**Humidifier Circuit Tubing**

- Change the humidifier every eight hours, or as medically indicated.
- Never exceed a temperature that exceeds 37°C.

**Tracheostomy Tube Care**

- **Cuff Pressure**
  - Check cuff pressure using a hand pressure gauge every shift or a minimum of eight-hourly. Maintain the cuff pressure between 15-25 cm H2O, unless medically indicated.

- **Cuff Inflation**
  - Inflate cuff of tracheostomy tube only if medically indicated (e.g. on positive ventilation or high risk for aspiration).

**Inner Cannula Care**

- Impact the inner cannula at least hourly to ensure patency.
- Clean the inner cannula using sterile water or as according to manufacturer’s instruction prior to reinsertion.

**Stoma Infection**

- Observe for any signs of increased respiratory distress such as noisy breathing, excessive gurgling sounds and hypoxia during the weaning procedure.

**Swallowing Assessment**

- Refer tracheostomised patient with swallow/difficulty to speech therapist for assessment before commencing oral feeding.

**Tracheostomy Emergency**

- **Tube Dislodgement**
  - Tube dislodgement is displacement of tracheostomy tube by unintentional and complete tube coming out of the stoma or out of the trachea into the soft tissue of the neck.
  - Establish presence of spontaneous breathing when tube dislodgement is confirmed.
  - If breathing is present, ensure cuffed tube is deflated and provide patient with supplemental oxygen via facemask.
  - Emergency suction may be indicated if reinserter a new tracheostomy tube fails.
  - Prepare for change of tracheostomy tube or oral intubation.

- **Swallowing Assessment**
  - Ventilate the patient (and secure airway patency).
  - Remove inner cannula.
  - Ask the patient to cough.
  - Deflate the cuff tube (if this is in situ), bag and mask patient.
  - Call for medical help.
  - If breathing is present, ensure cuffed tube is deflated and provide patient with supplemental oxygen via facemask.
  - Emergency oral intubation may be indicated if reinsertion of a new tracheostomy tube fails.

**Tube Obstruction**

- Acute dysphoria is commonly caused by partial blockage or complete blockage of the tracheostomy tube by a mucous plug.
- Emergence suction may be indicated if reinserter a new tracheostomy tube fails.
- Prepare for change of tracheostomy tube or oral intubation.

**Evidence and Grade of Recommendation**

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<tr>
<th>Grade</th>
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<tr>
<td>1 ++</td>
<td>At least one meta-analysis, systematic review, or RCT rated as ++ (RR03), 1-36. [CDC, 2004]</td>
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<td>Evidence level 3 or 4; or</td>
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<td>Extrapolated evidence from studies rated as 1 ++ (RR03), 1-36. [CDC, 2004]</td>
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**Key References**


**Acknowledgements**

Singapore Ministry of Health Nursing Clinical Practice Guidelines Workgroup on Nursing Management of Adult Patients with Tracheostomy.
Summary of Recommendations

A. ASSESSMENT
Clinical Assessment of Airway
Assess all patients with tracheostomy for airway patency which include the absence of the following:
• abnormal breath sounds such as ‘whistling’, crepitus or diminished sounds
• irregular breathing patterns
• increase in coughing / inability to cough
• cyanosis / deterioration in oxygen saturation

B. SUCTIONING
Frequency of Suctioning
Perform tracheostomy suctioning at predetermined time points to be avoided.

Asepsis
Apply aseptic technique when performing tracheostomy suctioning.

Suction Catheters
Choice of Catheter
Use multiple-eyed catheters.

Use closed system suction catheter for patients on ventilators.

Size of Catheters
Determine catheter size using the following formula:
• Divide the tracheostomy tube inner diameter by two (2) which gives the external diameter of the suction catheter. Multiply this result by three (3) to obtain the French gauge (FG).

\[
\text{Tracheostomy size (inner diameter)} \times 2 \times 3 = \text{FG of suction catheter}
\]

Suctioning Pressure
Regulate the suction pressure for adults between 100 mmHg and 120 mmHg.

Suctioning Duration
Perform suctioning for not more than 15 seconds.

Preoxygenation
Preoxygenate patient prior to performing suctioning if necessary.

C. HUMIDIFICATION
Devices
Humidify the inspired gas using one of the following devices:
• Humidifier system – heated or non-heated
• Heat Moisture Exchanger (HME) Filter

Methods of Humidification
Use the following criteria to determine the methods of humidification:
• Heated Humidifiers – recommended for patients with:
  - New tracheostomy tubes
  - Dehydration
  - Immobility
  - Tenacious secretions
  - Prolonged mechanical ventilation (>7 days)
  - Hypothermia
• Heat Moisture Exchanger (HME) – recommended for patients with:
  - Adequate hydration
  - Mobility
  - Less copious secretions
  - Anticipation for discharge
• Contraindications for HME – Not suitable for patients with:
  - Thick, copious or bloody secretions.
  - An expired tidal volume less than 75% of delivered tidal volume and patients with COPD condition.
  - Weak respiratory muscles, who will be difficult to wean off the ventilator.

Heat Moisture Exchanger
Change HME daily, and whenever visibly soiled or according to manufacturer's recommendation.

Heated Humidification
Check, empty and discard condensate along the tubing of the heated humidification system. Do not drain condensate into the humidifier reservoir.

Humidifier Water
Use only sterile water to fill reservoir of humidifier or use single reservoir unit with closed water feed system.

Normal Saline Installation
Do not instill Normal Saline routinely to liquefy secretion.

Algorithm for Management of Emergency – Tube Dislodgment

Algorithm for Management of Emergency – Tube Obstruction

Normal Saline Installation
D/4
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