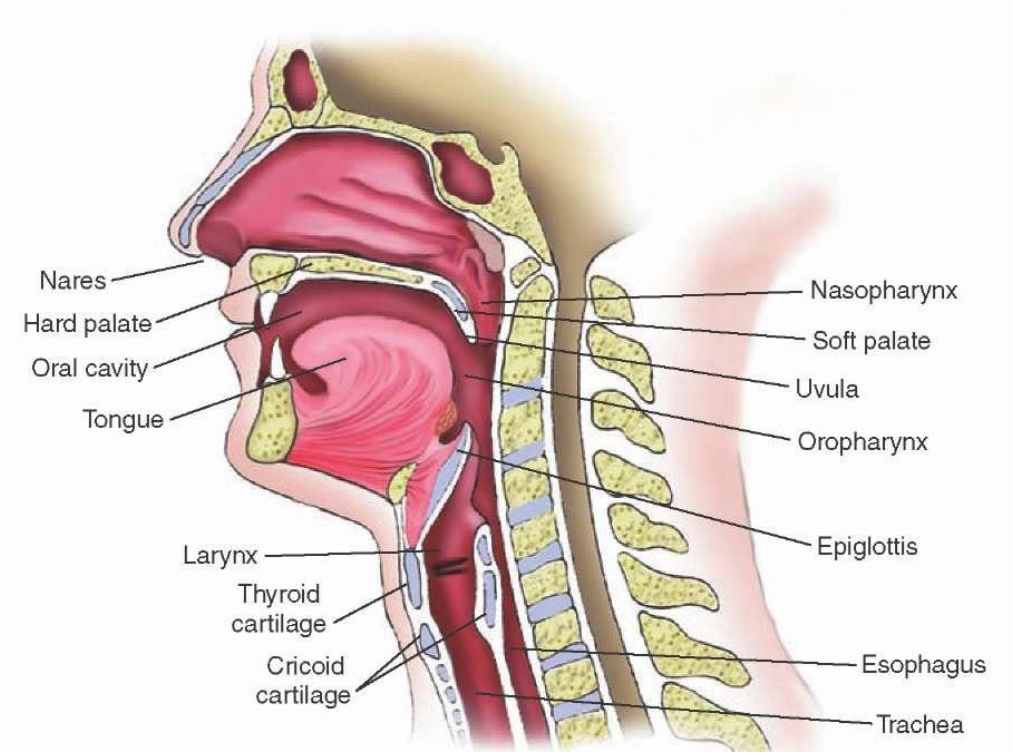
IT'S ALL ABOUT THE AIRWAY.

RESPIRATORY CARE IN THE HOME ENVIRONMENT

AIRWAY ANATOMY



INDICATIONS FOR TRACHEOTOMY

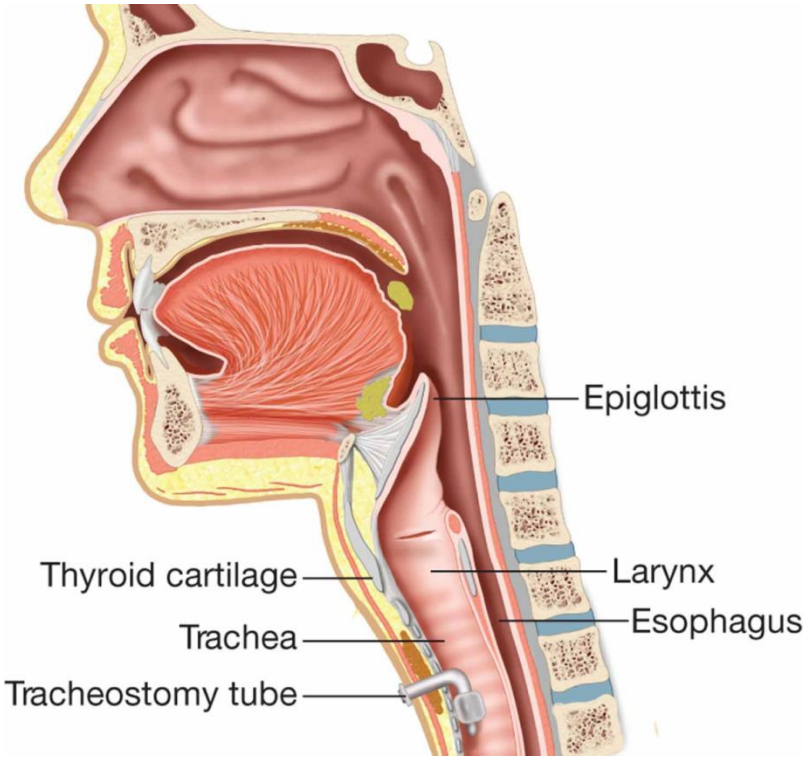
Neuromuscular Disorders

Restrictive lung disease

Broncho-Pulmonary Dysplasia

Upper airway obstruction

PLACEMENT OF A TRACHEOSTOMY



LET'S TALK ABOUT THE TRACH TUBE

Tracheotomy is one of the most frequent performed procedures annually in the U.S.

100,000 annually in the U.S.

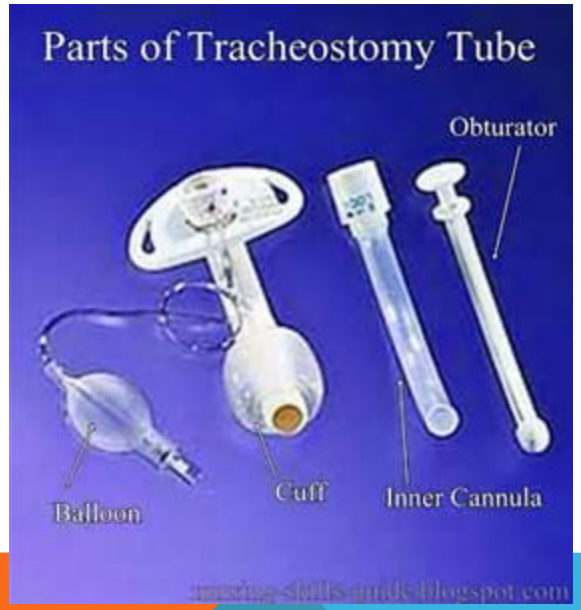
24% on critical patients that require mechanical ventilation

29 days average stay for a tracheostomized patient

$265,499 hospital charges associated with tracheostomy

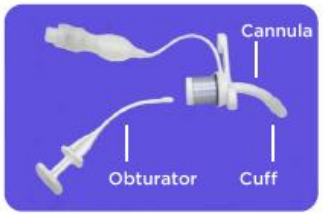
$60 Billion Expected national bill in the year 2020 associated with prolonged ventilation

WHAT'S IN A TUBE?



Tracheostomy tubes come in a variety of sizes
Most commonly used in the U.S. are Bivona or Shiley
Can be cuffed or un-cuffed
Cuffs are filled with sterile water or air
Custom trach tubes are becoming more common
understanding why we use a custom trach- Flextend
Suction depth must be monitored due to custom length
Important to know if the patient may be de-cannulated at a later date
Speaking valves can be used- passey muir valves

Cuffless tracheostomy tube



Tracheostomy tube with tight-to-the-shaft cuff

Cuffed tracheostomy tube

Suctioning with a Simple Suction Catheter

Steps for suctioning your child's tracheostomy with a simple suction catheter.

Why do we suction?

The purpose of suctioning is to keep the airway open. You will need to remove the secretions (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**.

Signs of excess mucus in the airway

There are several ways your child will show they need suctioning. These include:

- Rapid or increased work of breathing
- Coughing
- Gurgling noises
- Poor color or a drop in oxygen level (O2 sats)
- Rumbling or rattling felt in child's chest by caregiver's hand placement

Supplies

- Suction machine and connective tubing
- Simple suction catheter of appropriate size, and gloves
- Resuscitator bag connected to oxygen, for use if needed
- Normal saline packets
- Purell

Suctioning steps

- Wash hands thoroughly or use Purell before suctioning.
- Turn on suction machine and check suction pressure.
- Open suction catheter package and put on gloves. Connect catheter to suction connective tubing, being careful not to contaminate the catheter.
- Give blow-by O2 with resuscitator bag.
- Carefully but quickly insert the catheter directly into the tracheostomy tube opening.
- Pass the catheter to the preset suction depth.

To Learn More

- Respiratory Care 206-987-2258
- Ask your child's healthcare provider
- www.seattlechildrens.org

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.
- For Deaf and hard of hearing callers 206-987-2280 (TTY).

- You want the tip of the catheter to pass just beyond the end of the tracheostomy tube.
- As you withdraw the catheter, twist it around and around in the tracheostomy tube while applying suction off and on. Never spend more than 10 seconds in the tube at a time.
- Give blow-by O2 with the resuscitator bag after removing the catheter.
- If secretions are thick and hard to suction, put a few drops of normal saline into the tube to help thin secretions.
- Suction again.
- Allow child time to catch their breath between passes of the catheter.
- Rinse catheter with saline from packets.
- Repeat suction steps as needed, using saline only if secretions remain thick and hard to suction through the catheter.
- At the end of suctioning, give blow-by O2 with resuscitator bag.
- Discard catheter and saline packets.

4/14
PE1870

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Suctioning with a Closed (In-line) Suction Catheter

Steps for suctioning your child's tracheostomy with a closed suction catheter.

Why do we suction?

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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**.

Signs of excess mucus in the airway

There are several ways your child will show they need suctioning. These include rapid or increase work of breathing, coughing, gurgling noises, poor color or a drop in oxygen level (O2 stats), and/or rumbling or rattling felt in your child's chest by a caregiver's hand placement.

Supplies

- Suctioning machine and connective tubing
- Closed suction catheter, of appropriate size
- Normal saline packets
- Resuscitator bag connected to oxygen for use, if needed
- Gloves and Purell

Suctioning steps

- Wash hands thoroughly or use Purell before suctioning.
- Put gloves on.
- Pre-oxygenate your child by increasing the oxygen on the ventilator for about 30 seconds prior to suctioning.
- Unlock thumb valve so it can be depressed to start suction.
- Open normal saline packet and insert into saline port.
- Move catheter to the measured suction depth posted on the suction depth chart at the bedside. The depth will be seen in the observation window (see photo on next page).
- Apply suction by depressing thumb valve. Apply suction continuously while slowly withdrawing the catheter. **Limit suctioning time to less than 10 seconds in the tube at a time.**
- Give child a chance to catch their breath between every suctioning pass.

Suctioning with a Closed (In-line) Suction Catheter

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- www.seattlechildrens.org

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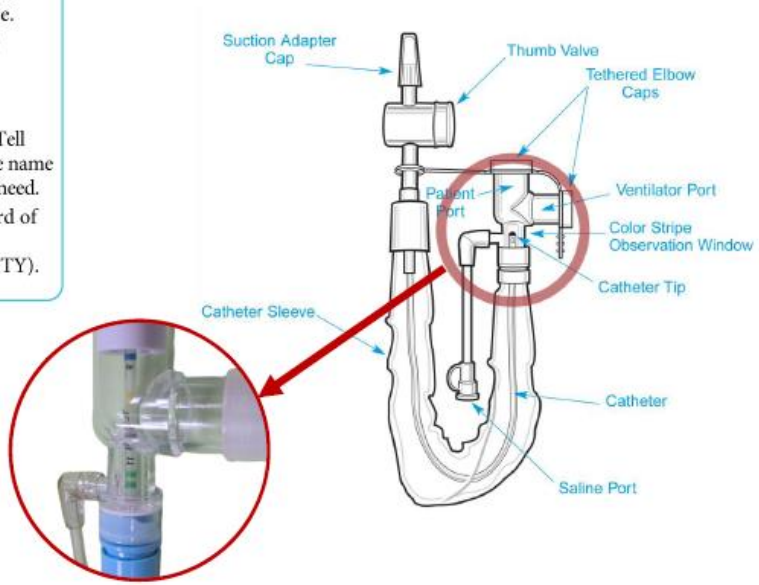
- For Deaf and hard of hearing callers 206-987-2280 (TTY).

- If mucus is thick and hard to suction, put a few drops of normal saline into the tube to help thin the mucus.
- Suction again.
- Rinse the closed suction catheter after suctioning by depressing the thumb valve at the same time you put saline drops into the saline port.
- When done with suctioning: close thumb valve, remove saline packet, and close the saline port.
- **Return oxygen to 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.

Parts of the TRACH CARE closed suction system



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PE1869

Tracheostomy Stoma Care

Daily cleaning of your child's tracheostomy stoma helps prevent infection.

Why is it important to clean the stoma?

Routine tracheostomy stoma care will decrease the chance of infection at the stoma site. Tracheostomy tie changes help reduce neck irritation.

How often should we clean it?

Clean skin and replace tracheostomy ties daily.

If skin becomes irritated, more frequent care is needed.

Equipment you will need

- ❑ Essential equipment (spare tracheostomy tube of same size and one smaller, oxygen, resuscitation bag and mask)
- ❑ syringe (for use with cuffed tubes only)
- ❑ water soluble lubricant
- ❑ tracheostomy ties
- ❑ sterile water, cotton swabs (Q tips), gauze or clean wash cloth
- ❑ small cup for water
- ❑ stoma dressings
- ❑ medicine for the skin if ordered

Steps to cleaning the stoma

Prepare your child's stoma

1. Get a trained helper. Routine stoma care requires two people.
2. Wash hands.
3. Pour the sterile water into a small cup.
4. 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 stoma.

Clean stoma and neck

5. Have one person hold the tracheostomy tube in place while the other person cleans the neck and removes the dirty ties.
6. Moisten cotton swabs with water and clean around the stoma site, rolling the swab away from the stoma. The swab should then be discarded. Use a new swab to dry the stoma site.
7. Use a clean, soft washcloth or gauze to wash the remaining neck area.

To Learn More

- Respiratory Care 206-987-2258
- Your child's healthcare provider
- www.seattlechildrens.org

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Inspect the site and re-secure with ties

8. When the tracheostoma ties are off you have a better view of the stoma site and neck. You should be checking for skin redness, irritation and breakdown.
9. 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. One finger should fit in between the tracheostomy tie and the neck.
10. Velcro ties can be reused. Wash dirty ties in mild soapy water, rinse and air dry. Before reusing the ties, check to see that velcro is still intact.
11. If an open sore develops or you smell an odor around the stoma, clean and dry the area at least every eight hours.
12. If skin breakdown or odor persists, contact your doctor. If the doctor orders a medicine, apply it carefully at the stoma site or around the neck.

5/13
PE1450

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Tracheostomy Tube Change

Steps to follow when changing your child's tracheostomy tube.

Why is it important to change the trach tube?

Routine tracheostomy tube change minimizes the chance of infection.

How often should we change it?

Change the tracheostomy tube monthly unless the doctor orders more frequent changes.

Equipment you will need

- ❑ Essential equipment (spare tracheostomy tube of same size and one smaller, suction, oxygen, resuscitation bag and mask)
- ❑ Syringe (for use with cuffed tubes only)
- ❑ Water soluble lubricant
- ❑ Tracheostomy ties
- ❑ Sterile water, cotton swabs (Q tips), gauze or clean washcloth
- ❑ Small cup for water
- ❑ Stoma dressings
- ❑ Medicine for the skin if ordered

Steps to take when changing the tracheostomy tube

Prepare the tube

1. Get a trach-trained helper. Routine tracheostomy tube change requires two people.
2. Wash hands and check to see that you have everything you need.
3. If using a cuffed tube, check its function by inflating and deflating the cuff before you use the tube.
4. Insert the obturator into the tube. It will help guide the tube into the stoma.
5. Apply a thin film of water-soluble lubricant to the cannula.

Remove the old tube from child's stoma

6. Place child on their back with a blanket roll under their shoulders. This will cause the 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 their trach.
7. One person holds the trach tube in place while a second person removes the trach ties.
8. Before removing a cuffed tube deflate the cuff.
9. Suction your child with oxygen if needed.
10. The person holding the trach tube rolls the tube forward and down out of the stoma.

Place new tube

11. The second person inserts the clean trach tube into the stoma. The tube should slide into place as you apply gentle inward pressure.
12. Remove obturator.
13. Your child may cough and you should feel air passing in and out of the tube.
14. Check the tube placement by passing a suction catheter to the routine depth.
15. Inflate the cuff if in use.
16. Clean the tracheostomy site as usual. (see Tracheostomy Stoma Care PE1450)
17. Secure the tube with clean ties.
18. Clean the obturator and place it in a clean bag with the spare tubes.

COUGH ASSIST

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Cough Assist T70 for the Tracheostomy Child

with or without a ventilator

The Cough Assist T70 device removes secretions from your child's lungs through the use of mechanically applied pressure. The machine gradually applies a positive pressure to the airway, then rapidly shifts to a negative pressure. The rapid drop in pressure forces air from the lungs, imitating a natural cough.

The Cough Assist can be applied directly to the tracheostomy tube with a trach adapter or an inline suction catheter. Using an inline suction allows for easy removal of secretions from the tracheostomy tube.

Tracheostomy tube with Cough Assist

Tracheostomy tube with inline suction catheter and Cough Assist

Oxygen can be added to the Cough Assist tubing in between the filter and the tubing.

T **For child with trach only**:
Give blow-by O_2 with resuscitator bag or increase the oxygen on the mist collar before doing the treatment.

V **For child on a ventilator**:
Increase the oxygen setting prior to the Cough Assist treatment as directed.

Steps to using Cough Assist

Get your child ready:

1. Gather suctioning supplies.
2. Place your child in an upright sitting position as tolerated.

Start the treatment:

1. Turn on the Cough Assist and check the settings and pressures. Turn on the oxygen to the Cough Assist device.

V **For child on a ventilator**:
Disconnect the ventilator circuit from the elbow of the inline suction at full inspiration (when lungs are full of air) and set aside in easy reach.

Attach the Cough Assist tubing and immediately start the treatment by pressing Therapy. The Cough Assist device will cycle automatically from inhalation (positive, pushing air in) to exhalation (negative, sucking air out). At the end of exhalation the machine will pause before the next breath.

If your child has a cuffed tracheostomy tube, inflate the cuff during the cough assist treatment.

Always watch to see that your child is tolerating the treatment and getting good chest rise.

2. Suction

   Simple Suction: If your child needs to be suctioned during the treatment, disconnect the Cough Assist tubing at the end of exhalation and suction as needed. Allow your child time to catch their breath and then resume the treatment if needed. If your child requires a simple catheter, use support with resuscitation bag and with O_2 between Cough Assist cyles.

   Inline Suction: Suction just at the top of the tracheostomy tube if you see secretions during the Cough Assist treatment.

3. After 5 in/out breath cycles on the Cough Assist:
   - Disconnect the Cough Assist tubing from the trach.
   - Switch the Cough Assist device to Standby.

T **For child with trach only:**
Suction the trach and allow your child to resume normal breathing. Place your child back on the heated mist collar or current humidifcation device.

V **For child on a ventilator:**
Place your child back on the ventilator. Suction the trach with the inline catheter and allow child to resume normal breathing.

Do not keep your child connected to the Cough Assist device longer than the prescribed amount of time.

4. Repeat the steps above 3 to 5 more times as needed to clear secretions. If secretions are thick and hard to suction, just before attaching Cough Assist, put a few drops of normal saline into the tube (or into the port of the inline suction catheter if you are using that).
5. After the treatment:
   - Turn off the O_2 source to the Cough Assist.
   - Move the oxygen setting back to the normal setting on the ventilator or mist collar.
   - Discard used suction supplies. Turn off the Cough Assist.

To Learn More

- Respiratory Care 206-987-2258
- Ask your child's healthcare provider
- www.seattlechildrens.org

Free Interpreter Services

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- From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.

Cough Assist Settings

(to be filled out by your healthcare providers)

Mode _____

Cough Trak _____

Flow _____

Inspiratory pressure _____

Expiratory pressure _____

Inspiratory time _____

Expiratory time _____

Pause _____

Oxygen _____ L/M (liters per minute flow rate)

2/15
PE2057

TRACHS AND VENTS

Frequently an individual who will required long term ventilator support will have a tracheostomy.

Optimal ventilation can be accomplished when an individual has a cuffed tube.

The long term goal is to successfully de-cannulate a patient if possible.

LTV VENTILATOR

LTV 950 not supported after December 2016

Patient's on the LTV transferring to Trilogy

Short battery life- 1 hour

Noisy

LTV 1150 did not address the battery problem, not a suitable replacement for the LTV 950

VENTILATOR SETTINGS

Rate: The number of breaths per minute the vent will deliver. Often a patient will breath over the set rate.

Tidal Volume: The amount of air delivered with each breath.

Peak Pressure: The pressure required to deliver a breath. Can be volume or pressure regulated.

Pressure Support: Supplemental pressure delivered during a spontaneous breath.

PEEP : PEEP stands for positive end expiratory pressure in a ventilated patient. PEEP is the pressure remaining in the circuit at the end of the delivered breath. The intent of PEEP is to keep the airways open.

ITIME: Inspiratory time is the amount of time allotted for the volume or pressure to be delivered.

SIMV: Synchronized intermittent mandatory ventilation allows for patients to breath spontaneously between mandatory machine breaths

TRILOGY VENTILATOR

Uses a microprocessor with a sophisticated algorithm

Battery life- 6 hours

Usually need to bag in medications

Uses a single limb heated circuit

- Passive or active proximal airway pressure circuit
  - Active circuit has a leak test

Active flow circuit not in use in the home environment.

Must keep exhalation port free of obstruction.

Vent alarm “low circuit leak” check exhalation port.

VENTILATOR CHECKS

As ordered, normally Q4

Verify all settings are as prescribed

Become familiar with the patient's normal readings

Caregivers should have the necessary contact numbers should a problem occur with the ventilator

Bagging as a back up if needed

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 O_2/bag and mask
Call 911

GOT MUCUS?

SUCTION
May need to ↑ O_2, use saline, resuscitator bag and cough assist

EQUIPMENT PROBLEM?

FIRST: Make sure child is OK
Support with O_2/bagging if needed
THEN: Troubleshoot to identify problem
NEXT: Fix or call equipment company for help

! If your child loses consciousness, START CPR !

7/15
PE1941

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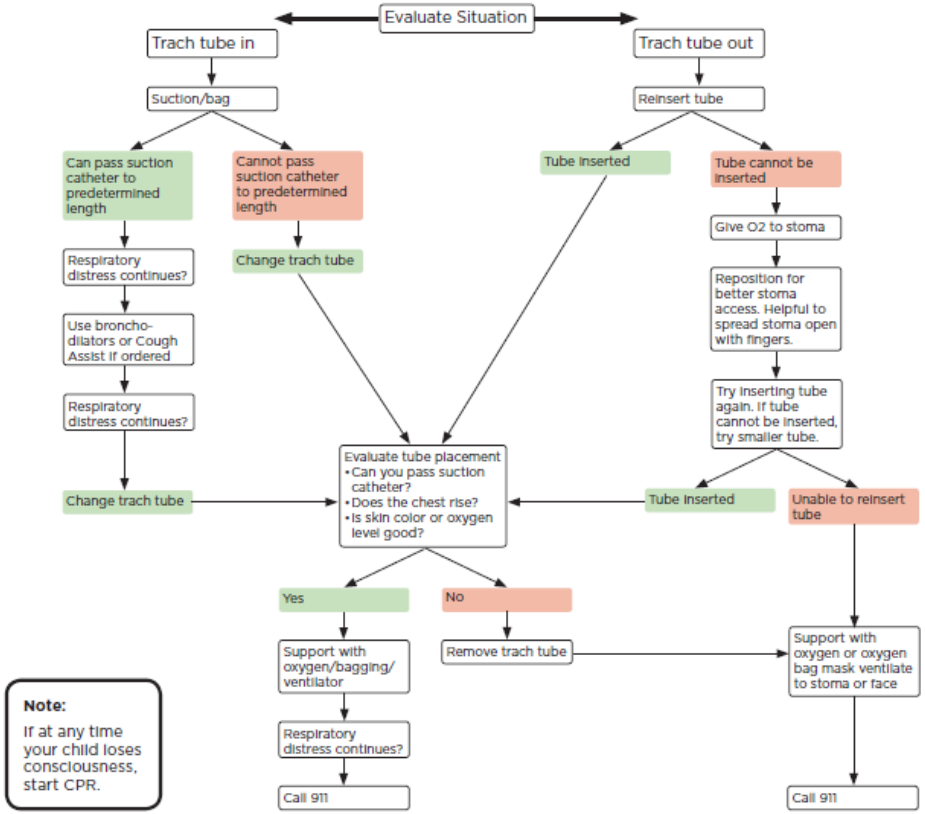
Emergency Airway Management — Tracheostomy

Child is showing signs of respiratory distress

- Increased work of breathing, respiratory rate, retractions
- Poor color, drop in oxygen levels
- Whistling or wheezy sounds from trach
- Increased vocalization around trach tube
- Agitated/upset

Always have essential equipment

- Spare tracheostomy tube of the same size, and a smaller tube
- Syringe (for cuffed tubes only) and lubricant
- Suction equipment and supplies
- Resuscitation bag and mask - oxygen



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

7/13
PE1529

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Patient and Family Education

Essential Trach/Vent Equipment for Home and "To Go"

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.

Consider using a back pack for your equipment "to-go" bag. In this photo, mom labeled each pocket's contents.

Essential Trach Equipment and Supplies

- ❑ trach tube the same size as the child's, plus a tube one size smaller
- ❑ sterile lubricant and tracheostomy ties
- ❑ syringe if needed for cuffed tube and blunt scissors
- ❑ portable suction, fully charged, with AC power cord
- ❑ suction catheters and saline packets
- ❑ gloves and hand sanitizer
- ❑ oximeter, fully charged, with AC power cord
- ❑ oximeter cable and finger probe
- ❑ oxygen tank (check the amount of gas in the tank)
- ❑ resuscitator bag with O2 tubing
- ❑ resuscitator bag face mask and stoma mask
- ❑ Heat Moisture Exchanger (HME)
- ❑ letter with medical history, doctor's contact information and emergency numbers

Essential Vent/BiPAP Equipment and Supplies

If your child is dependent on a ventilator or BiPAP machine, make sure you have:

- ❑ ventilator, BiPAP or CPAP machine with AC power cord
- ❑ fully charged batteries (internal, detachable and external)
- ❑ battery cables and car adaptor
- ❑ an extra complete tubing circuit with oxygen tubing

For questions ask:

- Respiratory Care 206-987-2258
- Your child's healthcare provider
- www.seattlechildrens.org

4/14
PE1449

QUESTIONS???????

Lexine Cook RRT LRCP

Phone: 425 482-4213

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