

Newborn Critical Care Center (NCCC) Clinical Guidelines

Procedural Guideline for Intubation by House Staff

PURPOSE

To provide guidance to those working in the Newborn Critical Care Center regarding the number of times house staff should be permitted to attempt an intubation before the Fellow / Attending / NNP takes over the procedure. The development of competency among house staff in the performance of endotracheal intubation requires repeated performances of this procedure. However, decisions regarding when they should attempt the procedure and how many times they should attempt the procedure on an individual patient should be made with consideration of patient safety as a high priority. Before each delivery, one person should be assigned by an experienced staff member (attending, fellow or NNP) to manage the airway based on these guidelines. Following assignment of responsibility, a determination should be made regarding the number of attempts permitted if the procedure is not initially successful. The supervising physician may choose to allow more intubation attempts than are stated in these guidelines at his/her discretion.

RECOMMENDATIONS BY SITUATION AND/OR DIAGNOSIS

1. Recent Upper Airway Surgery:

All intubation attempts MUST be performed by the most experienced provider available.

- Esophageal atresia / tracheoesophageal fistula repair
- Cricoid split

2. Extremely Low Birth Weight Infants:

An experienced provider should perform intubations of ELBW's in the delivery room and for the first 72 hours of life.

3. High Risk or Critical Situations:

The procedure should not be attempted by interns; residents may be allowed at most two attempts at senior provider discretion if there is adequate time to administer pre-medications and/or the resident has had multiple successful intubations previously.

- **In the delivery room:** congenital diaphragmatic hernia, severe arthrogyrosis, antenatal concern for airway anomaly.
- **In the NCCC:** fentanyl induced chest wall rigidity, severe subglottic stenosis, premature infants with significant O₂ requirement/respiratory instability (ie: ≤ 27 weeks + FiO₂ > 0.5; > 27 weeks + FiO₂ > 0.7)

4. Low risk situations:

Interns or senior residents should be allowed up to two attempts after administration of the intubation pre-medications.

- Elective intubations for surgery/procedures, respiratory distress in term infants, intubations in otherwise stable preterm infants.

PROCEDURAL GUIDELINES

Laryngoscopy and intubation can cause bradycardia, hypoxemia, and increased intracranial pressure – which may lead to IVH. Premedication can mitigate some of these effects (see [Intubation Premedication](#)). The following are general guidelines for the selection of the correct sized tube and the correct insertion depth.

To estimate the distance between the lip and mid-trachea (the desired location of the tip of the endotracheal tube):

$$\text{Patient's Weight (kg)} + 6 = \text{Measurement at the lip in cm}$$

This technique for estimation is less reliable in infants weighing less than 750g.

Ensure that all equipment and support staff are at the bedside prior to beginning an intubation attempt. Blood oxygen saturations should be monitored before and throughout the procedure. Limit an attempt to 30 seconds. Evaluate breath sounds and chest rise along with color change on CO2 detector to determine correct ETT placement.

Weight	Gestational Age	ETT Size	Blade Size
<1000 g	< 28 weeks	2.5	00 / 0
1,000 - 2,000 g	28 - 34 weeks	3.0	0
2,000 - 3,000 g	34 - 38 weeks	3.5	0/1
> 3,000 g	> 38 weeks	4.0	1

Equipment:

- Laryngoscope
- Correct sized blade for gestational age and weight of infant
- 8 Fr suction catheter
- Stylet
- Appropriate size ETTs (backup at bedside and possibly one size smaller)
- Tape to secure the ETT
- Functioning suction
- Stethoscope
- NeoPuff (or other T-piece resuscitator) – assure proper settings for PIP / PEEP and function

Personnel Needed at Bedside:

- Bedside RN
- Respiratory therapist
- Resident and Fellow (if resident performing intubation, fellow or NNP must be present)
- NNP (only NNP needed if NNP intubating)

Technique :

1. Ensure all equipment and personnel are present and ready at the bedside.
2. Consider premedication as per [Intubation Premedication](#) protocol if not an emergent intubation.
3. Ensure vital signs are normal prior to first attempt. This may require PPV and oxygen administration. Observation of vital signs is mandatory throughout procedure. Abort intubation attempts with any infant decompensation.
4. Slightly extend infant's head into "sniffing" position and maintain midline position. A neck roll may be utilized to establish this position.
5. Gently suction the oropharynx of secretions to optimize visualization.
6. The laryngoscope should be held in the left hand. With the right hand, open the infant's mouth and depress the tongue.
7. Insert laryngoscope sliding over the tongue until the tip of the blade is resting in vallecula.
8. Lift the laryngoscope to open the mouth further and visualize the airway. Look for the vocal cords. When lifting the blade, raise the entire blade in the direction that the handle is pointing and be cautious **NOT** to rock the blade. Attempt should take no longer than 30 seconds.
9. Suction as necessary to remove secretions with 8 Fr catheter.
10. Have an assistant apply gentle cricoid pressure as necessary to bring the larynx into view.
11. Once seen, maintain visualization of the vocal cords at all times.
12. Hold ETT in right hand and insert in the right side of the mouth outside of the laryngoscope blade.
13. Insert the ETT through the vocal cords to calculated depth, do **NOT** force through the cords.
14. If ETT appears too large or does not pass easily, decrease angle of neck extension and/or decrease ETT size.
15. Confirm appropriate position of ETT using a capnograph (CO₂ detector) and watching for color change from purple to yellow. Color change may not immediately occur if infant is an ELBW or in a code situation.
16. Auscultate the chest to ensure equal aeration of both lungs and observation of chest movement with positive pressure ventilation. If breath sounds are diminished over left lung, attempt pulling back ETT slightly as it may be positioned in the right mainstem bronchus.
17. Secure ETT with tape.
18. Attach appropriate ventilatory device with appropriate settings.
19. Order and evaluate a chest radiograph for correct placement. The ETT should ideally be located midway between the thoracic inlet and the carina. Make appropriate adjustments.
20. Document procedure appropriately.