

TRACHEOSTOMY CARE AND PROCEDURES

Overview

Neurological and anatomical impairments may affect a person's respiratory function. Because adequate respiratory function is essential for life, specialized procedures may be needed to allow ventilation to take place. One such procedure is a tracheostomy – an opening from the surface of the skin into the trachea which provides an alternative route for the passage of air and secretions.

Caring for a person with a tracheostomy is a delegated nursing function therefore a registered nurse must ensure the caregiver is competent to perform the care required. The following module describes the routine care needs as well as emergency procedures should the tube become blocked or dislodged.

Outline

1. What is a Tracheostomy?
2. Trach Tube change
3. Trach Ties
4. Tracheal Instillations
5. Reasons for Humidity
6. Suctioning Procedure
7. Emergencies and Illness
8. Resuscitation Bag and Performing Artificial Respirations.

Outcome Objectives

After reading the following module you will be able to:

- Explain what a tracheostomy is and why clients may require a trach tube.
- Explain and demonstrate a trach change, trach ties, tracheal instillations, and suctioning technique
- Explain how to assessment if client requires suctioning and if it has been successful.
- Explain and demonstrate emergency procedures especially use of resuscitation bag.

What is a tracheostomy?

A tracheostomy is a surgical procedure creating an opening through the neck (skin) into the trachea.

Tracheostomy Tube

The purpose of a tracheostomy tube is to maintain a patent airway and/or provide secretion clearance and an alternative route through which air enters the lungs for a client with special respiratory needs.

The established trach tube is changed on a regular basis – usually every 6-8 weeks by a health care professional (nurse or respiratory therapist). It may also require a change in an emergency i.e. unsuccessfully cleared mucus plug causing breathing difficulty, or if it accidentally comes out. It is then changed immediately by trained care-giver.

The tracheostomy tubes used most frequently are called shiley tubes. These are made from synthetic plastic and come in a variety of sizes.

Trach Tube Changes

Routine trach changes are done at the home or the hospital. If done at home, it requires two people to do it. For a well-established trach, most clients can breathe without the tube for a while during the procedure, so there is no need to panic and rush this procedure.

The trach tube should be changed before a meal, to prevent vomiting and aspiration.

Equipment needed for a tracheotomy tube change are :

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| 1. Suction machine with catheter attached | 5. KY gel |
| 2. Oxygen | 6. Trach ties |
| 3. Resuscitation bag (Ambu-bag) | 7. Gauze |
| 4. New Trach tube (original size and one size smaller) | |

Procedure

1. Gather equipment.
2. Always have an assistant help you. Wash your hands
3. Prepare the client, lying in bed with head up and pillow under the shoulders or sitting up in wheelchair with headrest off.
4. Prepare the ties and new tube for insertion. Open up sterile package with the tracheostomy tube and ensure that the obturator can slide in and out easily (the obturator is used to guide and direct new trach tube into position). Do not touch parts of the tube which will enter the stoma.
5. The assistant should stand behind the client's head, hold the flange with two fingers, and reassure the client throughout the procedure.



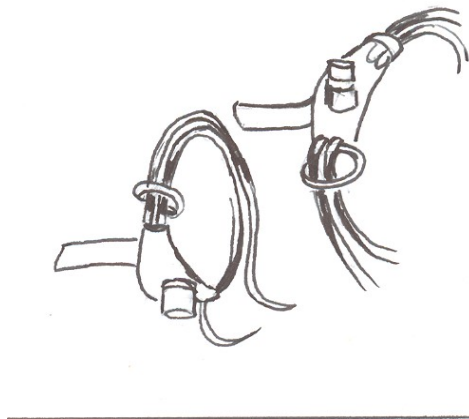
6. Suction the client.



7. Remove the old ties.
8. Hold the new tube in your dominant hand. Ensure obturator is at the end of the tube.
9. Dip the end of the new trach tube in the normal KY gel. (Do not use any other solution or gel because it contains chemicals that will irritate trachea/throat.)
10. With your non-dominant hand, remove the old trach tube, the action is similar to removing a gas nozzle - curving slightly up and out.
11. Insert the new trach tube (direct it back and downward - like inserting the nozzle of the gas pump) and immediately remove the obturator.



12. Your assistant should now be holding the flange of the new trach.
13. Allow the client a few moments now before proceeding as they may cough - suction as needed.
14. Once the client has settled - do skin care and apply new trach ties (refer to trach ties procedure).
15. Nurse Clinician will assess lung function by auscultation after the trach change is complete to assure that tracheostomy tube is in place (to rule out interstitial insertion).



Trach Ties

The purpose of trach ties is to hold the trach tube in place once it is inserted, hence preventing dislodgement. These are changed weekly and when they have become wet/dirty, to keep skin intact and free from infection. The trach ties are called “posies”.

If skin breakdown problems occur one may use a foam, wide tubing or equivalent over the ties to protect the skin.

Procedure

1. Gather equipment:
 - New trach tie.
 - Gauze for cleaning if necessary.
 - New key hole tracheostomy dressing gauze.
2. Prepare the client who may be sitting up in bed or wheelchair without headrest. Place a pillow or towel roll under the shoulders to hyper-extend the neck.
3. Prepare the client who is well positioned in bed or wheelchair.
4. Wash hands. Suction if secretions present.
5. Position the posey around and behind the neck.
6. Thread one end of the tie through the opening at the side of the flange. Fasten Velcro.
7. Repeat same on the other side.
8. Adjust the posey to ensure that it is securely fastened and snug around the neck.
9. Remove the old posey.
10. It is vital that the posey is snug around the neck, not too tight or too loose. You should be able to slip two fingers under the posey.
11. Wipe away any secretions on the neck. Apply new trach dressing.

Tracheal Instillations

Instillations of sterile normal saline are used to loosen thick secretions – to make the clearing of secretions through coughing or suctioning easier. Only sterile normal saline is used for tracheal instillations. Do not use tap water or any other solution.

Frequency

When tracheal instillations should be done is very individual. Please refer to the client's care plan.

Instillations may be required:

- In the morning, upon rising because secretions can be thicker
- At bedtime
- Before suctioning especially if secretions are thick and difficult to clear.

Volume

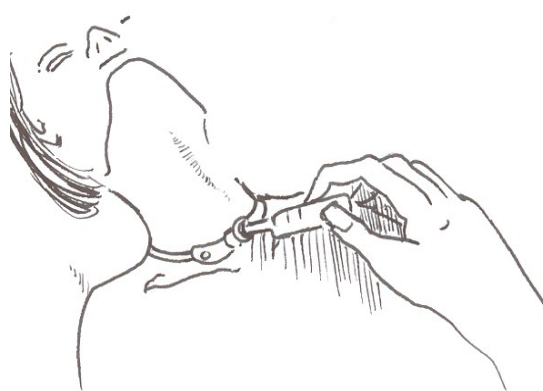
The amount of sterile saline to be instilled is determined on an individual basis and documented in the client's care plan. The decision depends on the client's:

- Age & body weight
- General size
- Consistency of secretions

After the instillation of saline allow the client to take a few breaths before suctioning.

Remember suctioning always follows tracheal instillations unless the client has cleared the secretions with a strong cough.

"ALWAYS USE STERILE NORMAL SALINE NEBULES"



Humidity

Adequate humidity (moisture) is an important part of the client's tracheostomy care.

The nose and throat have three primary functions: 1-warms up the air we breathe

2-moisturizes the air we breathe 3-filters the air we breathe.

Humidity helps to keep mucus thin and easy to cough up or suction.

This is not true when air is breathed through the trach tube. Therefore, it is necessary to add humidity using artificial means to the air that is breathed by a client with a tracheostomy.

The type of environment will be a factor in how much humidity the client will require, i.e. dryer environments call for more humidity.

A client with a respiratory infection and more secretions may also require more humidity.

Only use distilled water when using humidifiers. Never leave the humidifier on when not in use. And check the water level frequently when in use to ensure it does not run dry.

It is very important to provide adequate humidity to a client with tracheostomy tube to

a) Provide moisture to loosen secretions so the tube does not get blocked b) to keep lungs healthy.

Humidity is provided in three ways:

1. Room humidifier.
2. Distilled water in a bottle attached to an oxygen concentrator (if receiving oxygen for treatment)
3. Humidivent (which attaches to the tracheostomy tube).

Heat and Moisture Exchange

This humidification device, known as portex, humidivent, thermal, humidifying filter or Swedish nose, is attached directly to the tracheostomy. This device traps *moisture, filters air and conserves heat*. It works as follows:

The paper filter, traps the moisture from the client's exhaled air, then during inspiration this trapped heat and moisture are re-inhaled. The heat and moisture exchanger should be replaced every 24 hours or as needed to prevent accumulation of secretions.

This device can only be used when there is 1:1 supervision available. Reason: The device may become blocked with mucus and if the client is unable to remove it, he/she will be unable to breathe.

Suctioning the Tracheostomy Tube

The purpose of suctioning is to maintain a patent airway. It is a clean procedure and should follow universal precautions (non-family caregivers are required to wear gloves).



The procedure should be completed within 8-10 seconds from insertion of the catheter into the tracheostomy tube to withdrawal of the catheter from the tracheostomy tube.

The suctioning procedure should be repeated until airway is clear of mucus. Remember to allow 30 seconds (at least) between suctionings to give the client time to recover and re-oxygenate (to settle and catch their breath).

Suction machine pressures should be adjusted accordingly to the client's age and respiratory condition. For routine suctioning via the tracheostomy tube the following pressures should be used:

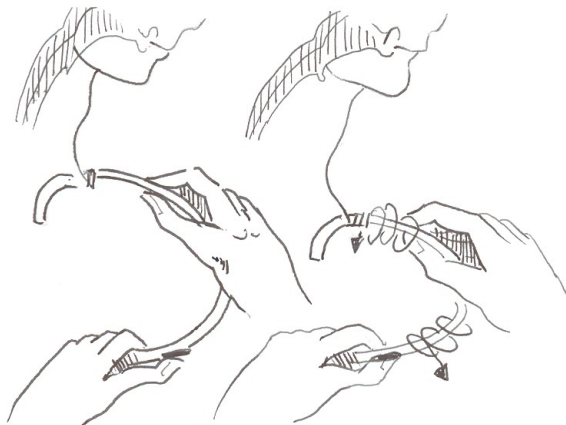
| | |
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| Infant | 60-80mmHg |
| Children | 80-100mmHg |

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| Older teens & adults | 80-120mmHg |
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If you alter the pressure ensure that the least amount of suction is being used to clear the secretions, especially thick secretions. Too much suction can cause the lungs to collapse, too little pressure will be ineffective. You can check the adequacy of pressure in the suction machine by dipping the catheter into a cup filled with water prior to starting the procedure.

Procedure

1. Gather Equipment Needed:
 - Suction machine with appropriate size catheter
 - Disposable gloves
 - Bottle of saline/boiled water to rinse catheter and tubing
 - Saline for instillation, if needed
 - Kleenex/Gauze
2. Wash hands, apply disposable glove to dominant hand, this is now the “clean” hand and should not touch anything but the suction catheter.
3. Switch suction machine on using other hand and carefully remove the catheter wrapper ensuring only gloved hand is touching catheter tube.
4. Ensure suction machine is working well by applying suction when the thumb of ungloved hand is placed on hole of suction catheter. Should be able to see and hear water running through tubing.
5. Explain to client what is about to happen. Ensure thumb is off hole in suction catheter so no suction is being applied. Advance catheter into tracheostomy tube to desired length – usually 1-2 cm beyond the end of trach tube. Deep suctioning should only be used to clear mucus plugs by nurse clinician/respiratory therapists.
6. Withdraw the catheter $\frac{1}{2}$ - 1cm before applying suction to prevent tracheal trauma.
7. Apply suction, by covering vent hole with thumb, during withdrawal of catheter. Twist or rotate suction catheter during withdrawal.



8. If mucus is bubbling at the tracheostomy tube opening then suction first.
9. When procedure complete, rinse suction catheter and tubing by suctioning some water. Wipe any mucus from end of the catheter with Kleenex, switch machine off and insert suction catheter back into wrapper.
10. Assess need for further suctioning and repeat suctioning procedure as needed.
11. Dispose of glove and any unused instillation saline.

12. If mucus is thick, saline instillation may be needed to loosen up secretions. (Refer to instillation procedure) and remember if client does not give an adequate cough after instilling saline then the trach tube must be suctioned to clear the secretions.
13. Report any changes in secretions or frequency of suctioning to nurse consultant i.e. note colour, consistency and amount of secretions.

Remember:

1. Never use the same catheter for both tracheal suctioning and mouth/nasal suctioning.
2. A catheter is replaced at least once per 24 hour unless client has a chest infection or requires frequent suctioning.
3. Water bottle to rinse catheter will be changed at end of shift.

EMERGENCIES AND ILLNESSES

1. *Airway Obstruction*

a) Signs:

- colour change
- wheezing
- not breathing (no air movement felt)
- chest heaving
- suction catheter won't pass easily or at all

b) What to do:

- Take out inner tube to clean out mucus plug
- Try suctioning after tube is cleaned & reinserted
- If bronchodilator is required administer by fitting nebulizer over trach tube
- If symptoms persist, provide O₂ via trach mask (6-10L/Min) call Nurse On-Call for further instructions
- If acute distress is present, call 911

2. *Dislodged Trach Tube*

a) Signs:

- trach tube comes out partially
- trach tube comes out completely

b) What to do:

- Stay calm
- Reinsert tube if partially out, replace with new tube if completely out and stay calm.

3. *Bleeding*

a) Signs:

- secretions are slightly pink
- secretions are bright red

b) What to do:

- If secretions are pink, suction less frequently and rotate catheter more gently. Inform nurse as soon as possible.
- If secretions are bright red, stop suctioning and inform nurse immediately.

4. *Chest Infection*

a) Signs:

- noisy breathing
- increased coughing
- laboured breathing
- respiration rate increases
- O₂ Sat decreases below client's normal range
- Change in secretions i.e. mucous is thicker and green-yellow has an odor or is more plentiful
- Fever, listlessness, poor color

b) What to do:

- Inform Nurse immediately
- Provide care as directed by Nurse Consultant

Ambu-Bag (Resuscitation Bag)

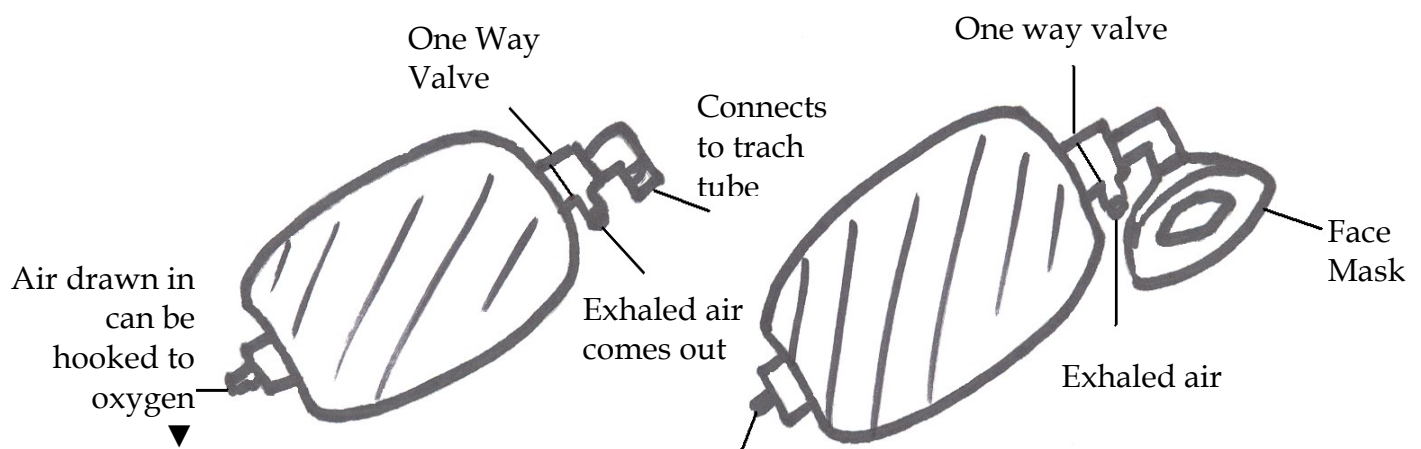
An ambu-bag is used to provide artificial respirations to a client who has stopped breathing. It can be attached to a face mask (for mouth to mouth) or in the case of a client with a tracheostomy tube connected directly to the trach tube. When using the ambu-bag for mouth to mouth, you still need to ensure the head is tilted back to open the airway, remember to hold the mask in place. This ensures the lungs are being inflated adequately. If you are unable to hold the mask in place and maintain correct head position you should perform mouth to mouth without using the ambu-bag and mask. For a client with a tracheostomy tube you do not need to do a head tilt. The ambu-bag is connected directly to the trach tube, which goes directly into the airway. Suctioning the trach tube prior to connecting the ambu-bag will ensure the tube is clear of mucus.

The ambu-bag is gently squeezed to “pump” air into the lungs just as if you are blowing air in to inflate the lungs. The bag only needs to be squeezed enough to allow the chest to rise. This produces the inhaled breath. Releasing your squeeze then produces the exhaled breath. Wait for exhalation and for the bag to refill, and then repeat.

There is a one way valve on the ambu-bag that allows air in to the client while preventing the exhaled air from entering the bag to be re-breathed. Therefore the client receives a fresh breath every time just as if he was breathing normally.

Performing Artificial Ventilations (Respirations)

1. If providing respirations to a trach tube, remove the white rubber cap that covers the corrugated port and attach this port to the trach tube. If doing mouth to mouth, position the client’s head correctly and place the mask over their nose and mouth.
2. While maintaining an open airway, gently squeeze ambu-bag to administer 2 ventilations.
3. After 2 ventilations, check the pulse via carotid artery for 10 seconds.
4. If pulse is present then continue to administer one ventilation every 3 seconds (1-1000, 2-1000, 3-1000) until such time as spontaneous respiration is restored, or until more qualified help arrives to take over, or until you must perform CPR.
5. Continue to monitor the pulse as well as be ready to suction the trach tube or mouth should the need arise as a result of mucus plug or vomiting, etc.



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