Neonatal Intubation

Purpose

To assure proper placement of endotracheal tubes for maximum ventilation using proper intubation procedures.

Scope

The policy applies to all Respiratory Care Services personnel functioning as Respiratory Care Practitioners with neonatal experience trained as outlined in Respiratory Care Services authorization for Intubation of Neonatal Patients, Policy #7.1.13.

Indications

Ventilation – Apgar score 0-3, ventilatory failure (or resuscitation), bag and mask unsuccessful or undesirable (diaphragmatic hernia, meconium aspiration), CPAP
Obstruction - upper airway, Pierre Robin
Protection - from aspiration
Secretions - pulmonary toilet
Emergency Elective - Orotracheal is preferred, nasotracheal may be used. There is little agreement as to preference of nasotracheal intubation in neonates.

Equipment

- Cardiorespiratory monitor SaO_2 monitor.
- Laryngoscope with extra batteries and bulb
- Blade
- ET tubes
- Stylet - Bag and mask with manometer and adjustable O_2 source.
- $ETCO_2$ detector
- Suction apparatus plus catheters
- Sterile water or lubricant
- Fixation device (Neobar), scissors, tape, etc.
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Anatomic Considerations for Infant Intubation

- Larynx more anterior and cephalad
- Tongue relatively large
- Short neck
- Epiglottis is longer, stiffer and protrudes at 45° angle
- Trachea is short (easy for bronchial intubation)
- Elevation of hyoid bone may precipitate apnea
- Nasal lymph tissue may prevent nasal intubation
- Cricoid ring is narrowest point of airway

Cautions

Do not overextend neck in infants. Always visualize ET tube going into the glottis (black vertical triangular slit with white cords), the esophagus is a muscular horizontal slit. Never attempt procedure for more than 30 seconds at a time, and always use a manometer when bagging infants.

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Complications

Insertion
- Hypoxia (maximum 15 seconds)
- Trauma (poor technique), hemorrhage, broken teeth, spinal cord damage
- Aspiration (gag reflex), vomitus, blood, arrhythmias/ hypotension vagal stimulation, apnea, bronchospasm/laryngospasm

Improper Position
- In esophagus
- In pharynx
- In right mainstream
- Beveling at carina

Obstruction
- Secretions
- Kinking

Improper Care
- Contamination
- Oral/nasal necrosis
- Palatal groove

Body Response
- Edema, BPD
- Granulomas
- Cord paralysis
- Atelectasis
- Barotrauma
- Tracheal & pharyngeal perforation
- Elimination of physiological PEEP

Procedure Continued

Orotracheal Procedure:

Step	Action
1	Assemble and prepare equipment: • Insure scope light, suction and bag & mask works. • Select appropriate tube size. • Cardiorespiratory monitoring is a must. • Heat source for infant.

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Procedure Continued

Orotracheal Procedure:

Step	Action
2	Prepare and Identify Patient: • Infant- Sniff position (rolled towel under shoulders), supine - do not hyperextend • Suction oropharynx and nasopharynx as needed • Ventilate and oxygenate- For 1 minute if possible • Hyperventilate with enriched O_2 (100% is most commonly used) • Pressure: 20-30 cm H_2O (or matching current ventilating pressure) • **Do not bag** if: meconium aspiration, diaphragmatic hernia, upper airway obstruction • Monitor vital signs and SaO_2
3	Intubate - Position self at patient's head, hold scope in left hand, open mouth with fingers (not blade), insert blade into right side of mouth, move blade to center of mouth pushing tongue to the left side, slowly advance blade and lift epiglottis till larynx is visualized. If esophagus is seen first, withdraw blade slightly. Position curved blade under top of epiglottis and lift.
4	Visualization may be improved by: • Suctioning of pharynx • Gentle "lifting" of the scope • Gentle pressure on the hyoid bone
5	Insert ET tube into right side of mouth using right hand and pass alongside of blade (not through the groove). • Advance tube 1-2 cm through cords while maintaining visualization. • A stylet may be used but ensure it is at least 1 cm back from tip.
5	• Hold tube in place (note position) and gently withdraw laryngoscope • Attach bag with $ETCO_2$ detector and ventilate and oxygenate

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Procedure continued

Orotracheal Procedure Continued:

Step	Action
6	Confirm position by: • $ETCO_2$ detector • Auscultation of chest and stomach • Chest excursion • Improved color • Improved heart rate • Improved SaO_2 • Stat x-ray • All the above should occur within seconds
7	Correct position is: • 1 cm above carina, midway between carina and clavicle in small infants • Listen at L mid-axillary, advance tube until BS ↓ (in mainstem bronchus), then pull back the appropriate distance.
8	Secure tube: refer to policy 7.3.39. • Ensure that tube is secured with the appropriate sized Neobar • Cut tube ~0.5 cm beyond where it is taped to the Neobar phalange (after confirming tube placement on x-ray)

Documen-tation

Documentation in Epic includes the following: the addition of tube as an LDA in the 'Doc Flowsheet' portion of EPIC and a note entered into the Progress Notes portion of EPIC describing the intubation procedure.

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Infection Control

Follow procedures outlined in Healthcare Epidemiology Policies and Procedures #2.24; Respiratory Care Services.
http://www.utmb.edu/policy/hcepidem/search/02-24.pdf

References

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