

**NCCU CLINICAL GUIDELINES**  
**SECTION: 2**

**RESPIRATORY PROBLEMS AND MANAGEMENT**

Section 2: Respiratory problems and management  
Intubation  
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**INTUBATION**

Placement of an oral or nasal endotracheal tube for:

- Pulmonary diseases e.g: Surfactant deficiency.
- Airway management e.g: Post surgical infant.
- Central cause's e.g: Apnoea.
- Abnormalities of muscles of respiration e.g: Myotonic dystrophy.
- Miscellaneous causes of respiratory failure e.g: Sepsis.

**KEY POINTS**

- ETT intubation is at least a two-person procedure and can be performed by staff deemed competent in this procedure.
- If a prolonged period of hypoxia or bradycardia occurs during an attempt at intubation, the procedure should be stopped and the infant given bag and mask resuscitation until stabilised. Depending on the level of experience, no more than two attempts should be made to intubate before handing over to a more experienced staff member.
- Sedation prior to intubation should be considered in infants >34weeks. Rapid sequence pre-medication may be delivered as below:
  - IV Morphine 100microg/kg
  - IV Atropine 20microg/kg
  - IV Suxamethonium 1-2mg/kg (suxamethonium should not be used if there is a suggestion of upper airway obstruction that may prevent intubation)
- Document endotracheal tube size and the position of the tube at the lips / nostril.

**EQUIPMENT**

Resuscitation equipment (NB. appropriate size mask / suction catheter)

<ul style="list-style-type: none"> <li>• Endotracheal tube (see Table 1).</li> <li>• Laryngoscope – size appropriate.</li> <li>• Magill forceps.</li> <li>• Scissors.</li> <li>• Introducer</li> <li>• Hydrocolloid tape (Comfeel) x 2.</li> <li>• Skin preparation wipe.</li> <li>• Brown skin tape (leucoplast) 2.5 cms wide</li> <li>• 2 lengths cut into trouser legs (oral)</li> <li>• 2 lengths cut into trouser legs/1 length cut in half lengthwise (nasal)</li> <li>• Size 6 suction catheter (for nasal intubation)</li> <li>• Black silk tie (nasal)</li> <li>• Cotton buds (nasal)</li> </ul>	<p>If using a NeoBar® Tube Holder to secure an oral ETT select the appropriate size by using the measuring strip enclosed in the tube holder package. Sizes range from mini to macro and are colour coordinated with the measuring strip.</p> <p>Hydrocolloid and leucoplast tape are not required with the NeoBar.</p>
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**Table 1: Tracheal Tube Size Guide**

WEIGHT	TUBE SIZE	POSITION AT NOSTRIL
< 700 grams	2.0 mm - 2.5 mm	6 cm
<1000 grams	2.5 mm - 3.0 mm	7 cm
1000 grams	3.0 mm - 3.5 mm	7.5cm
2000 grams	3.0 mm - 3.5 mm	9 cm
3000 grams	3.0 mm - 3.5 mm	10.5 cm
3500 grams	3.5 mm - 4.0 mm	11 cm

**(A) INSERTION OF AN ORAL ETT**

- Select tube size and if using an introducer insert it to the end of the tube and bend it slightly. This aids in providing traction for the tube to allow easy passage. Ensure it does not protrusion out of the end, may cause trauma or perforation.
- Position the infant supine with the head in a neutral position. Gently tilt the infant's head into a sniffing position. Over-extension of the neck will lift the pharynx out of view and collapse the trachea.
- Pass the laryngoscope blade gently along the right side of the mouth, pull the tongue and the epiglottis forward by exerting traction perpendicular to the blade of the laryngoscope. Care should be taken not to tilt the blade upward.
- Slide the laryngoscope blade back until the epiglottis and vocal cords come into view.
- Insert the ETT, pass through the cords, advancing no further when the entire black strip has passed through the cords.
- Ensure the ETT is advanced to the correct depth only and no further avoiding hyperinflation of the right lung and collapse of the left lung. Attach CO2 detector to confirm placement.
- Check breath sounds and chest wall movement are sufficient before securing the tube (see securing the tube below).
- Connect the infant to the ventilator ensuring stability of the ETT.

**STRAPPING OF AN ORAL ETT USING TAPE**

1. Apply hydrocolloid tape to both cheeks.
2. Apply the first trouser leg tape to the right cheek.
3. Place the upper leg across the top of the lip.
4. The lower leg is placed directly on the tube and it is wrapped around the tube in a spiral fashion.
5. The second trouser leg tape is applied to the left cheek, and the lower leg is placed across the lower lip.
6. The upper leg is placed directly on the tube and it is wrapped around the tube in a spiral fashion.

**STRAPPING OF AN ORAL ETT USING NEOBAR®**

1. Skin must be clean and dry before applying Skin preparation wipe to cheek areas if needed and allow wipe to dry.
2. Apply heat to tabs prior to applying for better adhesion.

3. NeoBar should never come into contact with the infant's lips i.e. should be 5mm from the lips and centred at the corners of the mouth.
4. Place ET tube underneath the stabilising platform to minimize trauma to the palate.
5. Place flaps in front of the ears and on the maxillary bone (hold flaps in place for 60 secs to ensure adhesion).
6. Wrap leucoplast tape once around the ETT first then once around the platform to secure.

## **(B) INSERTION OF A NASAL ETT**

- A size 6 suction catheter is passed through the ETT and initially passed via the nasal passage into the pharynx ensuring patency for the ETT and not penetration of the cribiform plate leading to frontal lobe trauma.
- Moisten the end of the ETT using sterile lubricant or sterile water, if necessary, to ease the passage of the tube reducing the mucosal trauma.
- Position the infant supine in the neutral position. Gently tilt the infant's head into a sniffing position. Over-extension of the neck will lift the pharynx out of view and collapse the trachea.
- Feed the ETT along the suction catheter into the nostril to a depth of only 1 – 1.5cm.
- Visualise the suction catheter in the pharynx using the laryngoscope.
- Avoid pressure on the infant's upper gum which may cause damage to the infant's tooth bud.
- Advance the ETT into the pharynx and withdraw the suction catheter.
- Using the Magills forceps position the ETT in the trachea, advancing no further than when the black strip has passed through the cords.
- Ensure the ETT is advanced to the correct depth only and no further avoiding hyperinflation of the right lung and collapse of the left lung. Attach CO2 detector to confirm placement.
- Check breath sounds and chest wall movement are sufficient before securing the tube (see securing the tube below).
- Connect to a ventilator ensuring stability of the ETT.

## **STRAPPING OF A NASAL ETT**

1. Tie a piece of black silk around the endotracheal tube level with the nostril, and knot twice, taking care not to occlude the tube.
2. Apply hydrocolloid tape to both cheeks, and hold both ends of the black silk across the cheeks.
3. Place the narrow piece of leucoplast along the bridge of the nose extending straight up the ETT.
4. Apply the first trouser leg to the cheek that is on the same side as the nostril with the tube
5. Place the lower leg across the upper lip, to the other cheek, ensuring the black silk is covered.
6. The upper leg is applied directly onto the tube and it is wrapped around the tube in a spiral fashion.
7. The second trouser leg is applied to the other cheek.
8. The upper leg is taken across the bridge of the nose to the other cheek.
9. The lower leg is taken under the tube and is wrapped around the tube in a spiral fashion.
10. Ensure the nostril without the tube is not occluded.

## **SHORTENING THE DEAD SPACE ON THE ETT**

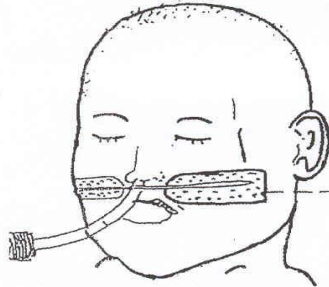
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Shortening the dead space on the Endotracheal Tube optimises ventilation.

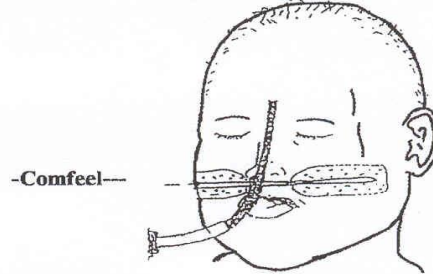
### **PROCEDURE**

1. Do not shorten the ETT until you have ascertained that it is in at the correct depth, i.e. in case it needs to be advanced. Leave a minimum of 5cm from the nares or mouth.
2. Ensure the infant is stable, settled and restrained if necessary.

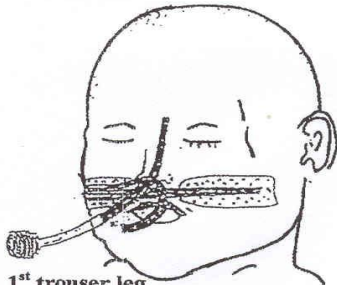
3. If Ballards suction device is in place, make sure the catheter is completely clear of the interior of the ETT or that the device has been disconnected from the ventilator circuit.
4. Use sterile scissors, cutting the ETT on a slight angle makes it easier to reintroduce the ETT connector afterwards. For ease of measuring when suctioning, make sure the 'cm' markings are visible at the cut end of the ETT.



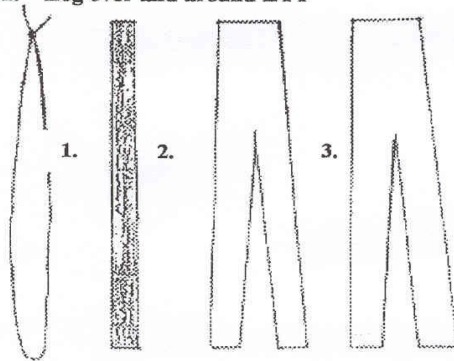
1. SILK TIE



2. Straight tape down nose and up the ETT tube



3. 1<sup>st</sup> trouser leg  
 1. Leg under ETT and across top lip  
 2. Leg over and around ETT



4. 2<sup>nd</sup> trouser leg on opposite cheek  
 1. Leg across nose  
 2. Leg under and around ETT

**NB Ensure other nostril is not occluded**

**Silk tie and tapes for nasal endotracheal tube**