# INTUBATED PATIENTS

## Key points - How to handle intubated patients?

- When you need one nurse AND one RT
  - To be present at all times in the following scenarios

- Any X-Ray (to ensure ET tube positioned correctly)
- Transferring patient for Kangaroo care
- Changing incubators (presence of a third person is strongly encouraged

- When you need one nurse and one RT OR two nurses
  - To be present at all times in the following scenarios

- Changing of patient's position (back to prone, prone to back, major changes)
- Changing sheets
- Weighing patient
- Giving bath to patient

- When you need one nurse OR one RT
  - To be present at all times in the following scenarios

- Medical imaging tests (i.e. echocardiogram, head/abdominal ultrasound, electrocardiogram)
- Eye exam (presence of a Nurse is required in addition to having an RNA present)
- Suctioning a patient

*__RNAs__ are **not permitted** to provide care for intubated patients.
**__RTs__ should be informed when an intubated patient is undergoing an **invasive procedure** and will use their professional judgment in deciding whether their presence is needed at the bedside or simply nearby. **If there is a risk of ETT displacement, the RT should be present**

## What to look for – Ventilator Associated Pneumonia (VAP)

- Definition

- Ventilator-associated pneumonia (VAP) is defined as a **hospital-acquired pneumonia** occurring in patients requiring a device to assist respiration through a tracheostomy or endotracheal tube. The device must have been in place for at least 48-hours before the onset of the infection.
- VAP is associated with increased morbidity, prolonged mechanical ventilation, and overall increased length of stay in the ICU and hospital. The highest age-specific rates of VAP occur in infants between 2 to 12 months of age and the most common causative organism is Pseudomonas aeruginosa

- Preventive measures

  - Elevation of the head of the bed (HOB)/torso

- Unless contraindicated and accompanied by a written medical order, the **head of the bed is kept elevated at all times**, regardless of feeding status, in order to prevent aspiration of oropharyngeal, nasopharyngeal secretions or gastrointestinal contents. Elevating the head of the bed **does not replace the need for regular turning and repositioning** Q2H to prevent development of pressure ulcers.

- Recommended angle of elevation
  - *Premature: 10º - 15º*
  - *Neonates: 15° - 30°*
  - *Pediatric: 30° - 45°*
- **Caution** when elevating the head of the bed (i.e., position according to the patient's tolerance)
  - *Cardiovascular instability*
  - *Unstable pelvic fractures*
  - *C-spine precautions*
  - *Traction*
  - *Patients on High Frequency Oscillatory Ventilation (HFOV) with Sensor Medic*
  - *Neonates with external ventricular drainage (EVD)*
- **Contra-indications**: Neonates with abdominal wall defects (e.g. gastroschisis) and a Silo in place

### ♦ Routine oral care

- To remove secretions that pool at the back of the throat, and decrease bacterial/fungal colonization of mouth, routine oral care must be done with each check. See below for procedure.

### ♦ Proper positioning of oral and nasal gastric tubes

- Unless contraindicated and accompanied by a medical order, an **oral or nasal gastric tube should be placed** for intubated patients
- To prevent gastric over-distension and reduce the risk of aspiration, the **stomach must be checked for air and decompressed** prior to each feed

### ♦ Elimination of routine use of saline instillation for suctioning

- There is evidence that use of NS for ETT suctioning flushes the biofilm that coats the inside of the ETT into the lungs and the lower respiratory tract contributing to VAP. NS instillations may also cause oxygen desaturation
- The nurse, RT or physiotherapist will:
  - *Avoid using saline flushes for routine ETT suctioning, unless ordered by physician, or the ETT appears plugged (saline flush is an irritant that provokes cough; it does not liquefy secretions).*
  - *Consider other methods (e.g. chest physiotherapy, medication such as sodium bicarbonate, DNase, 3% sodium chloride by aerosol) to promote cough and removal of thick secretions by discussing with the medical team*

### ♦ Use of in-line suction (closed system)

- The ETT suction set-up should remain closed as much as possible. Therefore, in-line suctioning system is instituted for most intubated and ventilated patients. See below for procedure for inline suctioning. Open suctioning has not been proven to be better, and keeping the circuit closed prevents infection.
- The **RT** will:
  - *Change the in-line suction catheters only when visibly soiled or Q 7 days*

### ♦ Care of suction equipment

- Suction equipment used for oropharynx and artificial airways becomes colonized with pathogens within 2-24 hours.
- The **nurse, RT, or physiotherapist** will:
  - *Use separate suction set-up for ETT & oral suction systems - Label each set-up.*
  - *Change suction tubing used for ETT & oral suction Q24H*
  - *Rinse the oral suction device and in line suction catheter with sterile water or normal saline after each use.*
  - *Ensure little sucker has cap in place whenever it is not in use*
  - *Change the little sucker Q 24H or sooner if visibly soiled to prevent growth of bacteria*
- The **PCA** will:
  - *Change suction canister lining when ¾ full*

- Ventilator / Equipment care (done by the RT)

- All measures should be taken to open the ventilator circuit as infrequently as possible

- Assessment of readiness to extubate

- In attempt to reduce the exposure to endotracheal intubation the use of non-invasive ventilation and early extubation should be considered and discussed on a daily basis. The goal is to limit the number of intubations / reintubations and the duration of intubation and mechanical ventilation. The risk of VAP increases with duration of intubation

## Procedure – Oral Care?

### Why?

- The mouth is a major source of microorganisms. Incorporating routine oral hygiene into standard practice reduces VAP
- To help prevent aspiration of contaminated secretions pooled in the back of the oral cavity, the **oropharynx must be suctioned before**:
  - *Performing oral care*
  - *Suctioning the ETT*
  - *Repositioning the ETT*
  - *Deflating cuff (if present)**
  - *Repositioning the patient in bed*
  - *Extubation*
  - *Suctioning the nose to reduce risk of cross contamination*
- **General principles** related to interventions:
  - *Patients with artificial airways are provided developmentally appropriate mouth care each time the patient receives regular nursing care ("check"). If the patient is < 32 weeks, the minimal handling policy should take precedence – these babies do not always require a long suction catheter, and the Little Sucker may be used instead.*
  - *Be attentive to infant's cues – if infant becomes distressed, contain and comfort until stability is re-established. Follow infants tongue movements with the 2"X2" gauze pad.*

### Who?

- The oral cavity should be assessed initially and daily by the nurse and the RT
- Oral care can be provided by both RN and RT

### Material

- 2" X 2" gauze pads
- Suction catheter (appropriate size)
- "Llittle Sucker"
- Clean gloves
- Sterile water to rinse suction tubing

### How?

1. Gather supplies
2. Disconnect little sucker from tubing. Ensure little sucker has cap in place. (If baby is < 32 weeks, little sucker may be used for oral care instead of long suction catheter).
3. Ensure suction is at appropriate strength (110 mmHg)
4. Perform hand hygiene as per MUHC Infection Control Policy
5. Ensure head of bed is elevated
6. Put gloves on
7. Using clean technique, attach suction catheter to suction tubing (keeping distal portion of tubing covered)

8. For patients with teeth:
   - *Follow manufacturer's instructions for oral care products (brush teeth gently twice a day with appropriate sized toothbrush)*
9. Using suction catheter, suction secretions from mouth and oropharynx that have pooled at the back of the oral cavity; this is to prevent them from migrating down the ETT
10. Rinse suction tubing with sterile water and reconnect to little sucker
11. Next, using 2" X 2" gauze pads moistened with sterile water, gently brush the surface of the tongue and wipe secretions from lips
12. Apply lip balm to keep lips moist, as needed. Careful attention should be paid to avoid placing lip balm near ETT tapes as this may help loosen them.
13. Discard used supplies
14. Remove gloves and perform hand hygiene

## Procedure – Inline Suctioning

### Why?

- To facilitate removal of secretions from the ETT tube, and maintain a patent airway.
- To prevent infection.

### Who?

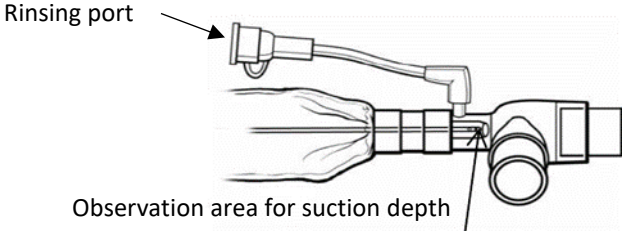
- Both nurses and RTs can perform inline suctioning.
- The following conditions require the presence of an RT when performing inline suctioning:
  - *iNO (inhaled nitric oxide)*
  - *High frequency ventilation (both Sensor Medic and Drager ventilators)*
  - *JET ventilation*

### Material

- Sterile pink NS squirt (x1)

### How?

1. Gather supplies
2. Ensure ETT suction is at appropriate strength (110 mmHg)
3. Perform hand hygiene as per MUHC Infection Control Policy
4. **Assess respiratory status** (breath sounds, chest movement and oxygenation) prior to suctioning.
5. Unlock suction control valve (round white oval) by lifting and rotating the valve 180 degrees.
6. **Note appropriate suction catheter insertion depth** as posted on ventilator ("Do not suction beyond _____ cm"). The appropriate centimeter mark should be visible in the observation area of inline suction device when suctioning (see picture).
7. If insertion length not posted on ventilator, centimeter markings on the ETT can be matched with the centimeter markings on the suction catheter. The RT should be advised that the insertion depth sign is missing from the bedside.



8. **Increase FiO2** if patient known to desaturate with suctioning. Some patients will not require pre-oxygenation, while others will.
9. Connect a pink sterile NS squirt to the grey rinsing port.
10. **Support the ETT** with your non-dominant hand. **Gently push the suction catheter forward** to the "Y" junction where the ventilator circuit and the inline suction system meet. Advance the catheter through the plastic by pinching it with the thumb and forefinger of your dominant hand and by gently pushing the catheter forward bit by bit until the predetermined number/colour is visible in the observation area.
11. While continuing to support the ETT and adaptor with your non-dominant hand, **apply suction by depressing the control valve** and waiting one second before **withdrawing the catheter** to its fully extended length. (Pausing briefly before withdrawing permits suctioning of secretions beyond the ETT).
12. **Observe** the secretions (amount, colour, consistency).
13. **Repeat** suctioning as required. Allow sufficient rest time between passes, depending on the infant's condition.
14. **Flush** the catheter using the pink NS squirt:
    - *Ensure that the black catheter tip is in the inner cavity before flushing*
    - *First depress the suction with your dominant hand, and then slowly instill the amount of saline required to completely flush the catheter*
    - *It is important to first depress the suction control valve before instilling the saline so that the saline is flushed towards the catheter and not towards the baby.*
15. Remove the pink NS squirt and close the grey rinsing port firmly so that no leaks occur in the system.
16. **Lock** the suction control valve by lifting and turning the white oval piece 180 degrees.
17. **Reassess respiratory status** post suction (breath sounds, chest movement and oxygenation). Reassess FiO2, especially if changes were made for the procedure.
18. Perform hand hygiene.
19. **Document** the amount, color and consistency of secretions on the Nursing Flowsheet

## Procedure – Specimen procurement (ETT aspirate) for culture

### Why?

- To obtain specimen from the endotracheal tube (ETT) for culture in microbiology.
- Note: Virology specimens generally must be taken from the nasopharynx (suction via nose), and cannot be taken from the ETT.

### Who?

- Technique requires at least **two nurses, or one nurse and one RT**, in order to maintain sterility.

### Material

- Appropriately sized sterile suction kit (includes catheter, box/cup for water, and sterile gloves) - for ETT sizes 2.5-3.5, a 6 Fr catheter should be used
- Mucous trap
- Sterile water bottle (500 mL bottle with blue cap, for microbiology specimens)

### How?

1. Both people should perform **hand hygiene** as per protocol
2. Ensure ETT **suction set at 110 mm Hg** & is functioning
3. Disconnect wall suction tubing from inline suction, and **attach to mucous trap without contaminating mucous trap** (mucous trap can be held by second person while in open packaging, exposing only white connector)
4. Person performing suction:
    - *Open sterile suction kit so that gloves lie on top (and are accessible)*

- *Put sterile gloves on*
- *Open small water box/cup and have helper fill with sterile water*
- *Take catheter in both hands, and remove from plastic covering*
- *Remaining sterile, wrap catheter around dominant hand (hand that will be used for suctioning)*
- *With non-dominant hand, attach sterile suction catheter to soft tubing of mucous trap*

5. Helper:
   - *Disconnect ventilator from endotracheal tube (patient may need pre-oxygenation if is known to not tolerate disconnection/suction well)*
6. Person performing suction:
   - *Insert suction catheter to base of ETT (match markings on suction catheter to markings on ETT to ensure suctioning to adequate depth)*
   - *Suction secretions while withdrawing suction catheter ; if no secretions obtained in catheter, may pass again if patient tolerating procedure. If patient not tolerating procedure, reconnect ventilator/provide PPV and adjust O2 as needed. Retry once patient stabilized.*
   - *After suctioning, rinse your suction catheter in sterile water (for bacterial culture). This will draw secretions into the mucous trap.*
7. Helper:
   - *Reconnect ventilator*
8. Person performing suction:
   - *Disconnect wall suction from mucous trap*
   - *Disconnect suction catheter from mucous trap*
   - *Fold over soft tubing of mucous trap and attach it to the white connector to form a closed circuit (so nothing will leak)*
   - *Label mucous trap and send to appropriate lab for processing*
9. Wash hands after removing gloves