy.com](http://tracheostomy.com)

Global Tracheostomy Collaborative: [globaltrach.org](http://globaltrach.org)

Pediatric Home Service: [pediatrixhomeservice.com](http://pediatrixhomeservice.com) or 800-225-7477

# Checklist

## As needed:

- Shallow suctioning
- Deep suctioning (minimum of every 8 hours)
- suction machine pressure \_\_\_\_\_
- safe suctioning depth \_\_\_\_\_

## Daily:

- trach care (twice a day)
- clean around stoma and trach neck plate
- change trach bib (IV sponge), if used. If soiled, change more often.
- clean inner cannula, if used
- empty suction canister
- add cleaning solution to suction canister
- clean trach collar, inside and out
- discard and replace artificial nose

## As often as the doctor recommends:

- change the trach tube every \_\_\_\_\_
- change trach holder every \_\_\_\_\_
- discard trach after \_\_\_\_\_

## Weekly:

- order supplies from home care provider
- check other supplies and purchase if needed
- wash surfaces of all equipment and equipment stands
- clean resuscitation bag
- throw away suction tubing

# Supply list

Keep these items on hand at home.

- bandage scissors; wire cutters if beaded chain is used
- blankets for swaddling
- bulb syringe
- prescribed stoma cleaning solution
- normal saline
- cotton swabs such as Q-Tips®
- De Lee® suction catheter
- gloves (packed by the box)
- normal saline for lavage
- ointment, if prescribed
- resuscitation bag with mask/trach adapter
- shallow suctioning device
- soap, mild and oil-free (Ivory®, Dreft®, or another brand)
- storage container, with cover, for trach tube
- suction catheter kit, size \_\_\_\_\_
- trach collar
- trach holder
- beaded chain
- twill tape
- Velcro® strips
- trach tube, brand \_\_\_\_\_, size \_\_\_\_\_
- trach tube, same brand, nest size smaller: \_\_\_\_\_
- tweezers
- water, sterile



## My child's trach information

Trach tube size (primary):	
Trach tube size (back-up):	
Trach tube size (if MRI needed)	
Trach tube length (neo, peds, adult):	
Trach tube brand:	
Suction catheter size:	
Safe suction length (see reference on page 7 to determine):	
Stoma cleaning solution:	
Cuff inflation (if applicable):	
Inner cannula type (if applicable):	
Inner cannula type (if applicable):	
Tube change frequency:	
Number of times to reuse tube:	
Emergency trach tube size:	