Tracheostomy Handbook
How to care for your child with a trach at home
Respiratory Discharge Coordinators and Tracheostomy Educators

Hours: Contact Monday through Friday 9 a.m. to 5 p.m. with questions or to schedule classes.

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# Contents

- **Tracheostomy Classes in the Hospital and Preparing for Home** ........................................... 5
- **When a Tracheostomy is Recommended for Your Child** ......................................................... 7
- **Tracheostomy Tube Position in an Infant’s Upper Airway: Illustration** ................................. 10
- **Tracheostomy Tube Position in a Child’s Upper Airway: Illustration** .................................. 11
- **Importance of Humidification with a Tracheostomy** ................................................................. 12
- **Heated Mist Collar Home Set Up** ............................................................................................. 15
- **Essential Trach/Vent Equipment for Home and the “To Go” Bag** .......................................... 17
- **Essential Equipment Checklist for Tracheostomy Patients** .................................................... 18
- **How to Check a Resuscitator Bag** .......................................................................................... 21
- **Stroller Setup for Respiratory Equipment** ............................................................................... 22
- **Suctioning with a Simple Suction Catheter** ............................................................................. 25
- **How to Clean and Reuse a Suction Catheter at Home** ............................................................ 28
- **Suctioning with a Closed (In-line) Suction Catheter** .............................................................. 30
- **Tracheostomy Stoma Care** ...................................................................................................... 33
- **Bivona TTS Trach Cuff** .......................................................................................................... 36
- **Tracheostomy Tube Change** .................................................................................................... 39
- **Bivona Trach Cleaning Steps** .................................................................................................. 43
- **Signs of Respiratory Distress in Your Infant with a Trach** ..................................................... 45
- **Signs of Respiratory Distress in Your Child with a Trach** ....................................................... 48
- **Understanding Tracheitis in Your Child with a Trach** ............................................................. 51
- **Trach/Vent Sick Day Management at Home** .......................................................................... 53
- **How to Collect a Mucus Sample at Home** ............................................................................. 55
- **Nebulizer and MDI with Spacer Treatment for a Child with a Tracheostomy** .................... 58
- **Emergency Airway Management (Conscious child with Tracheostomy)** ............................. 60
Trach Safe Quick Steps in a Trach Breathing Emergency............................................. 61
CPR for an Infant with a Tracheostomy......................................................................... 62
CPR for a Child with a Tracheostomy ........................................................................... 63
CPR for a Teen/Adult with a Tracheostomy............................................................... 64
Bag-Mask Ventilation .................................................................................................. 65
Chest Physical Therapy (CPT)...................................................................................... 67
A Look at the Lungs and Percussion Techniques....................................................... 69
Chest Physical Therapy (CPT) Infant/Modified Positions......................................... 71
Chest Physical Therapy Standard Positions............................................................... 72
Tracheostomy Glossary............................................................................................... 74
Notes............................................................................................................................. 78
Tracheostomy Classes in the Hospital and Preparing for Home

Children with tracheostomy tubes require special care. Before your child leaves the hospital, Respiratory Discharge will teach you how to care for your child with a trach at home.

We will set up the training schedule after your child:
☐ Had their first trach change by OTO doctors
☐ Is medically stable
☐ Is on home care equipment
☐ Had a transition care conference to transfer care from the ICU to your new medical team
☐ Has moved from the ICU to the medical floor

Trach class information

- Once home, your child must be in the care of a fully trained adult caregiver at all times. We recommend that 2 to 4 people be trained. Please choose adult family members or close friends. We want everyone to train at the same time so it will not delay your child's discharge from the hospital.
- Classes are normally scheduled from 10 a.m. to 12 p.m. and 2 p.m. to 4 p.m. during the weekdays. This class time is one-on-one training with just your family's caregivers.
- Each class is 2 hours, 2 to 3 times per week.
- If your child has a trach only, you will need about 14 hours of training – that's seven 2-hour sessions.
- If your child has a trach and needs a ventilator to help them breathe, you will need about 28 hours of training – that's fourteen 2-hour sessions.
- If you need to reschedule your class for any reason, call Respiratory Discharge at 206-987-2258. Leave a message and we will return your call. We may be able to fit another family into this time and we will reschedule your class.
- Classes happen both in a training room and at the bedside working directly with your child.
- Please plan to turn off your cell phones during class.
- Brothers and sisters cannot be in the room with you during class. Please make childcare arrangements for siblings. If you need childcare, we will request a Child Life volunteer ahead of time to care for the sibling during your classes.
- Once you have completed all of your classes, you will practice these skills with staff until you become confident and comfortable.
• Before your child is ready to leave the hospital, you will need to do a rooming-in trial. This is where each caregiver will spend 24 to 72 hours in the hospital doing all of your child’s care. Your bedside nurse will go over the expectations and instructions of the rooming-in trial. Nurses and respiratory therapists will be on hand if questions arise.

**Discharge planning and home care coordination**

• We will help you choose a durable medical equipment (DME) company that will supply the respiratory equipment, trachs and supplies that you will need for home.

• A nurse care coordinator will be working with you to choose a nursing agency in your area. Once you have chosen an agency, the nurse care coordinator will work with you to set up interviews with potential home nurses, and guide you through the process of staffing at home.

**Steps to going home – my checklist**

I will be ready to take my child home after completing some important tasks during my hospital stay. Many of these steps are part of the Trach Road Map.

☐ 1. My child had their first trach change by OTO doctors.

☐ 2. My child is medically stable on home equipment.

☐ 3. I had a transition care conference to transfer care from the ICU to my child’s new medical team.

☐ 4. I received a Tracheostomy Care Notebook with the Trach Road Map from my nurse care coordinator.

☐ 5. My child moved from the ICU to the medical floor.

☐ 6. RT Discharge met with me to set a trach training schedule and has given each caregiver a Tracheostomy Handbook.

☐ 7. I have started attending trach classes and watching assigned videos.

☐ 8. My durable medical equipment (DME) company and the home nursing agency have been chosen.

☐ 9. The portable equipment has been delivered and taught to my family caregivers.

☐ 10. My child had a Trach Safe airway evaluation.

☐ 11. My family caregivers have completed training.

☐ 12. Family caregivers have successfully completed our rooming-in trial.

☐ 13. The equipment and supplies are set up at home and my family is fully trained by the durable medical equipment (DME) company.

☐ 14. The PSO (Patient Specific Orientation) is set with the home care nurses.

This is an overview of my child’s care needs for home.
When a Tracheostomy is Recommended for your Child

What is a tracheostomy?
A tracheostomy is a surgically made hole in the front of your child’s neck which creates an opening into the trachea (windpipe). This hole is called a tracheostomy stoma.

What is a tracheostomy tube (trach tube)?
A trach tube is a curved plastic or silicone hollow tube that is put in through the stoma and into the windpipe. Your child will breathe in and out through this breathing tube.

A tracheostomy is a surgically created airway. Your child may need a tracheostomy to bypass a blockage of their upper airway. They may need a trach to be more safely connected to a breathing support device (ventilator) outside of the ICU or at home.
How is the decision made to place a trach in my child?

Your child's doctors have recommended a tracheostomy. Common reasons a child needs a trach are when they:

- Cannot breathe because of blockage in the upper airway.
- Need help keeping their lungs and airways clear of mucus.
- Need a ventilator to help with breathing for a long period of time.

Your team will schedule a meeting called a care conference. At this important time, your provider will talk with you about why your child needs a trach tube and how long they anticipate your child's needing it. The specialists likely involved in the discussion include:

- The otolaryngology surgeon - an airway specialist who will do the tracheostomy surgery and help care for the trach tube long-term.
- The pulmonary doctor - a lung and breathing specialist who provides the long-term care to children who need a ventilator to help them breathe.
- The craniofacial doctor - the head shape and airway specialist who provides long-term care to children who have facial differences.
- The critical care doctor or neonatologist – the person who leads a child’s care if they are in the ICU.

Before your child has a tracheostomy surgery, it is very important to us that you understand specifically how it will help your child.

What should I expect right after surgery?

Your child’s otolaryngology surgeon will place the correct size and type of trach tube during surgery. The new trach tube will be stitched into place for about 7 days to allow the stoma to heal properly. The tracheostomy stoma is not very painful, but your child may be given sedation medicines to treat the pain and keep them comfortable, if needed. Many children will be on a ventilator (a machine that helps them breathe) after the surgery.

Often, the first trach tube has a cuff. The cuff is an inflatable area near the end of the trach tube. The cuff is used to help direct the breaths from the ventilator to your child’s lungs. After 7 days, the surgeon will remove the stitches and do the first trach change.

Where will my child go after surgery?

Your child will stay in the intensive care unit (ICU) until they are ready to be transferred to the medical floor. Before they can be moved from the ICU your child will need to have their first trach change, be medically stable and be set up and using their home equipment, including a home ventilator if necessary. It can sometimes take weeks after a trach tube is placed before your child is ready to leave the ICU. Before the transfer to the medical unit, you will have
another care conference to make sure that the transition to the new floor and new care team goes smoothly. This will be a great opportunity to meet the new team and ask questions.

**How will I learn to care for my child with a tracheostomy?**

Our goal is for your child to go home with you after they are medically ready and you have learned how to care for them with a tracheostomy. There are many tasks for you to learn to keep your child safe and healthy with a tracheostomy. We understand being told your child needs a trach involves a lot of adjustment for you and your child. Your child's care team including Child Life and Social Work will support you all throughout this time. Our respiratory discharge educators will meet with you to set up a training schedule when your child is medically ready for training to begin. While your child is in the ICU you can watch all 6 of the trach videos anytime on the Get Well Network in your child’s room. We will give each one of our family caregivers a Tracheostomy Handbook with all of our handouts that we use during our trainings. We also have loaner trach dolls for you to take home for more practice.

Your child will have several types of medical equipment in the home, including oxygen and oxygen monitors, suction machines for keeping the airway clear, and a ventilator (if necessary). Children with a tracheostomy must have an awake, trained caregiver with them 24 hours a day, which means that they qualify for nursing in the home. Our care coordinators will meet with you to discuss how we will work to get these things started around the time of the tracheostomy surgery.
Tracheostomy Tube Position in an Infant’s Upper Airway: Illustration

- Pharynx
- Epiglottis
- Vocal cords
- Esophagus
- Trachea
- Bronchi
- Nasal cavity
- Tongue
- Larynx
- Stoma
- Tracheostomy tube
- Trach cuff
- Carina
- Pilot balloon
Tracheostomy Tube Position in a Child’s Upper Airway: Illustration
The Importance of Humidification with a Tracheostomy

Breathing with a trach tube
When your child has a trach tube, they breathe all their air in and out through this artificial tube. The air they breathe bypasses the body’s natural way to warm, humidify and filter the air – the nose.

How do the lungs naturally clean the air we breathe?
The inside of the nasal cavity and the trachea and down through the bronchi are lined with cells that produces a layer of mucus. This mucus layer traps dust and any particles that we breathe in. Special hair-like structures in the mucus layer, called cilia, sweep constantly to move the mucus up to the end of the trach tube. (see picture on right below.) This mucus is then coughed up and spit out or swallowed.

How do I keep my child’s mucus clear with a trach in place?
You will need to remove the mucus your child is unable to clear by their own effort. The mucus must be coughed or suctioned out of the airways. Thin mucus is easier to cough out of the lungs. The airway needs to have good humidification (moisture) and warmth to keep this layer of mucus thin and allow the cilia to function properly.

Keeping moisture or humidification in the trach tube
Humidification is really about doing what the nose normally does - keeping moisture in the air you breathe in. If the air is warm and moist, the mucus will be thin and easier to manage. If the air is dry, it will dry out the mucus in the lungs and the trach tube. Thick mucus can block the trach tube. There are several ways to add humidification (moisture) to your child’s trach before the air reaches their lungs.
Types of humidification

Heated mist collar

The heated mist collar is the best source of warm, humidified air for children with a simple trach tube (see set up at left). It uses an air compressor to push air through tubing and over the warm water in the heated humidifier chamber. As the air flows over the heated water, it picks up moisture as it travels through the tubing into the trach mask and into your child’s trach. This will keep the mucus thin and easier for your child to cough and clear out, or for the caregiver to suction.

Care tips

- The trach mask fits loosely over the trach tube and has an elastic adjustable strap that fits behind the neck. Make sure to keep the mask over the trach tube to direct the warm moisturized air to the trach tube. Do not overtighten the elastic strap. This will cause discomfort and skin breakdown for your child.

- Check the level of sterile water in the humidifier chamber and water bag often to make sure that it does not run out of water. Hot, dry air will cause the mucus to thicken and increases the chance of plugging.

- Check the tubing to make sure that it is warm to the touch and you can see condensation droplets on the inside of the tubing.

How often to use

When your child first gets the trach, they will need to be on the heated mist collar most of the time. After a while, they may need to only use it during sleep, naps and illness. When your child’s mucus becomes thick, you may need to increase the amount of time they spend on the heated mist collar.

If your child is using a ventilator, the same heated humidifier system is used as part of the circuit to provide warmth and humidification to the airway.
Heat moisture exchanger (HME) – the “nose”

An HME is a small “nose-like” piece of plastic with a paper filter that fits over the trach opening. Each end of the HME is made up of rows and rows of thin filter paper. The HME helps with humidification by trapping some of the warm moist air when your child breathes out through their trach. When your child breathes back in, the air passes through the HME and picks up the moisture from the filter paper.

Care tips

- The HME is a disposable, one-use-only product. If the HME becomes wet with secretions or plugged, throw it away and replace it with a new one.
- Start each day with a new HME and remember to throw away any used HME's at the end of each day.
- You can add more moisture by adding 2 to 3 drops of normal saline drops directly to the trach tube every 15 to 30 minutes and then adjust to your child's needs.
- HME's are used during the day when your child is awake and if the secretions are thin. While asleep or when the secretions are thick, it's best to use the heated mist collar to decrease the risk of airway plugging.

How often to use

- When you first start using an HME, remember to start with a short time to see if your child tolerates it. Using an HME for bath time is a good place to start. Remember to increase the time slowly.
- Your child will need to use the HME to go portable and for activity times.

Capping

A cap is a small plastic cover that is placed at the end of the trach tube. Capping is an order from your doctor and it is only done if your child can breathe in and out without distress through their nose or mouth. Through capping, humidification is supplied by the child's own body. No outside source of moisture is needed. Capping is normally done as a trial to make sure they are ready to have the trach out for good. It is also done when a child only needs to use a ventilator or breathing machine such as CPAP or BiPAP for sleep at night.

The airway must be checked by Otolaryngology (Ear Nose and Throat or ENT) before the trial to confirm that it is clear of any obstructions. ENT might schedule a Trach Safe evaluation (a special camera used to inspect the airway). After the airway evaluation, your doctor and respiratory therapist will do a capping trial to make sure that your child is able to breathe comfortably through their nose or mouth and around the capped trach tube in their airway. Because your child will be using their upper airway to breathe in, the air will be warmed, humidified and filtered naturally by the nose.
Heated Mist Collar Home Set-Up

Parts list with part/model numbers
- Trach collar (mask) #310001
- Sterile water 1 liter bag #450030
- IV Pole #8000000
- Temperature probe #450040
- Humidification chamber #2310030, #450043
- Humidifier MR-850 #450039
- Heated wire circuit - #360305
- Green bubble tubing #300016
- Adapter - concha nipple #450017
- Adapter - O2 bleed-in, #320010
- Adapter - blue flexible #320001
- Air compressor: PM-15 #430060
- Oxygen concentrator, Everflo #400066
Connections

To oxygen concentrator
Adapter - blue flexible
Adapter - O2 bleed-in
Heated wire circuit pigtail connector
Temperature probe wire
Temperature probe

To air compressor
Adapter - Concha nipple

Temperature probe
Heated wire circuit pigtail connector
Essential Trach/Vent Equipment for Home and the “To Go” bag

The essential equipment must be with your child at all times. Use this list to check and restock the essential equipment and supplies daily and before your child leaves the house with their “To Go” bag. You will need 2 adults when you take your child in your car. One must be a fully trained caregiver and sit next to the child and the other adult drives the car.

**Essential Trach Equipment and Supplies**

- Trach tube the same size as your child's
- Trach tube one size smaller (emergency trach)
- Sterile lubricant
- Trach ties, blunt scissors and stoma care supplies
- Syringe for cuffed trach and sterile water
- Portable suction, fully charged, with AC + DC power cords
- Suction catheters (closed, simple, oral, nose) and saline packets
- Shoulder roll
- Gloves and hand sanitizer
- Oximeter, fully charged, with AC power cord
- Oximeter cable and disposable probes
- Oxygen tank (check the amount of gas in the tank)
- Resuscitator bag (check daily)
- Resuscitator bag face mask and stoma mask
- Heat moisture exchanger (HME)
- Letter with medical history, doctor’s contact information and emergency numbers
- Cough assist if ordered
- Oral airway if ordered

**Essential Vent Equipment and Supplies**

- Ventilator with AC + DC power cords
- Fully charged batteries (internal, detachable and external)
- Battery cables and car adaptor
- An extra complete prebuilt ventilator circuit with oxygen tubing

Consider using a backpack, travel bag, toiletry bag or an organizer for your child's “To-Go” bag. Choose the best option for your child's needs.
## Essential Equipment Checklist for Tracheostomy Patients

### Portable Suction

1. ☐ Portable suction machine (fully charged)
2. ☐ AC/DC power cord
3. ☐ Open suction catheters
4. ☐ Inline suction catheters
5. ☐ Oral suction
6. ☐ Saline
7. ☐ Gloves
8. ☐ Hand sanitizer

### Trach Tube

1. ☐ Trach tube (same size)
2. ☐ Trach tube (one size smaller)
3. ☐ Blunt scissors
4. ☐ Syringe (cuffed tube only)
5. ☐ Sterile lubricant
6. ☐ Trach ties
7. ☐ HMEs
8. ☐ Sterile water
9. ☐ Shoulder roll
10. ☐ Oral airway (if needed)
**Oximeter**

1. Oximeter (fully charged)
2. Power cord
3. Cable
4. Probe

**Resuscitator Bag**

1. Resuscitator bag with oxygen tubing
2. Face mask or stoma mask
3. Oxygen tank

**Documentation**

- Letter with medical history and instructions to call a doctor in an emergency

**Cough Assist**

1. Cough assist
2. Cough assist tubing
   - Oxygen tubing
3. AC power cord
4. Suctioning supplies (see page 18)
### Ventilator Supplies

1. □ HMEs
2. □ Oxygen tubing

### Trilogy Ventilator

1. □ Trilogy ventilator
2. □ AC power cord
3. □ Battery pack
4. □ DC power cord
5. □ Extra ventilator circuit
6. □ Oxygen tubing

### Astral Ventilator

1. □ Astral ventilator
2. □ AC Power cord
3. □ Vent circuit

### LTV Ventilator

1. □ LTV ventilator
2. □ External battery with cables
3. □ AC power cord
4. □ DC power cord
5. □ Extra ventilator circuit
6. □ Oxygen tubing
How to Check a Resuscitator Bag

Check the function of your child's resuscitator bag once each day. Make sure the bag is always in working order and ready for use when you need it.

Check:
☐ Oxygen tubing is connected to the resuscitator bag.
☐ PEEP valve is securely attached and set at ________cmH2O.
☐ Override clip is down.
☐ (Only use the clip to cover the pressure-limiting valve during the assessment of the trach during CPR.)
☐ Pressure manometer is attached.
☐ Port is closed.
☐ Test the bag. Wash your hands and put on new gloves. Cover the end that attaches to your child's trach tube and squeeze the bag. Make sure it self-inflates.

Check the oxygen source at home to make sure that you have plenty of oxygen in your system. Always check the amount of oxygen in your portable oxygen tank before you leave home.
Stroller Setup for Respiratory Equipment

Trilogy Ventilator

13” wide
10” high
7” deep
Oximeter
8” wide
3” high
6” deep

Suction machine
13” wide
10” high
7” deep
Storage
Suctioning Your Child’s Trach: Simple Suction Catheter

Why do we suction?
Mucus (secretions) builds up inside every tracheostomy tube. The purpose of suctioning is to keep the airway open so your child can breathe. You will need to remove the mucus your child is unable to clear by their own effort. The mucus must be coughed out or suctioned clear.

How often do we suction?
Since the amount of secretions varies from person to person, how often you suction will vary. To keep the airway clear, your child’s doctor has prescribed suctioning:

- Every 6 hours and as needed due to mucus
- When your child wakes in the morning and just before bed at night
- Every time you change the trach ties or the tube itself

Signs that your child needs to be suctioned
There are several ways your child will show they need suctioning. These include:

- Increased work of breathing:
  - Retractions: the skin around the bones in chest pulls in at each breath (in the neck, below the trach, above the collar bones, under breast bone, between and under the ribs)
  - Flaring of the nostrils
  - Rapid or hard breathing
- Increased mucus in the chest:
  - Coughing, noisy or gurgling sounds when breathing
  - Rumbling or rattling felt in child's chest by caregiver’s hand placement
- Fussy, distressed look, sweaty – clammy skin
- Pale or blue color or a drop in oxygen level (O2 sats)

Supplies for suctioning
(See photos at left.)
- Suction machine and connective tubing
- Simple suction catheter of appropriate size
- Resuscitator bag connected to oxygen, for use if needed
- Normal saline packets
- Gloves and hand sanitizer
Suctioning steps

1. Wash hands or use hand sanitizer.
2. Put gloves on.
3. Turn on suction machine and check suction pressure.
4. Give blow-by O2 with resuscitator bag.
5. Open suction catheter package. Connect catheter to suction connective tubing, being careful not to touch the tip of the catheter.
6. Pinch forefinger and thumb at predetermined suction depth. You want the tip of the catheter to pass just beyond the end of the tracheostomy tube.
7. Carefully but quickly insert the catheter directly into the tracheostomy tube opening to the predetermined suction depth.
8. As you withdraw the catheter, cover the port with your thumb to create suction.

Limit suctioning time to less than 10 seconds in the tube at a time.
If secretions are thick and hard to suction

1. Put a few drops of normal saline into the trach tube to help thin secretions.
2. Give blow-by O2 with the resuscitator bag to allow your child time to catch their breath between passes of the catheter.
3. Repeat suction steps and blow-by O2 as needed, using saline only if secretions remain thick and hard to suction through the catheter.

Finishing steps

1. At the end of suctioning, give blow-by O2 with resuscitator bag after removing the catheter.
2. Rinse suction tubing.
3. Discard catheter and saline packets.
How to Clean and Reuse a Suction Catheter at Home

It is important to use clean tracheostomy suction catheters to prevent the spread of germs.

If your child requires frequent suctioning, you may need more suction catheters than you receive each month. If you are having a shortage of suction catheters you may clean and reuse your suction catheters using the following steps.

Steps to suctioning and cleaning a tracheostomy catheter

Cleaning steps

1. Wash your hands or use hand sanitizer then put on clean gloves.
2. After you’ve finished suctioning, flush the catheter with fresh tap water. Put the catheter tip into a container of fresh water and turn on suction to draw water up through the catheter until sections are cleared from inside.
3. Take the catheter tip out of the water. Continue suctioning air through the catheter until it’s dry.
4. Take catheter off the suction machine connective tubing.
5. Wipe the outside of the catheter with isopropyl alcohol. Use an alcohol wipe or a clean paper towel with isopropyl alcohol on it.
6. Place suction catheter on a clean paper towel and allow to air dry.
How many suction catheters will my child receive each month?

- Ask your child’s equipment company how many suction catheters you will receive monthly. This will let you know how many catheters can be used each day.

  Example: If you receive 300 suction catheters each month, every day you will have 10 catheters to use. Always keep a spare catheter with each suction machine for an emergency.
Suctioning Your Child’s Trach: Closed (In-line) Suction Catheter

Why do we suction?
Mucus (secretions) builds up inside every tracheostomy tube. The purpose of suctioning is to keep the airway open so your child can breathe. You will need to remove the mucus your child is unable to clear by their own effort. The mucus must be coughed out or suctioned clear.

How often do we suction?
Since the amount of secretions varies from person to person, how often you suction will vary. To keep the airway clear, your child’s doctor has prescribed suctioning:
- Every 6 hours and as needed due to mucus
- When your child wakes in the morning and just before bed at night
- Every time you change the trach ties or the tube itself

Signs that your child needs to be suctioned
There are several ways your child will show they need suctioning. These include:
- Increased work of breathing:
  - Retractions: the skin around the bones in chest pulls in at each breath (in the neck, below the trach, above the collar bones, under breast bone, between and under the ribs)
  - Flaring of the nostrils
  - Rapid or hard breathing
- Increased mucus in the chest:
  - Coughing, noisy or gurgling sounds when breathing
  - Rumbling or rattling felt in child’s chest by caregiver’s hand placement
- Fussy, distressed look, sweaty – clammy skin
- Pale or blue color or a drop in oxygen level (O2 sats)

Supplies for suctioning
(See photos at left.)
- Suction machine and connective tubing
- Closed suction catheter of appropriate size
- Resuscitator bag connected to oxygen, for use if needed
- Normal saline packets
- Gloves and hand sanitizer
Suctioning steps

1. Wash hands or use hand sanitizer.

2. Put gloves on.

3. Turn on suction machine and check suction pressure.

4. Pre-oxygenate your child by increasing the oxygen on the ventilator for about 30 seconds prior to suctioning.

5. Unlock thumb valve so it can be depressed to start suction.

6. Open normal saline packet and insert into saline port.

7. With one hand, stabilize the trach tube, while using the other hand to advance the catheter to the predetermined suction depth.

The depth will be seen in the observation window.
8. **Apply suction continuously by depressing thumb valve while slowly withdrawing the catheter.**

Limit suctioning time to less than 10 seconds in the tube at a time.

If secretions are thick and hard to suction

1. **Put a few drops of normal saline into the trach tube using the saline port to help thin secretions.**

2. **Suction again.**

3. **Give your child a chance to catch their breath between every suctioning pass.**

Finishing steps

1. **Rinse the closed suction catheter after suctioning by depressing the thumb valve at the same time you put saline drops into the saline port.**

2. **When done with suctioning: close thumb valve, remove saline packet and close the saline port.**

3. **Return oxygen to the original setting.**

In-line suction catheters are dated and changed weekly. Do not use in-line catheters to obtain tracheal aspirate (sample of secretions) for culture.
Tracheostomy Stoma Care (Trach Care)

Why is it important to clean the stoma?
The tracheostomy stoma is a hole in the front of your child’s neck where the trach tube is placed. Routine care of the tracheostomy stoma and neck will reduce the chance of infection. Regular tracheostomy tie changes help reduce neck irritation. This is the best time to carefully check the skin around the stoma site and neck. Look for any changes, such as redness, irritation, breakdown, granulation and drainage.

How often should we clean it?
- Daily
- As ordered by your child’s doctor
- More frequent care is needed if:
  - Skin becomes irritated (stoma or neck wound)
  - Dressing or ties are visibly soiled

Equipment you will need
Always have essential equipment (spare tracheostomy tubes, oxygen, suction machine, resuscitation bag and mask). See the Essential Equipment Checklist in your handbook on page 17 for a detailed list.

For cleaning your child’s stoma:
- Sterile water
- Small cup for water
- Cotton swabs (Q tips)
- Gauze or clean wash cloth
- Tracheostomy ties and scissors
- Stoma dressings
- Syringe (for use with cuffed tubes only)
- Medicine for the skin if ordered

Steps for Setup
2. Wash hands.
3. Gather all the supplies and set them up on a cleaned surface.
4. Pour the sterile water into a small cup and dampen cotton swabs and gauze with water.
5. Have another gauze and cotton swabs for drying.
6. If ordered, sprinkle nystatin powder onto gauze.
7. Cut clean trach ties to the correct size.
Tracheostomy Handbook

Steps for cleaning the stoma

1. Place your child on their back with a rolled blanket or large towel under their shoulders. This will cause the head to fall back, allowing you better access to the neck. Swaddling – wrapping a baby or young child's upper body and arms snugly in a blanket or sheet – will make them feel secure and keep their hands away from the stoma.

2. Suction your child's tracheostomy before starting stoma care. See “Suctioning Your Child’s Trach” for instructions.

3. Put gloves on.

Clean stoma and neck

1. Hold
Two trained caregivers are needed for stoma care. Have one person hold the tracheostomy tube in place while the other person removes the dirty ties and dressing. For the safety of your child, it is important that the person holding the trach stays completely focused on keeping the trach in place so the trach tube does not come out.

2. Clean
Wet a cotton swab. Keeping the trach in place, clean around the stoma site. Start at the stoma and roll the swab away. Use the swab for only 1 swipe, then discard. Repeat process until the stoma is satisfactorily cleaned.

3. Dry
Use a new swab to dry around the stoma site. Start at the stoma and roll the swab away. Use the swab for only 1 swipe, then discard. Repeat process until the stoma is satisfactorily dried.
Inspect the site

1. When the tracheostomy ties are off, you have a better view of the stoma site and neck. Check for skin redness, irritation and breakdown. Contact otolaryngology if granulation is developing and for wound advice.

Replace dressing and trach ties

1. Place new dressing around the trach tube.

2. Secure the tracheostomy tube to the neck using velcro tracheostomy ties. Tracheostomy ties should be tight enough to hold the tracheostomy tube securely in place.

3. Check both sides of the neck one at a time (they should be snug and even). One finger should fit in between the tracheostomy tie and neck.

4. **Clean**
   Use a wet, clean, soft washcloth or wet gauze to wash the remaining neck area. **Start at the flange and swipe away.**

5. **Dry**
   Use a clean, dry gauze to dry the remaining neck area. **Start at the flange and swipe away.**

6. Apply medicine to neck as ordered. Start at the back of neck and pat forward towards the stoma. Stop when you reach the flange of the trach tube.
Bivona TTS Trach Cuff

What is the cuff?
The cuff is an inflatable area near the end of the trach tube. This cuff is used to help direct the breaths from the ventilator to your child’s lungs.

How often do I need to check the cuff?
Check the cuff twice daily. Once in the morning and then in the evening to make sure the cuff has the correct amount of sterile water in the cuff.

To check the amount of sterile water in the cuff
Deflate the cuff first
Cuff deflation and inflation are done while the trach is in your child. The photos below simply show how the cuff works and are for education purposes only.

1. Wash your hands or use hand sanitizer and put on clean gloves.
2. Use a Luer-Lok tip syringe. Make sure that the plunger is all the way in like in the photo.
3. Push and twist syringe onto the pilot balloon.
4. Pull back the plunger to draw all the sterile water and air into the syringe.
5. Hold the plunger with your thumb and pointer finger to keep the water from going back into the cuff.
6. Hold the pilot balloon and twist off the syringe.
Hold the syringe with the Luer-lok end up. Slowly push the plunger up to remove the air.

Use your finger to flick the syringe to remove the air bubbles from the sterile water.

Hold at eye level and see how many ml’s of sterile water is in the syringe.

Inflate the cuff

Wash your hands or use hand sanitizer then put on clean gloves.

Use a Luer-Lok tip syringe.

Pour fresh sterile water into a medicine cup.

Draw up the prescribed amount of sterile water into the syringe. Be sure to remove the air bubbles and check that the water level in the syringe is accurate.

Hold the pilot balloon and push and twist the syringe in place.

Push the plunger in slowly to inflate the cuff.
How do I check the cuff to make sure that it is working properly before a trach change?

Before placing a new or cleaned trach, you need to check the cuff to make sure that it inflates evenly and does not leak sterile water.

1. Be sure to wash your hands and have on clean gloves.
2. Over-inflate the cuff with 5ml of sterile water and check to make sure that the cuff inflates evenly and does not leak. Then remove the 5ml of sterile water, verify that the cuff completely deflated.

How much sterile water goes into my child’s trach cuff?

This is determined by the Respiratory Therapist (RT). If your child is on a ventilator, Bipap, CPAP, or Cough Assist, the therapist will find the amount of sterile water needed in the cuff to provide good chest rise with a small amount of leak around the trach tube. This small amount of leakage is good and it confirms that a small amount of air can get around the cuff and that the cuff is not overinflated or pushing against the inside of the trachea. This leak is called the minimal leak technique. To find the minimum amount of sterile water, the RT will watch the chest rise, check the size of their breaths on the ventilator and listen for a audible leak and bubbles around the trach tube at their stoma site. Some children may need to have a little more fluid added to the cuff to prevent the leak. This is called the minimal occlusion value. The amount of sterile water in the cuff may change as your child grows or when the trach tube size has been changed. Your child may need more sterile water in the cuff if you hear a large leak around the stoma or if the ventilator gives additional breaths (auto-cycles) when the child is asleep. Contact your doctor so they can help with this evaluation and make the changes on the home care orders.
Tracheostomy Tube Change

Why is it important to change the trach tube?
Routine tracheostomy tube change reduces germs and lessens the chance of infection.

How often should I change it?
Change the trach tube monthly unless your doctor orders more frequent changes.

Equipment you will need for tube change
- Clean trach tube(s) - 1 same size child is using and 1 of smaller size
- Syringe (for use with cuffed tubes only)
- Water soluble lubricant
- Sterile water
- Small cup for water
- Cotton swabs (Q tips) - 8 to 16
- Gauze or clean wash cloth
- Tracheostomy ties and scissors
- Stoma dressing
- Medicine for the skin, if ordered
- Essential equipment (spare tracheostomy tube of same size and one size smaller, suction, oxygen, resuscitation bag and mask). See the section Essential Trach/Vent Equipment for Home or To Go on page 17.

Emergency Supplies
Keep these items on hand in case your child has a breathing emergency during a Trach tube change.
Steps to take when changing the tracheostomy tube

Per your doctor’s orders, your child may need additional oxygen and suction before changing the trach tube.

Prepare the trach tube

1. **Correct**
   When handling the trach tube only handle the tube by the flanges.

2. **Incorrect**
   Do not touch the end that will go into your child.

   - If using a cuffed tube, before you get started, check its function by inflating and deflating the cuff before you use the tube.
     - For a Bivona tracheostomy tube use 5 ml of water; check for water leaking and watch for the cuff to inflate evenly.
     - For a Shiley tracheostomy tube use 8 to 11 cc of air and dip into sterile water, check for air escaping and watch for the cuff to inflate evenly.

3. Insert the obturator into tube to keep the tube in the best position for easier insertion. The obturator will help guide the tube into the stoma.

4. Apply a thin film of water-soluble lubricant to the end of the cannula that will go into your child.

5. Set aside the assembled trach tube in a clean, safe place, such as the container it came in, or a new, clean plastic bag until ready to use.
Prepare your child
Get a trained helper. Routine trach change requires two people.

1. Place your child on their back with a rolled blanket or large towel under the shoulders. This will cause their head to fall back allowing you better access to the neck. Wrapping your child’s upper body and arms snuggly in a blanket will make them feel secure and keep their hands away from the trach.

2. Wash or gel hands then put on clean gloves.


Remove the old tube from child’s stoma

1. Person #1 holds the trach tube in place while a second person (person #2) removes the trach ties and dressing.

2. Person #2 deflates the cuff before removing a cuffed tube.

3. Coordinate and communicate with your trach change partner and when both parties are ready, say “1, 2, 3 go”: Person #1 holding trach tube in place will remove the trach tube and the other person #2 will place the new trach tube.

Person #1 holding the old trach tube rolls, glides or pulls the tube forward and down out of the stoma.
Tracheostomy Handbook

Place new tube

1. Person #2 inserts the clean trach tube into the stoma. The tube should slide into place as you apply gentle inward pressure.

2. Person #2 holds the trach tube in place removing the obturator with their other hand. Person #2 immediately removes the obturator from the trach tube, then places the child on the ventilator (if applicable).

3. Check placement by passing a suction catheter to the routine depth. Your child may cough and you should feel air passing in and out of the tube, you should also see chest rise and good skin color. Person #2 should now be the holder and should continue to hold trach tube through stoma care.

4. Inflate the cuff if in use.

5. Clean the tracheostomy site as usual. (See Tracheostomy Stoma Care PE1450)

6. Clean the obturator and place it in a clean bag with the spare tubes.

7. Clean old trach.

8. Refer to Bivona Trach Cleaning Steps, on the next page.
Bivona Trach Cleaning Steps

Clean your Bivona Trach after each trach change following these steps.

How to clean and reuse a Bivona tracheostomy tube

It is a good idea to have 3 of the same sized trach tubes at home. One in your child, one clean and stored in a new zip-lock bag and one in the process of being cleaned.

1. Wash your hands or use hand sanitizer then put on clean gloves.

2. Wash the trach tube and the obturator in warm soapy water each time you change your child’s trach (at least monthly). Soak up to 1 hour to ensure that the trach is completely clean. Use clear, unscented, non anti-bacterial dish soap.

3. Rinse completely.

4. Next, place the tube and the obturator side by side in a 2 to 4 quart pot of rapidly boiling water. Or, use a baby bottle sterilizer in place of boiling. Follow manufacturer’s instructions for use.

5. Cover with a lid. Leave for only a moment.

6. Then, quickly remove the pan from the heat.
Tracheostomy Handbook

7 Turn off the stove.

8 Allow the water and trach parts to cool completely in the pan.

9 Wash your hands or use hand sanitizer then put on clean gloves.

10 Remove the tube and the obturator from the water.

11 Place the trach tube and the obturator on clean paper towels to dry. Set it aside so it won’t be in the way.

12 After the trach tube and obturator are completely dry, store in a new zip-lock bag.

When trach tube and obturator are completely dry, wash your hands, put on new gloves and inspect the tube closely for any possible damage. Contact your durable medical equipment company and let them know if the trach is damaged.

Storage
- Store in a new zip-lock bag every time. Be sure to date it and keep track of the number of times that it has been cleaned.
- You can clean and re-use a Bivona tracheostomy tube up to 5 times if there are no signs of damage.
Signs of Respiratory Distress in Your Infant with a Trach

To tell whether your baby is having trouble breathing or is in distress, you will need to know the amount of “work” or effort they are using to breathe:

1. Know your baby’s normal breathing rate, heart rate and oxygen levels (called O2 saturation or O2 “sats”).
2. Know your baby’s breathing pattern at rest. Watch them breathe, checking for retractions, nasal flaring or use of accessory muscles.
3. Know the warning signs that show increased work of breathing (below).
4. Call your healthcare provider if your baby looks or acts in the ways given below.

What will my baby look like when they are breathing hard?

- Rapid breathing (see how to find breathing rate below)
- Increased secretions, noisy breathing (wheezing, grunting, gurgling, high-pitched noise when breathing in or out)
- Rumbling or rattling in chest felt by caregiver’s hand placement
- Poor skin color or a drop in oxygen level (O2 sats)
- Poor or no chest rise
- Stomach sucking in more than usual with breathing
- Retractions – skin pulling in around bones in chest (in the neck, below the trach, above the collar bones, under the breast bone, between and under the ribs)
- Flaring of the nostrils
- Head moving back and forth with each breath (head bobbing)
- Increased coughing
- Sweating – clammy skin
- Distressed look

What the signs mean

- Nasal flaring - When nostrils spread open while your child breathes, they may be having to work harder to breathe.
- Wheezing – A whistling or musical sound of air trying to squeeze through a narrowed air tube. Usually heard when breathing out.
- Sweating - There may be an increase of sweat on your child’s head, but without their skin feeling warm to the touch. More often, their skin will feel cool or clammy. This may happen when their breathing rate is very fast.
• Grunting - Grunting sound when breathing out. The grunting is the body’s way of trying to keep air in the lungs so they will stay open.
• Retractions - Skin pulling in or tugging around bones in the chest (in neck, above collar bone, under breast bone, between and under ribs). Another way of trying to bring more air into the lungs.

What will my baby act like when they are breathing hard?

• Agitated
• Inconsolable (unable to be soothed or calmed)
• Lethargic (acting tired and weak)
• Fussy
• Waking up from sleeping with cough and secretions or unable to sleep comfortably

When should I call 911?

Call 911 if any of these happen:

• If your child loses consciousness, start CPR and call 911.
• Trach has come out and you are unable to replace trach tube. Support with O2/resuscitation bag and mask and call 911.
• Trach has been placed but you are unable to confirm placement. Remove trach/support with O2/resuscitation bag and mask and call 911.
• If your child has an increased oxygen need for over 60 minutes per doctor’s orders.
• Child has increased respiratory distress with severe difficulty breathing.
• Child has stopped breathing for 15 seconds or longer (called “apnea”). Support with O2 resuscitation bag and mask and call 911.
• Child has blue-tinged skin (cyanosis) especially around the lips, fingernails, and gums. This may not be visible on darker skin tones. Pay close attention to your child’s breathing and behavior and use an oximeter at all times.
• If you are unable to wake your child.
Your child’s baseline normals

**Normal breathing rate:**
- Awake: ____________
- Asleep: ____________
- Agitated: ____________

**Normal heart rate:**
- Awake: ____________
- Asleep: ____________
- Agitated: ____________

**Normal oxygen level (O2 sats)**

**Work of breathing baseline:**

Breathing rate is the number of breaths in and out in one minute. Count the number of times their stomach rises and falls in one minute. (One rise and fall equals one breath.)
Signs of Respiratory Distress in Your Child with a Trach

To tell whether your child is having trouble breathing or is in distress, you will need to know the amount of “work” or effort they are using to breathe:

1. Know your child’s normal breathing rate, heart rate and oxygen levels (these are called O2 saturation or O2 “sats”).
2. Know your child’s breathing pattern at rest. Watch them breathe, checking for retractions, nasal flaring or use of accessory (extra) muscles.
3. Know the warning signs that show increased work of breathing (below).
4. Call your healthcare provider if your child looks or acts in the ways given below.

What will my child look like when they are breathing hard?

- Rapid breathing (see how to find breathing rate below)
- Increased secretions, noisy breathing (wheezing, grunting, gurgling, high-pitched noise when breathing in or out)
- Rumbling or rattling in chest felt by caregiver’s hand placement
- Poor skin color or a drop in oxygen level (O2 sats)
- Poor or no chest rise
- Stomach sucking in more than usual with breathing
- Retractions – skin pulling in around bones in chest (in the neck, below the trach, above the collar bones, under the breast bone, between and under the ribs)
- Flaring of the nostrils
- Increased coughing
- Sweating – clammy skin
- Distressed look

What will my child act like when they are breathing hard?

Your child may communicate or sign that they are having trouble breathing. They may be:

- Frightened or scared
- Agitated
- Inconsolable (unable to be soothed or calmed)
- Lethargic (acting tired and weak)
- Fussy
- Waking up from sleeping with cough and secretions or unable to sleep comfortably
What the signs mean

• Nasal flaring - When nostrils spread open while your child breathes, they may be having to work harder to breathe.

• Wheezing – A whistling or musical sound of air trying to squeeze through a narrowed air tube. Usually heard when breathing out.

• Grunting - Grunting sound when breathing out. The grunting is the body’s way of trying to keep air in the lungs so they will stay open.

• Retractions - Skin pulling in or tugging around bones in the chest (in neck, above collar bone, under breast bone, between and under ribs). Another way of trying to bring more air into the lungs.

• Sweating -There may be an increase of sweat on your child’s head, but without their skin feeling warm to the touch. More often, their skin will feel cool or clammy. This may happen when their breathing rate is very fast.

• Skin color changes – A sign child is not getting enough oxygen. Pale, blue-gray color around lips and under eyes. This may not be visible on darker skin tones. Pay close attention to your child’s breathing and behavior.

When should I call 911? Call 911 if any of these happen:

If your child loses consciousness, start CPR and call 911.

Call 911 if:

• Trach has come out and you are unable to replace trach tube. Support with O2/resuscitation bag and mask and call 911.

• Trach has been placed but you are unable to confirm placement. Remove trach/support with O2/resuscitation bag and mask and call 911.

• Your child has an increased oxygen need for over 60 minutes per doctor’s orders.

• Child has increased respiratory distress with severe difficulty breathing.

• Child has stopped breathing for 15 seconds or longer (called “apnea”). Support with O2 resuscitation bag and mask and call 911.

• Child has blue-tinged skin (cyanosis) especially around the lips, fingernails, and gums. This may not be visible on darker skin tones. Pay close attention to your child’s breathing and behavior and use an oximeter at all times.

• You are unable to wake your child.
To find your child’s breathing rate:
Breathing rate is the number of breaths in and out in one minute.
1. Count the number of times their stomach rises and falls in 30 seconds.
   (One rise and fall equals one breath.)
2. Double that number to get the breathing rate for one minute.

**Your child’s baseline normals**

**Normal breathing rate:**
Awake: _______________
Asleep: _______________
Agitated: _______________

**Normal heart rate:**
Awake: _______________
Asleep: _______________
Agitated: _______________

**Normal oxygen level (O2 sats)**

**Work of breathing baseline:**
_______________________________________
_______________________________________
Understanding Tracheitis in Your Child with a Trach

What is tracheitis?
Tracheitis is an infection of the trachea, the upper airway below the vocal cords, commonly known as the “windpipe.”

The infection causes inflammation (redness and swelling) of the upper airway, increased mucus and a change in the color or smell of the mucus.

What causes tracheitis?
Tracheitis can be caused by either a virus or by bacteria. Your child may develop signs of tracheitis during or after a cold.

How is tracheitis treated?
It depends on the cause. If your doctor thinks the tracheitis is from a virus, no antibiotics will be prescribed, because they have no effect on viruses. Support your child with increased suctioning and maintaining an open airway as the tracheitis resolves on its own over time.

If the tracheitis is thought to be a bacterial infection, then your doctor will prescribe an antibiotic, either by mouth or inhaled. Tobramycin, or “Tobi,” is one type of inhaled antibiotic often prescribed. It can be given directly through the tracheostomy tube with a nebulizer and a resuscitator bag, to deliver medicine directly to the infected area of the trachea.

If your child has symptoms of tracheitis, contact your healthcare provider right away. You may be asked to bring a sample of the secretions to a laboratory to check for signs of an active infection. There are always some bacteria living inside a trach tube, but they increase in number when a child has tracheitis, as does the number of white blood cells.

How will I know my child has tracheitis?
Your child will develop symptoms that can include:

- Fever of 101.5 F or above
- Frequent and strong coughing
- Change of color, thickness and odor of the trach secretions (mucus)
- A need to suction more often

Symptoms that suggest a worsening infection include:

- Fever lasting longer than 2 or 3 days
- Increased breathing effort
Faster breathing
- Retractions (skin sucks in between neck and ribs during work of breathing)
- Nasal flaring
- Increased oxygen requirement
- Noisy breathing
- Infants may have difficulty feeding and/or they may vomit due to excessive coughing

**How can I keep my child from getting tracheitis?**

Prevention is key.

- Always wash your hands with soap and water for 20 seconds or with gel for 15 seconds before caring for your child, especially if other members of the home have a cold. Viral illnesses can spread when handwashing is not properly done or when it is forgotten.
- Wear gloves when suctioning or doing stoma care.
- Keep your child away from other children with cold symptoms.
- Avoid bringing your child to activities that involve crowds; and avoid close contact with other children or anyone with fever, runny nose or cough, especially during the winter/viral season.
- Encourage hand washing by all family members and anyone else before touching your child.
- Cover your mouth and nose when sneezing or coughing. Quickly throw away used tissue and wash your hands.

Despite your best efforts, your child will get a cold which may develop into a viral or bacterial tracheitis. By recognizing symptoms early and calling your healthcare provider, and keeping extra mucus out of your child’s airway, you will support a quick recovery.
Trach/Vent Sick Day Management at Home

What steps do I take when my child gets sick with a respiratory illness?
When your child is sick with a respiratory illness, they may need extra support to be able to breathe better. It is important for you to contact your child’s pulmonary team when your child starts to show signs of respiratory illness.

What information is asked during a sick call?
Here are some common questions we will ask to help determine how sick your child is.
• When did your child’s symptoms start?
• How often are you suctioning?
• What do their secretions look like?
• How would you describe their work of breathing?
• Are there any vent/ monitor alarms going off more frequently than normal?
• Have they had a fever?
• What are their oxygen saturations? Have they needed any extra oxygen?
• Have you given any extra airway treatments (CPT: clapping, cough assist, vest)?
• Have you given any “as needed” (PRN) respiratory medicines?
• Are they tolerating their feeds/keeping food down?

What signs and symptoms do I look and listen for in my child?
☐ How hard they are breathing i.e. retractions, nasal flaring etc.
☐ Your child’s respiratory rate and the respiratory rate shown on the vent
☐ Frequent ventilator alarms
☐ Secretion color, thickness and amount
☐ Breath sounds: coarse, wheezing
☐ Coughing
☐ Oxygen saturations: desats or lower than normal
☐ Changes in oxygen needs
☐ Changes in heart rate and temperature
☐ If you are giving any extra airway treatments or giving any “as needed” respiratory medicines, are they helping?
☐ Energy level/ lethargy
☐ Change in urine output (how much are they peeing?)

What treatment plans might I expect from a sick call?
The nurses on the pulmonary trach/vent line will assess your child’s symptoms and will always consult with the pulmonary doctor.

• We may advise you to just watch your child for awhile and not treat immediately.
• We will likely always have you increase frequency of airway clearance and increase use of ordered PRN respiratory medications i.e. puffs, nebs.
• We may add new medicine or change dose or frequency of current respiratory medicines.
• You may need to drop off a trach sputum sample at a lab.
• Not all respiratory illnesses will require antibiotics.
• We may have you hold vent breaks or use of speaking valve or cap during illness.
• We may temporarily increase your child’s vent settings.
• We will update home nursing agencies with plan of care.
• We may recommend a visit to your child’s PCP or the nearest emergency room. In some cases, we may recommend calling 911.

Who to call and when for a sick child Weekdays
• The direct line to reach your child’s pulmonary nurses is 206-987-4728. Add us as a contact to your smartphone so you have quick access to us and your pulmonologist.

Evenings and weekends
• If you are calling after 5 p.m. weekends, or on holidays, please call Seattle Children’s Hospital operator and ask for the on-call pulmonologist.

Who to call for other medical needs
• Call your Respiratory DME company if your child’s respiratory equipment is not working properly.
• For non-respiratory symptoms, please contact your child’s primary care provider or other specialty clinic.
How to Collect a Mucus Sample at Home
Getting mucus for a trach culture

Keep watch for trachea infections
A child with a trach can get an infection in the trachea (windpipe.) The medical word for this infection is tracheitis. The infection causes redness and swelling (inflammation) of the upper airway and increased mucus. The mucus becomes thicker, smells and changes to a yellow or green color. When an infection is suspected, a specimen trap is often used to collect a sample of mucus for a trach culture.

What is a trach culture?
A trach culture is a test that is done on the mucus you collect from the trach tube using a specimen trap. This test is ordered by your child’s primary care doctor and the mucus sample is taken to a laboratory for testing (called a culture).

Using a specimen trap
A specimen trap is a special cup with a lid (see on right). You get these from your supply company. It is important not to touch the inside of the lid or container. The only thing that should touch the inside of the specimen trap is your child’s mucus when you suction the trach.

How do I collect a mucus sample?

Gather supplies
- Specimen trap (pictured at left)
- Suction machine and connective tubing
- Brand new, never been used suction catheter package - simple suction catheter of appropriate size
- Resuscitator bag connected to oxygen, for use if needed
- Normal saline packets
- Gloves and hand sanitizer

Steps
1. Wash hands or use hand sanitizer.
2. Put gloves on.
3. Turn on the suction machine and check suction pressure.
4. Give blow-by O2 with resuscitator bag, or increase the O2 on the ventilator if needed.
5. Open the sterile specimen trap package.

Refer to photo above:
6. Connect suction connective tubing to the white end of the specimen trap
7. Open suction catheter package. Connect suction catheter to green end of specimen trap. Be careful not to touch the tip of the catheter.
8. Suction as normal. The mucus will collect in the specimen cup container.
9. Limit suctioning time to less than 10 seconds in the tube at a time.
10. Repeat suction steps and blow-by O2 or increased O2 on the ventilator as needed, using saline only if the mucus remain thick and hard to suction through the catheter.
11. After you have finished collecting a sample of mucus (at least ¼ teaspoon size), remove the top of the specimen trap and catheter and discard in the garbage (see below).
Prepare the sample to bring to a lab

1. Take the cap from the bottom of the specimen trap and put it on top of the container. Be sure to screw it on tightly and do not touch the inside of the container or the inside of the cap. Discard the rest of the specimen trap parts.

2. Write your child’s name and the date that the sample was collected. Put the label on the container.

3. Call your primary care provider’s office.

4. Take the sample to the lab per your primary care office instructions.

5. The lab will contact your child’s doctor with the test results. The doctor will then let you know the results and if you need to give your child medicines.
Hand-Held Nebulizer Treatment for a Child with a Tracheostomy

Hand-held nebulizer treatment for a child with a tracheostomy

Use these steps to deliver inhaled antibiotics like Tobramycin, “Toby” to treat tracheitis.

Set up:
1. Check the resuscitator bag before use (page 21).
2. Set up the resuscitator bag with these parts in order: (See drawing above).
3. Plug in the compressor to AC power and attach the oxygen tubing from the nebulizer to the compressor.

Give the medicine:
1. Turn on the oxygen to the resuscitator bag (check the doctor’s order for the oxygen dose).
2. Have the child in a comfortable position such as sitting up or on the wedge.
3. Add the medicine to the medicine cup.
4. Hold the medicine cup upright so it will not spill or become disconnected.
5. Take child off the vent and immediately start to give breaths with the resuscitator bag.
6. Turn on the compressor to start the treatment.
7. Bag until the medicine in the medicine cup starts to hiss and spit.
8. Turn off the compressor.
9. Place the child back on the vent.
10. Clean the nebulizer cup, T piece and adapter as directed.
MDI (inhaler) with Spacer Treatment for a Child with a Tracheostomy

How to give the MDI medicine for a child with a tracheostomy

Set up:
1. Check the resuscitator bag before use (page 21).
2. Turn on the oxygen, check the doctor’s order for the oxygen dose.
3. Check the doctor’s order for how many puffs to be given.
4. Check the MDI to see how many doses are in the canister.
5. Always use a bacteria filter when giving an MDI.

Give the medicine:
1. Shake the MDI rapidly for several seconds to mix the medicine.
2. Insert the canister from the MDI (inhaler) into the spacer and attach as shown above.
3. Take child off the vent and immediately connect the spacer to the trach.
4. Give a puff of medicine.
5. Give 6 breaths with the bag after each puff of medicine.
6. Place the child back on the vent.
7. Wait 30 seconds between puffs.
8. Repeat steps 3-6 for any additional puffs.
9. Shake the MDI between puffs to mix the medicine.
10. Clean the spacer as directed.
**Emergency Airway Management (Conscious Child with Tracheostomy)**

Kids at home with trachs can often have trouble breathing when the trach becomes blocked with mucus or the trach comes out.

**Child is showing signs of respiratory distress**
- Increased work of breathing, respiratory rate, retractions
- Poor color, drop in oxygen levels
- Poor or no chest rise
- Whistling or wheezy sounds from trach
- Increased vocalization around trach tube
- Agitated/upset

**Always have essential equipment with your child at all times**
- Tracheostomy tube the same size as your child's
- Trach tube one size smaller (emergency trach)
- Syringe (for cuffed tubes only) and lubricant
- Suction equipment and supplies
- Resuscitation bag, face mask, stoma mask
- Oxygen

---

**If at any time your child loses consciousness, start CPR.**

---
Trach Safe

Quick Steps in a Trach Breathing Emergency

**ALARMS SOUNDING?**

RESPOND IMMEDIATELY to all alarms!
Look at child for signs of respiratory distress

**TRACH TUBE BLOCKED OR OUT?**

REPLACE TUBE
Same size ➔ smaller size ➔ support with O2/bag and mask
Call 911

**GOT MUCUS?**

SUCTION
May need to ↑ O2, use saline, resuscitator bag and cough assist

**EQUIPMENT PROBLEM?**

FIRST: Make sure child is OK
Support with O2/bagging if needed
THEN: Troubleshoot to identify problem
NEXT: Fix or call equipment company for help

❗ If your child loses consciousness, START CPR ❗
CPR for Infant with a Tracheostomy

These steps are for an infant under age 1 year. If your baby is not responding to your voice or touch or appears to be gasping for breath, follow the steps below.

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>ACTION NEEDED</th>
</tr>
</thead>
</table>
| Unresponsive: Infant is not breathing. | **Check for responsiveness:**  
  Tap infant on shoulder or foot. “Are you OK?” If no response and no breathing, shout for family member to call 911.  
  Place infant on their back on a firm flat surface. |
| Not breathing: No air movement. | **Give air:**  
  Position the airway: Tilt head, lift chin, uncover tracheostomy. Make sure trach is open and airway is in place.  
  Give 2 breaths into the trach with self-inflating resuscitation bag or mouth-to-trach. Give just enough air volume to make the chest rise like a natural breath.  
  IF chest does not rise with breath and pressure valve on bag pops off: Disable pressure valve on bag and give 2 breaths.  
  IF no chest rise – plugged trach: Remove and replace trach. Then give the 2 breaths. |
| Still not breathing and no signs of life after giving air. | **Try to start heart:** (Give CPR)  
  Assume no pulse. (If trained, check the brachial pulse for 10 seconds. If no pulse, or slower than 60 bpm, start CPR.)  
  Begin 30 chest compressions with 2 fingers on the breastbone just below the nipple line. Push bone down 1.5 inches (4 cm).  
  Rate: 100-120 compressions per minute  
  Continue cycles of 30 compressions and 2 breaths until help arrives. |
| CPR ongoing | **Keep CPR going steady for 2 minutes.**  
  This is 5 cycles of 30 chest compressions and 2 breaths.  
  Stop CPR after 2 minutes to call 911 now if not already called.  
  Resume CPR and continue (don’t stop) until medics arrive or child responds. |
| Child becomes responsive | **If child becomes responsive, opens eyes, moves or shows any signs of life, stop compressions.**  
  Continue to support breaths if needed with self-inflating bag at a rate of 20 breaths/minute = 1 breath every 3 seconds. |

If your child has a primary heart condition, please consult with the cardiac team.
# CPR for Child with a Tracheostomy

If your child ages 1 to puberty is unresponsive, not breathing or is gasping for air, follow the steps below.

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>ACTION NEEDED</th>
</tr>
</thead>
</table>
| **Unresponsive:** Child is not breathing or is gasping for air. | **Check for responsiveness:**  
Tap child on shoulder or foot. “Are you OK?” If no response and no breathing, shout for family member to call 911.  
Place child on their back on a firm flat surface. |
| **Not breathing:** No air movement.            | **Give air:**  
Position the airway: Tilt head, lift chin, uncover tracheostomy. Make sure trach is open and airway is in place.  
Give 2 breaths into the trach with self-inflating resuscitation bag or mouth-to-trach. Give just enough air volume to make the chest rise like a natural breath.  
IF chest does not rise with breath and pressure valve on bag pops off: Disable pressure valve on bag and give 2 breaths.  
IF no chest rise – plugged trach: Remove and replace trach. Then give the 2 breaths. |
| **Still not breathing** and no signs of life after giving air. | **Try to start heart:** (Give CPR)  
Assume no pulse. (If trained, check for carotid pulse (in neck) for 10 seconds. If no pulse or slower than 60 bpm, start CPR)  
Begin 30 chest compressions with heel of one hand on the breastbone just below the nipple line. Use 2 hands if needed.  
Push bone down 2 inches (5 cm).  
Rate: 100-120 compressions per minute  
Continue 30 compressions: 2 breaths until help arrives. |
| **CPR ongoing**                               | **Keep CPR going steady for 2 minutes.**  
This is 5 cycles of 30 chest compressions and 2 breaths.  
Stop CPR after 2 minutes to call 911 now if not already called.  
Continue CPR until medics arrive or child responds. |
| **Child becomes responsive**                  | **If child becomes responsive, opens eyes, moves or shows any signs of life, stop compressions.**  
Continue to support breaths if needed with self-inflating bag at a rate of 20 breaths/minute = 1 breath every 3 seconds. |

If your child has a primary heart condition, please consult with the cardiac team.
## CPR for Teen/Adult with a Tracheostomy

If your teen has entered puberty or beyond and is unresponsive, not breathing or is gasping for air, follow the steps below.

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>ACTION NEEDED</th>
</tr>
</thead>
</table>
| **Unresponsive:** Teen/adult is not breathing or is gasping for air. | Check for responsiveness:  
Tap teen on shoulder. Ask “Are you OK?” If no response and no breathing, shout for family member to call 911.  
Place teen/adult on their back on a firm flat surface. |
| **Not breathing:** No air movement.         | Give air:  
Position the airway: Tilt head, lift chin, uncover tracheostomy. Make sure trach is open and airway is in place.  
Give 2 breaths into the trach with self-inflating resuscitation bag or mouth-to-trach. Give just enough air volume to make the chest rise like a natural breath.  
**IF** chest does not rise with breath and pressure valve on bag pops off: Disable pressure valve on bag and give 2 breaths.  
**IF** no chest rise – plugged trach: Remove and replace trach. Then give the 2 breaths. |
| **Still not breathing** and no signs of life after giving air. | Try to start heart: (Give CPR)  
Assume no pulse. (If trained, check for carotid pulse (in neck) for 10 seconds. If no pulse or slower than 60 bpm, start CPR)  
Begin 30 chest compressions with heel of 2 overlapped hands on the breastbone just below the nipple line.  
Push bone down 2 inches (5 cm)  
Rate: 100-120 compressions per minute  
Continue 30 compressions: 2 breaths until help arrives. |
| **CPR ongoing**                             | Keep CPR going steady for 2 minutes. This is 5 cycles of 30 chest compressions and 2 breaths.  
Call 911 now if not already called.  
Continue CPR until medics arrive or teen/adult responds. |
| **Teen/adult becomes responsive**           | If child becomes responsive, opens eyes, moves or shows any signs of life, stop compressions.  
Continue to give breaths if needed with self-inflating bag at rate of 10 to 12 breaths/minutes or 1 breath every 5 to 6 seconds. |

If your child has a primary heart condition, please consult with the cardiac team.
Bag-Mask Ventilation
With a Self-Inflating Resuscitator Bag

What is bag-mask ventilation?
Bag-mask ventilation is a way to deliver breaths and oxygen to your child with a self-inflating resuscitator bag and a properly fitting face mask.

Some children may need occasional “bagging” as part of their emergency care plan and some will need it only in a breathing emergency.

We will give you an individualized emergency plan for you to follow before you leave the hospital.

A trained caregiver can provide bag-mask ventilation to a child for two main reasons:

• When they are conscious, but having troubled or inadequate breathing.
• When they have stopped breathing, are unresponsive and you need to breathe for them and start CPR.

What are the signs of troubled or inadequate breathing?

• Poor or no chest rise
• Poor skin color or a drop in oxygen level (O2 sats)
• Inadequate breath sounds
• Child is frightened and struggling to take a breath
• Abnormally low respiratory rate

What are signs of a breathing emergency?

• Not breathing (apnea)
• Unconscious, non-responsive

Equipment you will need

☐ Self-inflating resuscitator bag of the correct size (infant, child, adult)
☐ Face mask of the correct size
☐ Oxygen (check the amount of gas in the tank)
☐ Shoulder roll
How do I hold the resuscitator bag?
Refer to the drawing (on the left) for proper grip of a face mask. We refer to this as a “CE” clamp. The CE clamp is the correct way to hold the mask against your child’s face and create a good seal so oxygen breaths can be given.

1. With one hand (usually your non-dominant hand), use your thumb and pointer finger (in a C shape) to hold the mask in place over the nose and mouth. Use your other 3 fingers (spread in a capital E shape) to lift the jaw and open your child’s airway. Avoid letting your finger press on the throat.
2. Then use your other hand to squeeze the resuscitator bag (with oxygen attached) to deliver the breaths.
3. Deliver 1 breath every 3 seconds. The goal is to have good chest rise and time to exhale.

Steps to take when giving bag-mask ventilation for an unconscious breathing emergency
1. Call 911
2. Place the child on their back on a flat firm surface (floor)
3. Put the shoulder roll in place. For infant, place roll under shoulders; for older child, place the roll under the neck. Turn on the oxygen to the resuscitator bag
4. Place the mask on the face and create a seal with a CE Clamp and begin bagging. Watch for good chest rise.
5. Remain calm and continue bagging until the paramedics arrive.

Steps to take when giving bag-mask ventilation for non-emergency (struggling) breathing
1. Position you child as best suited and put shoulder roll in place.
2. Turn on the oxygen to the resuscitator bag.
3. Place the mask on the face and create a seal with a CE Clamp and begin bagging. Watch for good chest rise.
4. If child does not respond and breathing does not get better, call 911.
Chest Physical Therapy (CPT)

What is CPT?
Chest Physical Therapy or CPT is a treatment used to help move mucus out of the lungs. It is one of the Airway Clearance Therapies (ACT).

The three parts of CPT are:
- Postural drainage - This involves placing the person in different positions to drain segments or areas of the lungs being treated.
- Percussion - This involves percussing (clapping) or vibrating the chest wall to loosen mucus and move it into the larger airways.
- Huffing - This is a form of controlled coughing that helps expel the mucus that has been loosened out of the airways.
  - Low Huff – A normal size belly breath is inhaled and held for 2 to 4 seconds then exhaled slowly and completely through the mouth. (Fog Mirror)
  - High Huff – A big belly breath is inhaled and held 2 to 4 seconds then exhaled fast at high speed through the mouth.

How to do CPT
1. Put your child in a position to drain part of the lung. Follow the pictures in the section on Chest Physical Therapy, Standard Positions on page 70.
2. Percuss (clap) using your hand, a soft rubber clapper, or mechanical vibrator for 3 to 5 minutes over each area being drained.
3. After each position, encourage your child to take a big belly breath followed by a low huff, a high huff and a cough.
4. Place child in the next position until you have finished all areas of the lung as prescribed.

Important tips to follow when doing treatments on your child
- Do treatment before your child eats, or wait at least one hour after eating. Treatments done right after a meal can cause nausea or vomiting.
- Keep your child as comfortable and secure as possible. Use pillows and blankets for positioning.
- If your child is having a hard time breathing, has poor color or is fighting the treatment – stop. Have child sit up, try to relax and catch their breath before continuing.
- Do not percuss (clap) over bare skin. Cover the upper body with a thin cloth or shirt.
• When percussing with your cupped hand or a soft rubber clapper, you should hear a popping sound and no red marks should appear on the chest. Percussion done correctly does not hurt your child.

• Avoid percussion / vibration on the sternum (breast bone), spine (back bone), female breast tissue, or below the ribs.

Help your child to understand the importance of doing daily CPT or other airway clearance therapy. Daily therapy helps to keep lungs clear of mucus and will help keep their lungs healthy.

**Suggested treatment plan for your child**
A Look at the Lungs and Percussion Techniques

Tracheobronchial tree

- Collarbone
- Trachea
- Upper lobe
- Lingula (left upper lobe area)
- Lower lobe
- Bronchi
- Diaphragm
- Upper lobe
- Right middle lobe
- Lower lobe
- Alveoli
- Alveolar sac (air sac)
Ways to percuss (clap)

For neonates/infants, use a manual percussor

For small children, use a CPT cup (palm cup)

For older children, use cupped hands

Percussion equipment

Mechanical vibrators

For older children, mechanical hand percussors are an option

Vest therapy

High-frequency oscillating vest for children over 3 years of age

The inflatable vest or wrap is attached to a machine that vibrates it at a high frequency. The vest vibrates the chest and helps to move mucus out of the lungs.
Chest Physical Therapy (CPT) Infant/Modified Positions

Follow these instructions daily to clear the mucus from your baby’s or child’s lungs.

To clear the upper lobes of the lungs
Front upper segments, right and left side
Percuss or vibrate over the shoulder and/or just below the collarbone on both sides of the chest. Keep your child’s spine straight and avoid slumped posture. (See picture at right.) This prevents putting pressure on the stomach, which can cause your baby to spit up.

To clear the lower lobes of the lungs
Back upper and lower segments, right and left side
Place your child on the stomach with head turned to one side. Child should be lying in a horizontal (flat) position. (See picture at right.) Apply percussion or vibration over the back, taking care to avoid the spine. Start at the shoulder blades and percuss downward to just above the lower ribs.

To clear the lower lobes of the lungs
Front and sides
Place child on right or left side, flat. Start at the armpit and percuss downward to just above the lower rib.

Percuss right side

Percuss left side

(This position is not used with children with tracheostomy tubes.)
Chest Physical Therapy Standard Positions

Back upper lobes, right and left sides
1. Place child in a sitting position, leaning forward over a pillow.
2. Percuss or vibrate over the upper back on the right and left sides. Avoid the spine.

Front upper lobes, right and left sides
1. Have child lie flat on their back.
2. Percuss or vibrate between the collarbone and nipple on both right and left sides. Avoid the breastbone.

Back lower lobes, right and left sides
1. Have child lie on their stomach in head-down position.
2. Percuss or vibrate starting at the shoulder blades and moving down to just above the lower rib. Avoid the spine.

Right middle lobe
1. Have child lie on their left side in head-down position.
2. Rotate body a quarter-turn backward, propping body with a pillow placed behind from shoulder to hip.
3. Percuss or vibrate over the right nipple. In girls with breast development, clap to the right of the nipple and below the armpit.

Front and side, lower right lobe
1. Have child lie on their left side in a head-down position.
2. Clap over lower ribs.
Front and side, lower left lobe
1. Have child lie on their right side in a head-down position.
2. Clap or vibrate over lower rib cage area.

Front left upper lobe (Lingular area)
1. Place the child in head-down position, on the right side and rotate a quarter-turn backward.
2. Clap over the left nipple. (Girls – left of the nipple and below the armpit.)

Self-percussion, upper lobes
1. Your child should sit upright and reach across their chest, to clap on front of chest over the muscular area between the collarbone and the top of the shoulder blade.
2. Repeat on the opposite site.
3. Your child can also clap their own upper back if able to reach it.
Tracheostomy Glossary

**Air compressor**
Electric device that generates air under pressure to deliver (medicine) in a fine mist.

**Alveoli**
Air sacs of the lungs where outside air (oxygen) gets into the bloodstream.

**Apnea**
When breathing stops for a short period.

**Artificial airway**
Another term for tracheostomy tube.

**Bacteria**
Germs.

**Bronchi**
The two main branches of the airway leading from the trachea to the lungs.

**Bronchioles**
Smaller airways that branch off the bronchi.

**Cannulation**
The placement of a breathing tube.

**Cap**
A cover that blocks the opening of the (trach) tube allowing the person to breath only from the nose and mouth. Used with weaning off the tube.

**Carina**
The point where the airway divides the trachea into the two main-stem bronchi.

**Catheter**
A tube used to remove mucus from the airway.

**Cilia**
Hairlike projections that line the airway and sweep back and forth to help move mucus and dust out of the airway.

**Cough assist**
A device that simulates coughing to help remove mucus from the airway.

**Cuff**
The inflatable balloon on some tracheostomy tubes. Helps direct the air from the ventilator to the lungs.

**Cyanosis**
Bluish coloration of the skin and mucous membranes especially around the lips, fingernails, gums and under the eyes due to decreased oxygen in blood. However, this may be less visible on darker skin tones. Use an oximeter at all times if one has been prescribed.
Decannulation
Removal of a breathing tube.

Diaphragm
Large muscle below the lungs that control breathing.

Dyspnea
Labored breathing, short of breath.

ENT
Ear, Nose, Throat.

Epiglottis
A thin flap that covers the entrance to the airway when swallowing to protect the lungs from food and foreign bodies.

Esophagus
Tube that connects the mouth and nose and back of throat to the stomach.

Exhale
Breathing out.

Flange (also see phlange)
The flat part of the trach tube that rests against the neck to hold the trach in place.

Glottis
Sound-producing part of the larynx. Includes the larynx and epiglottis.

Heat Moisture Exchanger (HME)
Filter device that traps the heat and moisture from exhalation and re-uses it on the next breath in.

Heated mist collar
A device that helps deliver warm, moist air to the trach tube.

Humidity
Moisture in the air to warm the airway and thin the mucus.

Hypoventilation
Less air volume and less frequent breathing.

Hypoxia
Too little oxygen in the blood.

Inhale
Breathing in.

Intubation
Insertion of an artificial tube into the airway to help with breathing.

Larynx
Voice box

Malacia
A softening of the affected tissue. “Floppy airway.”
MDI
Stands for Metered-Dose-Inhaler. Includes a canister, a plastic actuator and mouthpiece that sprays medicine into the airway and lungs. Each spray gives a set or “metered” dose of medicine.

Mucus
Slippery or sticky fluid produced in the lungs and windpipe.

Nebulizer
A machine with a small generator that puts mist and medicine directly into the airway and lungs.

Neonatal
The first six weeks after birth.

O2
The chemical term for oxygen gas. Part of the air we breathe.

Obturator
The semi-rigid guide that helps place the tube into the trachea.

Oral airway
A hard plastic device placed in the mouth to move the tongue away from the back of the throat and open the upper airway. Used in a breathing emergency where the child is unresponsive.

Oximeter
Machine that monitors the oxygen in the blood and the pulse of the person (sometimes placed on the finger or toe).

Oxygen concentrator
An electrical device that converts room air into concentrated air with more oxygen to breathe.

PCP (Primary care provider)
Your primary general care doctor.

Pharynx
The area in the back of the throat.

Phlange (also see flange)
The flat part of the trach tube that rests against the neck.

Pulmonologist
A medical doctor with advanced specialty training in pulmonary (lung) disease.

Resuscitator bag
Bag used to provide manual breaths through the trach or with a mask.

Retractions
Pulling or sucking in the chest muscles, neck muscles, abdominal muscles that can happen when one is having trouble breathing. (Note: Some kids do this at baseline.)
Saline
Salt water solution.

Sinuses
Air spaces in the bones of the face.

Speaking valve (PMV)
One-way valve that allows air through the trach during inspiration, but then shuts and then forces the air up through the vocal cords and out the mouth with exhalation to assist speech and/or swallowing.

Specimen trap
A cup designed to collect mucus that will be sent to the laboratory for testing.

Stenosis
Narrowing or constriction of the airway.

Sterile
Made free from germs through heating or cold processes.

Stoma
Hole in the neck where the tracheostomy goes.

Suction
Vacuuming up mucus and fluid through the tracheostomy tube.

Swaddle
Wrap the baby up comfortably and snugly with a light blanket with only their head sticking out.

Trachea
Windpipe.

Tracheitis
An infection of the trachea (windpipe).

Tracheostomy
Opening into the trachea.

URI
Upper respiratory infection such as a cold.

Ventilator
A machine that helps a person breathe.

Virus
A germ that is different from bacteria and can cause illness.

Vocal cords
Two strips of tissue in the voice box (larynx) that allows speaking.

Wheeze
A whistling sound made as air tries to get through a narrow inflamed airway.
Free Interpreter Services

- In the hospital, ask your child’s nurse.
- From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.

Seattle Children’s offers interpreter services for Deaf, hard of hearing or non-English speaking patients, family members and legal representatives free of charge. Seattle Children’s will make this information available in alternate formats upon request. Call the Family Resource Center at 206-987-2201.

This handbook has been reviewed by clinical staff at Seattle Children’s. However, your child’s needs are unique. Before you act or rely upon this information, please talk with your child’s healthcare provider.

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