PRACTICE GUIDELINE

Effective Date: 9-17-04 Manual Reference: **Deaconess Trauma Services**

TITLE: ENDOTRACHEAL INTUBATION AND AIRWAY MANAGEMENT

PURPOSE: To define the indications for the need of airway control, assure equipment is readily available for adequate airway management in pediatric & adult patient's during resuscitation, provide a procedural guideline for the insertion of an endotracheal tube for the purpose of airway protection, and provide access for positive airway pressure ventilation.

GUIDELINES:

1. Indications:

- a. Impairment of level of consciousness (GCS< 8).
- b. Chest injury with lung contusion and/or flail chest.
- c. Respiratory failure.
- d. Aspiration.
- e. Drowning.
- f. Severe facial trauma.
- g. Prior to or immediately following neuromuscular blockade.
- h. Ruptured diaphragm.

| Need for airway protection | Need for ventilation |
|---|---|
| Unconscious | Apnea |
| Shock | Unconscious |
| Combative patient with life-threatening | Neuromuscular paralysis |
| injuries | |
| Severe maxillofacial fracture | Inadequate respiratory effort |
| Facial burns | Tachypnea |
| Inhalation injury | Hypercarbia |
| | Cyanosis |
| Risk of aspiration | Severe closed head injury with need for |
| Bleeding | hyperventilation |
| Vomiting | |
| Risk for obstruction | Failure to maintain adequate oxygenation by |
| Neck hematoma | face mask supplementation |
| Laryngeal, tracheal injury | |
| Stridor | |

2. Provides:

- a. A safe, sufficient airway.
- b. A mechanism for giving positive-pressure ventilation
- c. A route for efficient tracheobronchial toilet.
- d. A means of preventing aspiration.
- e. A route for fiberoptic brochoscopy.

3. Preparation and equipment:

a. Monitors, Airway (ET tube, stylet/syringe), IV, Drugs (RSI), suction, ambu-bag, & tape to secure the ETT.

- b. ET tube: 7.5 mm or greater tube is preferred for adults to facilitate bronchoscopy as needed. Pediatric cart is located in the Trauma room at all times. The cuff should be tested. The stylet may be inserted but should not extend beyond the hole in the end of the tube (Murphy's eye).
- c. A 10 cc syringe should be attached to the tube.
- d. Xylocaine jelly should be available upon request.
- e. Laryngoscope should be tested before use. Both Miller and Mac blades should be available.
- f. Oral &/or nasal oropharyngeal airways should be available.
- g. Ambu-bag with oxygen supply.
- h. A ventilator will be readily available for use by respiratory therapist in the Trauma Resuscitation room.
- i. IV access-at least one functional IV site.
- i. Induction drugs at bedside.
- k. Monitors-both EKG and pulse oximeter; ETCO2 monitoring preferred.
- 1. Assume C-spine injury exists and maintain C-spine immobilization.
- m. Cricothyroidotomy kits, 4 mm & 6 mm should be available for emergency situations.

4. Technique:

- a. The Emergency Room Physician, Trauma Surgeon, and/or Anesthesiologist will manage the airway of the trauma patient. Pre oxygenate patient prior to intubation.
- b. For use of muscle relaxants.
- c. The mouth and pharynx are brought nearest to a straight line by stabilizing the atlanto-occipital joint. In the trauma situation, one individual should provide in-line stabilization. The anterior portion of the collar may be removed if the neck is stabilized. Cricoid pressure (Sellick maneuver) should be applied by assistant.
- d. The laryngoscope is held in the left hand and inserted along the right side of the mouth, pushing the tongue to the left. Depth perception is difficult and, therefore, structures should be identified as the blade advances past the tongue and epiglottis.
- e. The tip of the blade is inserted behind the vallecula.
- f. Traction is then applied along the long axis of the handle and the patient is "suspended by his jaw." The blade should not be levered on the teeth as a fulcrum.
- g. Under continual vision, debris in the pharynx and trachea are suctioned.
- h. The endotracheal tube is inserted through the cords; it should be inserted just far enough to ensure that the cuff is past the cords. The cuff is inflated.
- i. Check the position of the tube into the trachea by lightly bagging patient and auscultate breaths sounds over lung fields.

- Use a CO2 detector to determine appropriate positioning in the trachea. The primary RN must document two sources of verification for ETT placement.
- j. Assess for right mainstem intubation by inspection, palpation, and auscultation. If endobronchial intubation is suspected, deflate cuff and withdrawl tube a few centimeters.
 Inflate cuff and reassess breath sounds.
- k. Tape tube securely in place.
- 1. Check tube position by X-ray.

5. Causes of difficult intubations:

- a. Short muscular neck with a full set of teeth.
- b. Receeding lower jaw with obtuse mandibular angle.
- c. Protruding upper incisor teeth associated with overgrowth of the premaxilla ("rabbit teeth").
- d. Poor mobility of the mandible.
- e. A long, high arched palate associated with a long, narrow mouth.
- f. Increased alveolar-mental distance that necessitates wide opening of the mandible for laryngoscopy.

6. Special problems in children (to puberty):

- a. Narrowest part is below the larynx at the level of the cricoid ring.
- b. The curled epiglottis of the young child makes the straight blade preferable.
- c. Micrognathia and hydrocephalus increase intubation difficulties.

7. Nasal Intubation:

- a. This method is a useful route for "blind' intubation and more comfortable in an alert patient. It requires considerable practice and a breathing patient.
- b. Disadvantages:
 - i. May carry a mass of adenoid tissue into the trachea.
 - ii. May precipitate profuse epistaxis.
 - iii. May provoke vomiting.
 - iv. Does not allow visualization of the oropharynx and trachea
 - v. A nasal tube should be at least one size smaller that a corresponding oral tube.
 - vi. May lead to maxillary sinusitis.
 - vii. More difficult than orotracheal intubation.
 - viii. Is contraindicated in the presence of maxillofacial fracture.

8. Extubation:

- a. Have a laryngoscope and a new tube available along with suction
- b. The oropharynx and trachea are suctioned thoroughly, and after oxygenation for a few minutes, the cuff is deflated and gentle suction is applied as the endotracheal tube is withdrawn.

9. Obtain chest x-ray to verify placement any time airway is placed, changed, repositioned related to depth, or revised.

REFERENCES:

- ❖ Deaconess Trauma Guideline Manual, EMERGENCY RESUSCITATIVE THORACOTOMY.
- ❖ Deaconess Trauma Guideline Manual, PATIENT IN EXTREMIS FLOWCHART.
- ❖ Deaconess Trauma Guideline Manual, CRICOTHYROTOMY.
- ❖ Deaconess Emergency Department Policy & Procedure Manual, RAPID SEQUENCE INDUCTION (RSI).

| REVIEWED DATE | REVISED DATE |
|---------------|--------------|
| JAN 05 | JAN 08 |
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