CLINICAL GUIDELINE	
Intubation and Ventilation	
Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

This document should be read in conjunction with this DISCLAIMER

Key Points

- This is at least a 2-person procedure.
- Preparation is paramount.
- Check the equipment prior to the procedure and make sure all equipment is present and working.
- Establish IV access before intubating (unless in an emergency).
- Assess airway patency with bag and mask or T-piece resuscitator before proceeding with intubation. If unable to obtain chest expansion, there may be upper airway obstruction.

Nasal vs Oral Intubation

- Babies can be safely transported with an oral ETT. There is no need to preferentially insert a nasal ETT, especially if not confident with the procedure.
- Oral ETT's should always be inserted for urgent intubations, and need **not** be replaced by nasal ETT's once the baby is stabilised.
- Shouldered (Coles) ETT's are **not** to be used in any circumstances.
- Pre-intubation sedation should be considered in **all** infants, especially vigorous, term infants. Rapid sequence pre-medication is as follows:
    - **Fentanyl** 4 micrograms/kg IV. Note: given by slow IV push over 2 minutes (chest wall rigidity can occur with rapid administration).
        - If Fentanyl not available, **Morphine** 100-200 micrograms/kg IV can be used instead. NB: takes at least 5 minutes to take effect.
    - **Atropine** 20 micrograms/kg IV.
    - **Suxamethonium** 2 mg/kg IV.
        - Note: do not use if upper airway obstruction suspected.
        - Do not use in cases of hyperkalaemia, myopathy and raised intracranial pressure.

Common Intubation Problems

- Inadequate preparation / faulty equipment.
- Inadequate sedation.
- Over-extension of the neck.
- Not using cricoid pressure.
- Over-insertion of the ETT (into the right main-stem bronchus).

Guide for Endotracheal Tube Size

Age	Weight kg	ETT size mm	At lips cm	At nose cm
Newborn	< 0.7	2.0-2.5	5.0-5.5	6-7
Newborn	< 1	2.5	5.5-6.0	7-7.5
Newborn	1	2.5	6-6.5	7.5
Newborn	2.0	3.0	7	9
Newborn	3.0	3.0-3.5	8.5	10.5
Newborn	3.5	3.5	9	11
3 months	6	3.5-4.0	10	12

PLEASE NOTE: For an oral intubation, a rough rule of thumb, the level to strap the ETT at the lips is: 6 + weight (kg) = cm level at lips for example; for a 3 kg baby: 6 + 3 = 9cm at the lips.

Management and Monitoring of a Ventilated Baby During Transport

- ECG, SpO_2, Transcutaneous CO_2 and/or end-tidal CO_2 monitoring are essential for all ventilated infants.
- Monitor chest wall movement and spontaneous respiratory effort.
- Ensure inspired gases are warmed and humidified.
- Sedation may be necessary (Morphine infusion).
- Muscle relaxation (Pancuronium / Vecuronium boluses or infusions) are usually reserved for very sick infants e.g. Meconium aspiration, diaphragmatic hernias.

If the Baby Deteriorates After Initiation of Ventilation

- Check that there is adequate gas flow (minimum 6-8 L/min).
- Check that no disconnection in tubing has occurred.
- Check ETT patent (suction).
- Check ETT not displaced (direct vision, Pedicap/CO_2 detector).
- ETT size (e.g. too small- leak around tube).
- Exclude a pneumothorax.

Note: Do not unnecessarily re-intubate if the ETT is patent, in the right position, & with no significant leak.

Overventilation

- This is common, especially after administration of surfactant and in asphyxiated/ cardiac babies (who have little lung disease).

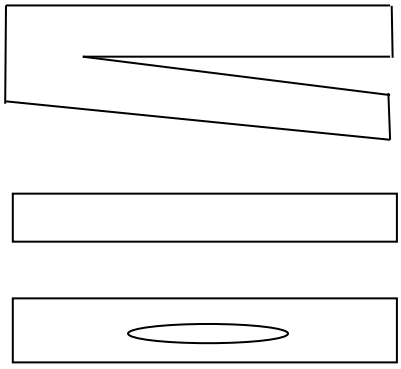
- Monitor Transcutaneous CO_2 whenever ventilating; check formal blood gas if Transcutaneous / end-tidal CO_2 falling.

Guidelines for Strapping Endotracheal Tubes

There are many ways of strapping an ETT securely.

The NETS team must ensure that it is secure prior to departure.

Strapping Required



A Strap - 2 required

B Strap - anchor strap

C Strap - securing strap for oral ETT(optional)

Step 1: Cut 2 x “trouser legs” with the tape -“A strap.”
The legs need to be longer for oral strapping.

Step 2: Cut one narrow strip of tape - "B strap."

Step 3: Cut one wider strap with a “slit” in the middle the length of the baby’s mouth -“C strap.”(optional)

Nasal ETT requires a double black silk suture - (pre-cut silk with a knot tied at open end).

Alternatively, a Neobar® Tube holder can be used to secure an oral ETT.

Guidelines for Strapping Oral Endotracheal Tubes

Step 1: Place hydrocolloid tape (Comfeel) to both cheeks from the edge of the mouth (Figure 1).

Step 2: Place the oral ETT to one corner of the mouth.

Step 3: Place a "B strap" from the side of the ETT on the cheek and extend up the ETT (Figure 2).

Step 4: Place an “A strap” with the non-split end on the cheek from the corner of the mouth where the ETT is. Place the upper leg across the top of the lip (Figure 3) and then the lower leg is wrapped around the ETT in a spiral fashion.

Step 5: Place a second “A strap” on the opposite cheek from the corner of the mouth. The lower leg is placed across the lower lip and the upper leg is then wrapped around the ETT in a spiral fashion (Figure 4).

Step 6: Feed "C strap" over the end of the ETT and then adhere it on top of both the “A straps” so as to secure all straps to the face (Figure 5).

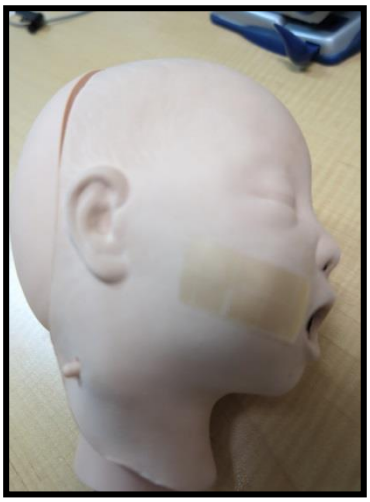


Figure 1
Hydrocolloid Tape Placement

Figure 2
B Strap - Anchor Strap

Figure 3
A Strap

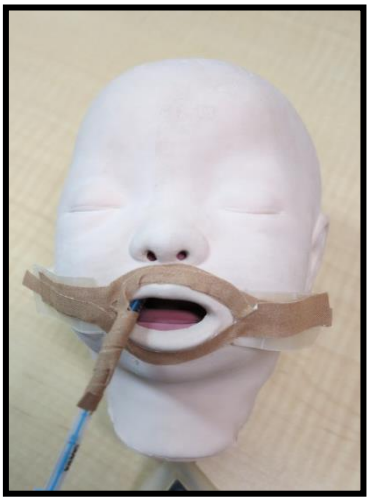


Figure 4
Second A Strap

Figure 5
C Strap - Front View

Guidelines for Strapping a Nasal Endotracheal Tubes

Step 1: Place hydrocolloid tape (Comfeel) to both cheeks from the edge of the mouth (Figure 1).

Step 2: Tie a double knot with a double black silk suture around the base of the ETT at the depth it is to be secured, taking care not to occlude the tube. Hold both ends of the black silk across the cheeks (Figure 2).

Step 3: Place a "B strap" from the forehead, down the bridge of the nose and extend up the ETT (Figure 3).

Step 4: Place an “A strap” with the non-split end to the cheek that is on the same side as the nostril with the ETT. Place the lower leg across the top of the lip, to the other cheek securing the knot in the tie and ensuring the black silk is covered (Figure 4). The upper leg is then wrapped around the ETT in a spiral fashion.

Step 5: Place a second “A strap” on the opposite cheek (Figure 5). The upper leg

is taken across the bridge of the nose to the other cheek. The lower leg is taken under the ETT and is wrapped around the tube in a spiral fashion. The other nostril should not be occluded by any tape or silk tie.

Figure 1
Hydrocolloid Tape Placement

Figure 2
Double knot with silk

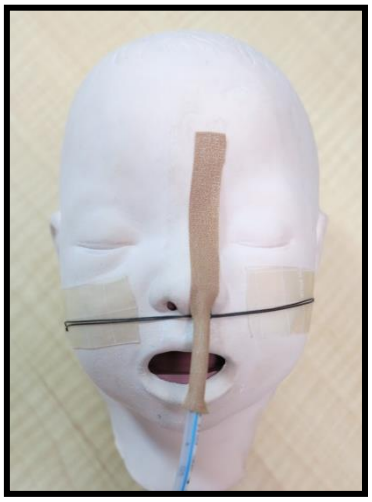


Figure 3
B Strap - Anchor Strap

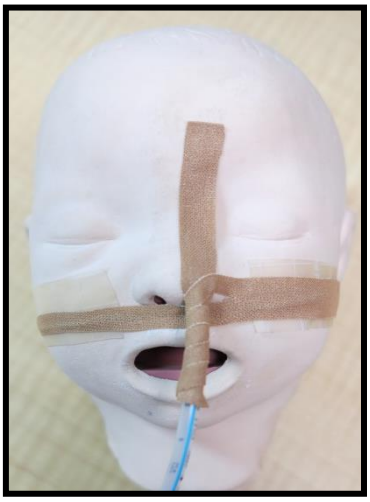


Figure 4
A Strap

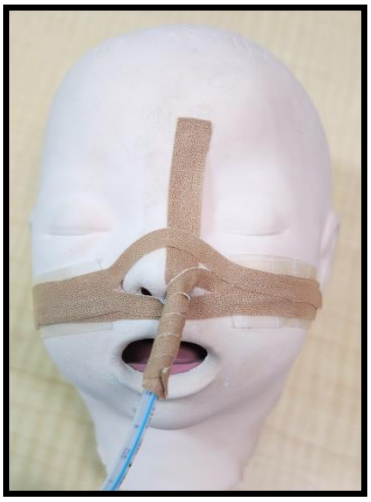


Figure 5
Second A Strap

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