Providence HEALTH CARE	Department: **Respiratory Services**	Date Originated: October 2007 Date Reviewed/Revised: **October 2010**
POLICY & PROCEDURE	Topic: Critical Care – Endotracheal Intubation by Respiratory Therapists Number: B-00-12-12064	Related Links:

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APPLICABLE SITES:

St. Paul's Hospital
Mount Saint Joseph Hospital

POLICY STATEMENT:

A Registered Respiratory Therapist who has successfully completed the PHC Endotracheal Intubation Training Program for Respiratory Therapists may perform endotracheal intubation under the direction of an ICU Attending Physician.

The Registered Respiratory Therapist will maintain annual certification and complete the Continuing Competency requirements as per the guidelines of the Endotracheal Intubation Training Program.

For **initial certification** the Registered Respiratory Therapist must complete five (5) successful intubations that are directly supervised by an ICU Attending Physician, Anaesthetist, or ICU Fellow.

To **maintain** certification and competence a minimum of five (5) successful intubations must be completed annually including two (2) that are directly supervised by an ICU Attending Physician, Anaesthetist, or ICU Fellow.

Endotracheal Intubation may be performed by an Intubation Certified Respiratory Therapist under the following guidelines:

a) Mount Saint Joseph Hospital:

i) External Transports.
ii) Cardio-Respiratory Arrest (Code Blue).
iii) Emergent/Elective situations as directed and supervised by an ICU Attending Physician.

b) St. Paul's Hospital:

i) External Transports.

ii) Cardio-Respiratory Arrest (Code Blue) as directed and supervised by an ICU Attending Physician.

iii) Cardio-Respiratory Arrest (Code Blue) if the ICU Resident is unsuccessful in obtaining a patent artificial airway after two (2) attempts.

iv) Emergent/Elective situations as directed and supervised by an ICU Attending Physician.

NOTE: St. Paul's Hospital is a teaching facility and as such the Respiratory Therapist will assist Residents, students and colleagues with learning and instructional opportunities prior to, during, and post endotracheal intubation without compromising patient safety.

Endotracheal Intubation will not be attempted in the following circumstances:

a) Spontaneous respirations are present.

- If spontaneous respirations are present 100% oxygen and/or supplemental ventilations via a manual resuscitator will be provided.

b) Proven and/or suspected difficult airway (Grade IV).

- For all difficult airways an ICU Attending Physician and/or Anaesthetist will assume primary responsibility for securing the artificial airway.

In the event that endotracheal intubation by a certified Respiratory Therapist is unsuccessful after one (1) attempt an ICU Attending Physician and/or Anaesthetist will be responsible for subsequent intubation attempts.

INTUBATION TRAINING PROGRAM FOR RESPIRATORY THERAPISTS:

Competency Components:

Successful completion of the Endotracheal Intubation Training Program is achieved by:

1. Obtaining a satisfactory passing grade of 85% on the written examination.

2. Demonstration of satisfactory knowledge of the intubation procedure through supervised practical experience using the intubation mannequin, including verbal rationale of the procedure.

3. Completion of the required number of successful supervised intubations as documented in this policy above.

Certification of Endotracheal Intubation is maintained annually by:

1. Ongoing procedure competence as determined by successfully completing the required number of intubations (both supervised and unsupervised) on an annual basis as documented in this policy above.

2. Successful completion of an oral examination.

REQUIRED EQUIPMENT:

- Functional manual resuscitator with mask attached to an oxygen source
- Oropharyngeal airways
    - Sizes 8, 9, 10
- Nasopharyngeal airway
    - size 32 Fr
- Functional suction setup with mouth yankeur attached
- Appropriate size tracheal suction catheters
- Appropriate size endotracheal tubes
- 12 mL syringe
- Stylet
- Scissors
- Magill forceps
- Kelly clamps – rubber tip
- Lidocaine spray with nozzle – Check Expiration Date
- Laryngoscope handle with blades – 3,4
- Water soluble lubricant
- Bite block
- Ties or Tapes
- EasyCap CO_2 detecting device – Check Expiration Date
    - Calibrated capnography may also be used to confirm endotracheal intubation
- Peep valve – adjustable
- Flex tube
- Spare bulbs/batteries for laryngoscope
- Stethoscope
- Oximeter/Cardiac monitor
- Personal protective equipment – eyewear, gloves, N95 Mask, gown

PREPARATION:

1. Select appropriate size endotracheal tube and open the package to access the one-way valve. Attach the syringe and pressurize cuff to assess for leaks. Deflate cuff fully and remove syringe.

    - MALES: size 8.0 – 8.5
    - FEMALES: size 7.5 – 8.0

2. Lubricate the distal end of the endotracheal tube by opening the cuff end of the package and applying a small amount of water-soluble lubricant to the cuff area. Take care not to spread lubricant onto the region of the tube that will be held during insertion.

3. A Stylet may be placed within the endotracheal tube to permit adjustment of the curvature to aid in insertion. The distal tip of the stylet must not extend beyond the endotracheal tube. Rubbing the stylet with an alcohol swab prior to placement into the endotracheal tube will allow it to be removed easier after intubation.

4. Assess the function of the laryngoscope batteries, blades, and bulbs. The light should be off until ready for use to preserve battery and bulb strength.

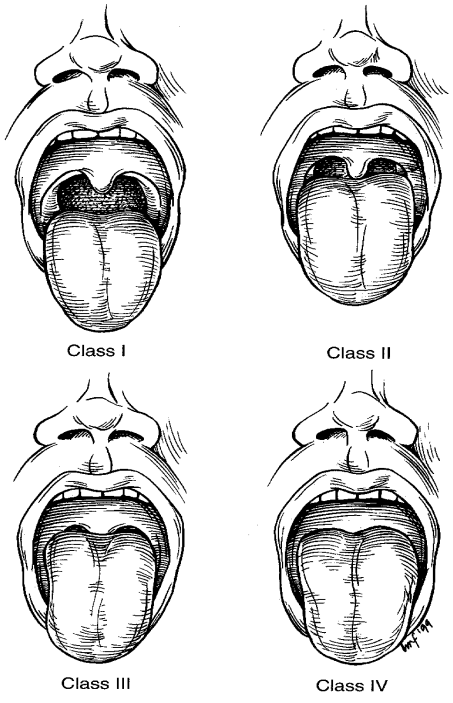
PATIENT ASSESSMENT:

The patient should be assessed for the following factors which may increase the difficulty of intubation:

a. **Neck and Cervical Spine** – injuries, limited range of motion, physical abnormalities or limitations

b. **Mallampati Criteria** – classification system based on tongue size relative to oral cavity size which may predict the degree of difficulty visualizing the glottis (Class I-IV). Refer to diagram below.

Class I: Faucial pillars, soft palate and uvula can be visualized.
Class II: Faucial pillars and soft palate can be visualized, but the base of the tongue masks the uvula.
Class III: Only the base of the uvula can be visualized.
Class IV: None of the three structures can be visualized.



c. **Limited Oral Access** – facial trauma, tumor, enlarged tongue, temporomandibular joint disorders, mandibular or maxillary abnormalities

d. **Teeth** – missing, damaged or protruding teeth, caps, dentures, bridges, retainers

e. **Cardio-Respiratory** – evaluation of vital signs prior to intubation

Mallampati Criteria is a classification system based on tongue size relative to the size of the oral cavity, which may predict the degree of difficulty visualizing the glottis (Class I-IV).

PROCEDURE for INTUBATION:

1. Assemble and test intubation equipment for proper function.

2. Perform complete patient assessment as time permits.

3. Wash hands and don personal protective equipment following PHC infection control guidelines.

4. Suction patient mouth and upper airway.

5. Place patient's head in the 'sniffing' position and adjust bed to comfortable height.

6. Remove loose dentures and very loose teeth. Dentures that are secure may be left in place.

7. Ventilate and oxygenate patient with manual resuscitator and mask using 100% oxygen. Place oropharyngeal airway if necessary.

   NOTE: Patient must be re-oxygenated at least every 30 seconds during intubation procedure.

8. Spray the upper airway with Lidocaine as needed to decrease reactivity during intubation.

   NOTE: Greater than 15 sprays of Lidocaine may have toxic adverse effects.

9. Perform Sellick maneuver – have an assistant apply firm backward pressure at the level of the patient's cricoid cartilage, compressing the esophagus and reducing the risk of aspiration.

   NOTE: Pressure is maintained until the endotracheal tube is confirmed to be in the correct position and cuff is inflated.

10. Grasp the laryngoscope in the left hand. Use the right hand to gently open patient jaws. Introduce the blade to right side of mouth between teeth, displacing tongue to the left and lifting the lower jaw slightly. Advance the blade inward and toward the midline until you can identify the uvula, base of the tongue, and the epiglottis.

11. Upon visualization of the epiglottis advance the blade tip into the vallecular space between the base of the tongue and the epiglottis.

12. Lift the laryngoscope handle upward and forward at a 45° angle, following the position of your thumb until the vocal cords and arytenoid cartilages are clearly seen.

    NOTE: Do NOT pull back towards you and do NOT use the blade and handle as a lever to pry open the mouth as this may break teeth and result in tissue damage.

13. Grasp the prepared endotracheal tube in your right hand and insert at the right side of the patient's mouth, below and to the right of the laryngoscope blade, taking care not to damage the cuff on the patient's teeth.

14. Pass the endotracheal tube along the right side of the pharynx and through the vocal cords just above the arytenoid cartilages. Take care not to use the blade as a tube guide or the tube will compromise direct visualization of the cords.

15. Advance the tube carefully in one smooth motion until the entire cuff has passed beyond the vocal cords and then advance a further 3cm. Avoid repeatedly trying to jab or poke the endotracheal tube through the glottis as glottic edema will develop.

    NOTE: If the endotracheal tube cannot be placed within 30 seconds it must be taken out and the patient manually ventilated and re-oxygenated before further attempts are made.

16. Remove the laryngoscope and then the stylet while holding the endotracheal tube steady with your right hand.

17. Inflate the cuff and ventilate the patient using the manual resuscitator with the EasyCap CO_2 Detector *or* capnography airway sensor in place and confirm positive CO_2 readings. Refer to the Colour Range chart at the end of this document.

18. Once proper placement of the endotracheal tube has been confirmed, stabilize its position by securing the tube with the ties/tapes. Place a bite block if necessary.

19. Monitor patient vital signs to ensure stability. Obtain CXR and ABG.

POST-INTUBATION CARE:

1. Ensure the endotracheal tube cuff is inflated to minimal occlusion volume until access to a cuff pressure measuring device is available.

2. Attach the endotracheal tube to an appropriate supportive device (ventilator, T-piece) or continue with manual ventilations if the patient is unstable.

3. Following CXR check for correct position of the tube and reposition as necessary. Consider cutting the tube length if there is a large amount of excess tube exposed.

4. Review ABG results and make appropriate changes to ventilation and/or oxygenation.

5. Secure endotracheal tube correctly and record the placement by indicating the cm marking on the tube midline at the teeth/gums while noting the position of the tube within the opening of the mouth (left/right/midline).

6. Ensure the patient is not displaying any immediate complication of endotracheal intubation. Alert the ICU Physician to any serious complications.

7. Suction the patient via the endotracheal tube and obtain a sputum sample for Culture & Sensitivity. Complete a requisition and send to the laboratory.

8. Record all pertinent information in the appropriate location of the patient record and respiratory notes.

9. Clean equipment and restock intubation supplies ensuring it is sealed, dated, and initialed.

EASYCAP CAPNOGRAPHY COLOUR RANGE CHARTS

Patients with Adequate Perfusion/Spontaneous Heartbeat			
EasyCap or Capnography Result	**Auscultation**	**Indicates**	**Required Action**
Colour Range **A** $CO_2 < 4$ mmHg	Air entry heard over gastric region; breath sounds may or may not be referred	Endotracheal tube is not in the trachea	Remove tube and provide manual ventilations via bag-mask
Colour Range **B** CO_2 4-15 mmHg	Breath sounds may be audible bilaterally (if unilateral may be in the right mainstem); if audible over gastric region consider esophageal intubation	Retained CO_2 in the esophagus, Or Low perfusion, Or Hypocarbia	Deliver 6 more breaths and recheck – if colour remains tan (or CO_2 unchanged), tube is in the trachea; may confirm via direct laryngoscopy
Colour Range **C** $CO_2 > 15$ mmHg	Breath sounds audible bilaterally (if unilateral, tube may be in right mainstem bronchus)	Endotracheal tube is in the trachea	Secure ETT (reposition if right mainstem intubation suspected)

Patients with Poor Perfusion/Cardiac Arrest			
EasyCap or Capnography Result	**Auscultation**	**Indicates**	**Required Action**
Colour Range **A** CO_2 < 4 mmHg	Air entry heard over gastric region; breath sounds may or may not be referred	Endotracheal tube is not in the trachea ***Or*** Inadequate Perfusion (ineffective CPR)	Check position via direct laryngoscopy – if ETT is not in correct position or unable to confirm, remove and provide manual resuscitations
Colour Range **B** CO_2 4-15 mmHg	Breath sounds may be audible bilaterally (if unilateral may be in the right mainstem); if audible over gastric region consider esophageal intubation	Retained CO_2 in the esophagus, Or Low perfusion,	Deliver 6 more breaths and recheck – if colour remains tan (or CO_2 unchanged), tube is in the trachea; may confirm via direct laryngoscopy
Colour Range **C** CO_2 > 15 mmHg	Breath sounds audible bilaterally (if unilateral, tube may be in right mainstem bronchus)	Endotracheal tube is in the trachea	Secure ETT (reposition if right mainstem intubation suspected)