Tracheostomy Care in the Home
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Disclaimer
Appendix 3 Declaration of Vested Interest Form

Name of presenter: Heather Murgatroyd RRT RPSGT
Name of employer: DeVilbiss Healthcare

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I recognize that I must follow all guidelines and criteria regarding vested interest.

[ ] No, I have no real or perceived conflicts of interest that relate to this presentation.

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Describe real or perceived conflicts of interest that relate to this presentation:

I am an employee of DeVilbiss Healthcare and we manufacture respiratory home care equipment.

My presentations are not product specific but relate to the principles involved in best utilizing certain technologies in the home environment.

Polling Question 1

Tracheostomy refers to:
A. The procedure of opening the trachea
B. A permanent opening in the neck created by suturing skin flaps onto the tracheal walls
C. A surgically created opening in the stomach that allows waste and or urine to leave the body
D. A curved tube that is placed in the windpipe
Tracheotomy vs. Tracheostomy

Tracheotomy - operation of “opening the trachea”

Tracheostomy – root word *stoma* – “permanent opening in the neck created by suturing skin flaps onto the tracheal walls”

Procedure has been performed for thousands of years
First described in 1909 – open surgical tracheostomy
Percutaneous dilatational tracheostomy first performed in 1985

Polling Question 2

The most common reason patients have a tracheostomy is:
- A. Obstructive Sleep Apnea
- B. Ventilator dependent > 1-2 weeks
- C. Throat Cancer
- D. COPD

Why a Tracheostomy?

- Upper airway obstruction
- Provides a patent airway
- Long-term intubation or ventilatory support
- Bronchial hygiene – poor/no cough
- Airway protection
- Throat cancer
- Obstructive Sleep Apnea

Most Common Reason

From the National Institutes of Health, the most common reason for a tracheostomy is:
- Ventilator dependence > 1-2 weeks

Polling Question 3

A tracheotomy is only done in the operating room.
A. True  
B. False

Tracheotomy Procedure

- May be done at bedside, typically ICU, or in operating room
- 2 types – Open Surgical and Percutaneous Dilation Technique
- Sub-types with each general technique

Open Surgical (OS)

- Typically performed in operating room with patient under general anesthesia
- 2 types – removal of a tracheal ring to create stoma or by creating a stoma with a flap of skin from the tracheal wall
- May be more appropriate for patients with coagulation abnormalities, needing high levels of oxygen support, unstable cervical spines, large necks, poor neck mobility
- More expense due to operating room costs
- Use general anesthesia
- Some evidence of higher post operative complications

Percutaneous Dilation Technique (PDT)

- Considered minimally invasive
- Can be done at bedside
- Shorter time for the procedure then open tracheotomy (5-15 minutes)
- Do not need to transport patient to surgical suite
- Less expensive due to not using surgical suite or anesthesia services
- Not done on children <12 years
- Not performed on obese patients
- Not performed on patients with severe coagulopathies

http://www.hopkinsmedicine.org/tracheostomy/about/bedside.html
Trach Tubes

- Tubes may be plastic or metal (not as common now)
- Cuffed or uncuffed
- Fenestrated
- Single or dual cannula
- Each has specified outer-diameter, inner-diameter and length

Polling Question 4

The intra cuff pressure of a cuffed tracheostomy tube remain between:
A. 12-18 mmHg
B. 15-25 mmHg
C. 20-25 mmHg
D. 24-30 mmHg

Talking about Trach Tubes

Cuffed
- Protect against aspiration
- Allow for more effective positive pressure ventilation
- Allow for airway clearance
- Various types – high pressure/low volume, low volume/high pressure, foam
- Intra cuff pressure should be maintained 20-25 mm Hg.

Uncuffed/cuffless
- Allow for airway clearance
- Do not offer protection against aspiration
- Can be used for long-term ventilation
- Allows patient to speak

Fenestrated
- Allows patient to speak without valve when capped
- May make adequate mechanical ventilation difficult
- May allow for aspiration
- Granuloma may form at the site of hole
- When inner cannula removed and tube is capped, PT is able to breath through upper airway
- Cuffed or uncuffed tubes

http://www.hopkinsmedicine.org/tracheostomy/about/types.html
http://www.rcjournal.com/contents/04.05/04.05.0534.pdf
Trach Tubes

**Single Cannula**
- Appropriate for temporary tracheostomy during critical illness

**Dual Cannula**
- Inner and outer cannula
- Inner cannula can be disposable or reusable – hypothesized that the ability to clean inner cannula may reduce incidence of ventilator-associated pneumonia
- Inner cannula reduces the inner diameter of the trach tube – which may lead to increased work of breathing for the spontaneously breathing patient.
- In the event of obstruction, the inner cannula can be quickly removed

http://services.aarc.org/source/DownloadDocument/Downloaddoc/04.05.0497.pdf

Benefits of Tracheostomy

- Increased patient comfort, mobility, ability to communicate and take in oral nutrition and medication
- Reduction of sedation needs
- Less laryngeal stenosis/voice damage
- Decreased dead space and airway resistance
- Increased ease of suctioning
- Allows for better oral care

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2769112/
http://services.aarc.org/source/Downloaddoc/04.05.0483.pdf

Risks

Safe procedure – but not risk free!
- Bleeding
- Infection
- Pneumothorax
- Subcutaneous emphysema
- Damage to the trachea or esophagus
- Fistula
- Obstruction from clots
- Abnormal tissue growth in the trachea

http://www.mayoclinic.com/health/tracheostomy

Psychological Aspects

- Altered body image*
- Anxiety, fear and panic – in large part due to limited ability to effectively communicate
- Change in self-concept due to loss of speech

Let’s go home!

Caring for a Patient with a Tracheostomy

• There are few controlled studies or peer-reviewed papers addressing proper care and management of tracheostomies.

• Recent clinical practice statements were developed by consensus

Consensus Panel

• Convened by the American Academy of Otolaryngology–Head and Neck Surgery Foundation

• Participants from various disciplines – Otolaryngology, Respiratory, Nursing.

• Consensus was taken from pediatric and adult tracheostomy applications

• After extensive literature review, panel developed 77 consensus statements regarding tracheostomy care in adult and pediatric patients daily care
Education

- VITAL of both patient and caregiver(s)
- Prior to procedure and discharge to home
- Should include:
  - Signs of respiratory distress, infection, skin breakdown
  - How and when to suction
  - How and when to clean tube and area around
  - How and when to change tube
  - How to use associated equipment (suction, humidification, nebulizer, etc.)

Supplies

- Readily available – i.e. at bedside
- Checklist of emergency supplies
- Contact numbers of DME, physician, other health care providers

Teaching Tool (example)

Caring for a tracheostomy

- Dual cannula tubes may make cleaning easier, but may also increase airway resistance due to narrower diameter
- Recommended cleaning agents have been hydrogen peroxide, diluted acetic acid, commercial medical disinfectants, soap and water
- Schedule for changing supplies often evolves from patient’s third-party replacement schedule
Polling Question 5

What is/are the clinical goals of suction therapy?
A. Bronchial/Oral hygiene  
B. Airway clearance  
C. Infection control  
D. All of the above

Clinical Goals of Suction Therapy

1. Bronchial / Oral Hygiene - when a patient is unable to properly clear secretions a suction procedure is necessary to promote a patent airway and basic hygiene. This technique requires a clean suction catheter or suction handle/yankauer. Since the procedure is clean, not sterile, the catheter or suction handle may be used more than once

2. Airway Clearance - in conditions when the upper airway is bypassed or rendered inefficient, the utilization of oral/tracheal suctioning is a necessary therapy to clear secretions from the throat and trachea. This therapy may promote a cough reflex and allows a path for air to pass through.

3. Means to Control Infection - The inability to naturally clear oral/tracheal secretions opens the opportunity for bacteria to thrive. This may develop into common respiratory disorders, such as pneumonia. Suction therapy is indicated for the treatment and prevention of respiratory infections.

Suction Therapy Terminology

- **Aspiration** - the removal of secretions through the use of suctioning
- **Catheter** - a silicone tube passed along a mucous canal to permit the passage of fluid
- **Vacuum** - a space largely exhausted of air, which creates suction
- **Yankauer** - the hard plastic bent tube used for oral suctioning, also known as a suction handle

Suctioning a Patient in the Home

When possible, self-suctioning should be taught

HCS 4.0 INDICATIONS

The primary indication for suctioning the patient cared for at home is the patient's inability to adequately clear the airway by cough. The need for airway clearance is evidenced by:

- 4.1 more frequent or congested-sounding cough;
- 4.2 coarse rhonchi and expiratory wheezing audible to the patient and/or caregiver with or without auscultation;
- 4.3 visible secretions;
- 4.4 increased peak pressures during volume-cycled mechanical ventilation;
- 4.5 decreased tidal volumes during pressure-cycled ventilation;
- 4.6 indication by the patient that suctioning is necessary;
- 4.7 suspected aspiration of gastric or upper airway secretions;
- 4.8 otherwise unexplained increase in shortness of breath, respiratory rate or heart rate;
- 4.9 decreases in vital capacity and/or oxygen saturation (as indicated by pulse oximetry), thought to be related to mucus plugging.(22)

Polling Question 6

Suction Vacuum for ADULT patients in the home should be set at:
A. 80 – 100 mmHg  
B. 100 – 120 mmHg  
C. 100 – 150 mmHg  
D. 120 – 170 mmHg

Suction Vacuum Guidelines

The vacuum should be set:
• ADULTS between 100-150 mm Hg
• CHILDREN between 100-120 mm Hg
• INFANTS between 80-100 mm Hg
• NEONATES between 60-80 mm Hg

Suctioning the Tracheobronchial Tree

While suctioning, it is important to gently rotate the catheter to avoid damaging the respiratory mucosa. Suctioning should not be prolonged beyond 15 seconds, and may cause hypoxia due to oxygen being removed during the procedure. Normal saline should not be used routinely during suctioning, only when medically indicated.
Oral Suctioning

Oral suctioning is performed to clear the upper airways or to stimulate a cough reflex. This technique requires a clean suction catheter or suction handle/yankauer. Since the procedure is clean, not sterile, the catheter or suction handle may be used more than once.

Polling Question 7

Patients with tracheostomies are most often
A. Suctioned orally
B. Suctioned nasally
C. Suctioned tracheal
D. Suctioned oral-tracheal

Nasotracheal and Orotracheal Suctioning

- Catheter through nose into lungs.
- Suction applied while pulling catheter OUT.
- Orotracheal suctioning goes through the mouth rather than the nose.

Tracheal Suctioning

Tracheal suctioning is more often performed on a patient that has a tracheotomy then oral-tracheal suctioning. A tracheal suction procedure is performed with a sterile suction kit that is disposed after a single use. The kit would contain a water basin, suction catheter, one sterile glove, and possibly sterile saline. The suction catheter comes in many sizes, but the most common adult size is 14 french.

Polling Question 8

People with artificial airways cannot cough and therefore always require suctioning.
A. True
B. False

Coughing

Coughing is a natural reflex to protect the lungs by clearing mucus and bacteria. Patients with artificial airways can still cough.

• 2.1.1 Whenever possible, the patient should be encouraged to clear the airway by directed cough or other airway clearance techniques. (1-5)
• 2.1.2 Whenever possible, the patient should be taught to perform this procedure for himself.

http://aarc.org/desainjournals/rcjournal/rcjournal/x.RCJOURNAL.COM%20002.21.07/online_resources/oppa/asthmapg.html

Question 9

To supplement a tracheostomy patient’s humidification in the home, a/an ______ may be used
A. HME – heat moisture exchanger
B. Air compressor with aerosol and trach collar with heated moisture
C. Air compressor with aerosol and trach collar with cool moisture
D. All of the above

Humidification

• Tracheostomy bypasses the nose, so patients lose natural moisture and filtering mechanism
• Need to keep secretions thin and avoid mucous plugging
• Equipment used to apply humidification:
  - A heat-moisture exchanger (HME)
  - An air compressor with aerosol and trach collar (heated or unheated)

http://www.hopkinmedicine.org/tracheostomy/living/humidification.html
Complications of Long-Term Tracheostomy

- Accidental tube dislodgement
- Obstruction
- Infection
- Tracheal stenosis
- Subglottic stenosis
- Tracheo-esophageal fistula
- Tracheomalacia (thinning or erosion of the trachea)
- Narrowing of the trachea

http://www.hopkinsmedicine.org/tracheostomy/about/complications.html
http://www.mayoclinic.com/health/tracheostomy

Question 10

Tracheostomy considerations in pediatric patients are the same as in adult patients?
A. True
B. False

Consider Anatomy Differences in Children

- Softer, larger palate
- Larynx is higher
- Close approximation of larynx and tongue
- Less cartilage (softer)

http://www.caslpa.ca/PDF/conference/Handouts/CI_S5_Henry_Pediatric_Application_of_the_Passy-Muir_Swallowing_and_Speaking_Valves.pdf
http://www.cincinnatichildrens.org/assets/0/78/1067/1135/1957/1959/1389d6a8c46d7856-44c3-8497-3a71564960d2.pdf

Children and Tracheostomy

- Majority receive trach under 1 year of age
- Average age 2-3 years old
- Critical time for development
- Fine and gross motor movement limited
- Unable to practice and hear their own vocalizations
- Children often have other significant problems

http://www.caslpa.ca/PDF/conference/Handouts/CI_S5_Henry_Pediatric_Application_of_the_Passy-Muir_Swallowing_and_Speaking_Valves.pdf
http://www.cincinnatichildrens.org/assets/0/78/1067/1135/1957/1959/1389d6a8c46d7856-44c3-8497-3a71564960d2.pdf
Tracheostomy Care & Children

- Diameter of suction catheter should not exceed ½ the inner diameter of the artificial airway or a 0.5-0.66 ratio, although some recommend using largest catheter that will easily pass as a smaller catheter may not be efficient.
- Pre-oxygenation suggested prior to suction.
- Humidification of 50% minimum suggested.
- Routine use of normal saline is not recommended.

Faces you may recognize

Take away

- Patient and caregiver education needs to be provided – essential prior to and after.
- Communication assessment – prior to and after.
- Supplies readily available – AT BEDSIDE.
- Have a written emergency plan in place.

Thank you!
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