UC DAVIS HEALTH | CHILDREN'S HOSPITAL

NICU Intubation Guidelines

Intubation Attempt* Guidelines by Provider Experience

Infant		Intubator		
		Advanced *(10+ successful intubations, with at least 3 of those in infants under 30 weeks)*	**Intermediate** *(3-10 successful intubations, or 10+ intubations with <3 infants under 30 weeks)*	**Beginner** *(0-2 successful intubations)*
22-23⁶ weeks CGA	< 72 hrs	Yes	No	No
	> 72 hrs	Yes	Yes, 1 attempt	No
24-26⁶ weeks CGA	< 72 hrs	Yes	Yes, 1 attempt	No
	> 72 hrs	Yes	Yes	Yes, 1 attempt
≥ 27 weeks CGA		Yes	Yes	Yes, 1 attempt
Difficult airways†		Yes	No	No

*Attempt = placing laryngoscope in the oropharynx

Number of attempts: Unless otherwise specified in the above chart, a provider should have no more than 2 attempts before allowing a more experienced provider to take over.

†Difficult airways: Esophageal/tracheal repair/perforation, subglottic stenosis, micrognathia, known to be very anterior, history of complicated intubation or PCAT in the past.

Notes/definitions

Beginners should ALWAYS use a video laryngoscope with supervisor watching positioning and placement in the video. The intubator may choose to perform intubation under direct laryngoscopy or by using the video screen.

PCAT: For difficult airways, or airway emergencies, consider PCAT activation (4-3666).

Cuffed ET tubes: Consider 3.0 or 3.5 cuffed ET tube for infants with congenital heart disease (CHD), congenital diaphragmatic hernia (CDH), tracheoesophageal fistula (TEF), abdominal wall defects, or need for surgical procedure.

Tiers and Priority

If there are 2 or more qualified persons to intubate a selected patient per the above table, refer to the tiers below to determine priority. Gestational age of the patient is not factored into assigning priority for intubations. If there are no staff members that meet criteria for priorities 1-4, priority goes back to the fellows. Fellows who still need intubations to meet maintenance criteria should be prioritized over fellows who have already met maintenance requirements for the 6-month period.

Intubation priority is to be discussed during each shift at SAM (0815/2015). Priorities assigned during SAM are in effect until the subsequent SAM (i.e., priorities are not re-assigned at provider change-of-shift). If the individual listed as Priority #1 during SAM is no longer present in the hospital, then proceed down the priority list in order before moving to staff from the second shift.

See Page 3 for Competency/Maintenance requirements for each discipline.

Note: These guidelines are meant to be a framework to promote patient safety and procedure equity. Deviations from these guidelines are allowed at the discretion of the attending physician.

Tier 1	1. Fellows have first right of refusal for all appropriate‡ intubations until they reach intermediate	
Tier 2	2. NNP/Neonatal Transport RN non-compliant with maintenance requirements.	Tie breaker = date of last live intubation
	3. Fellow/NNP/Neonatal Transport RN needing an intubation for maintenance.	Tie breaker = date of last live intubation
	4. NNP/Neonatal Transport RN needing an intubation for initial competence.	Tie breaker = orientation end date
	5. Fellow needing an intubation for maintenance.	

‡Staff members at the beginner level may be assigned ETT for the code team with a back-up intubator who is at least intermediate level.

Competency/Maintenance Requirements

Note: Successful LISA administration utilizing VL counts as a successful intubation for both initial competency and maintenance.

Fellows:

Initial competency: 3 successful intubations (intermediate level)

Maintenance: 4 successful intubations per 6-month period (July-December, January-June)

NNPs and hospitalists:

See Endotracheal Intubation (Standardized Procedure 128).

Initial competency (new grad NNP): 10 successful live intubations

A new hire NNP with previous experience may enter in the maintenance phase, per the discretion of the NNP Supervisor.

Maintenance: Minimum of 3 successful live intubations and 2 simulations per credentialing year period. For transport-trained NNPs, goal is to have 4 successful live intubations per credentialing year. If this cannot be achieved, the transport-trained NNP may utilize 2 simulations.

Neonatal Transport RNs:

See Neonatal Transport Team Structure Standards (22026, Attachment 4).

Initial competency: 10 successful simulated intubations and 4 successful live intubations

Maintenance: 1 successful live intubation per fiscal year quarter

- Once the RN reaches the advanced level in accordance with this guideline, simulation may be used in place of live intubation once per fiscal year.
- RNs in the orientation phase must complete 4 live intubations prior to the orientation end date. An RN newly off orientation may not function in the T1 or T2 role until they have completed 4 successful live intubations.
- RNs who are in the maintenance phase and become non-compliant may only function in the T1 or T2 role if the other team member is a compliant, advanced intubator.
- RNs returning from a leave of 3 months or more must complete 3 successful proctored simulations upon return.

Pre-Procedure Checklists

Provider

- ❑ **Place Orders:**
  - RSI medications
  - STAT CXR
  - Blood gas/lytes/lactate
  - Vent settings
- ❑ **Gather/confirm intubation equipment***
- ❑ **Notify Attending**
- ❑ **Notify parent(s)**
- ❑ **Review medical/airway history**

RN1

- ❑ **Establish IV access, if needed**
- ❑ **Notify RT and RN2**
- ❑ **Gather intubation equipment and supplies***
- ❑ **Connect catheter suction (8/10 Fr)**
- ❑ **Ensure updated Code Sheet at bedside**
- ❑ **Draw up meds**

Notify Provider and RT when meds are drawn up

Respiratory Therapist

- ❑ **Gather supplies***
  - CO_2 detector
  - Ventilator
- ❑ **Verify T-piece/bag settings**

***Intubation Equipment:**

- Intubation Box
- Laryngoscope (standard, NeoView, C-MAC)
- ET tube (cuffed/uncuffed, +/- stylet)
- Suction (catheter and little sucker)
- Stethoscope
- CO_2 detector
- Appropriate size mask
- T-piece/bag with appropriate settings
- Ventilator with appropriate settings
- Code Cart (awareness of location)
- LMA, if needed
- Taping supplies

Pre-Procedure Timeout (Led by Provider)

- ❑ **Provider (+/- Attending/Fellow), RN, RT all present at bedside**
- ❑ **Confirm Patient ID, Procedure, and review roles†**
- ❑ **Administer pre-intubation medications**
- ❑ **Position/suction infant, optimize bed height**

†Roles:

Intubator – Lead Timeout and intubate, confirm equipment list above
Assistant – Hand ET tube, auscultate HR, watch vitals
Back-up intubator – Attempt intubation if first intubator is unsuccessful
RT – hand ventilation and pre-oxygenation prior to intubation, CO_2 detection and ventilation after intubation, adjust pressure/FiO_2 as needed, secure ETT with RN, place on ventilator
RN1 – Administer meds, position infant during intubation, secure ETT with RT, call for x-ray, obtain gas post-intubation, document Timeout in EMR
RN2 – Support for RN1, crowd control
Attending/fellow – Supervise procedure, serve as Code Leader (if needed)

Procedure: Intubation

Provider

- ❑ **Confirm ETT placement**
  - Equal breath sounds
  - Mist in tube
  - Capnography color change
  - Vital signs
- ❑ **Document in Procedure Note**
- ❑ **Update parent(s)**

RN1

- ❑ **Secure ET tube**
- ❑ **Call for STAT CXR**
- ❑ **Obtain blood gas in 15-30 minutes**

Respiratory Therapist

- ❑ **Secure ET tube with RN**
- ❑ **Transition to ventilator**

Pre-medication for non-emergency tracheal intubation in the NICU

Background: Premedication for intubation of the neonate improves intubating conditions, decreases the time and number of attempts needed to complete the procedure, and decreases the potential for intubation-related airway trauma.[1] In addition, intubation is an unpleasant and painful experience. A consensus statement from the International Evidence-based Group for Neonatal Pain includes this phrase: “tracheal intubation without the use of analgesia or sedation should be performed only for resuscitation in the delivery room or for life threatening situations associated with the unavailability of intravenous access.”[2]

A 2010 Clinical Report by the AAP COFN states, “except for emergent intubation during resuscitation either in the delivery room or after acute deterioration or critical illness at a later age, premedication should be used for all endotracheal intubations in newborns. Medications with rapid onset and short duration of action are preferable.”[3] The AAP makes the following recommendations:

- Analgesic agents or anesthetic dose of a hypnotic drug should be given.
- Vagolytic agents and rapid-onset muscle relaxants should be considered.
- Use of sedatives alone such as benzodiazepines without analgesic agents should be avoided.
- A muscle relaxant without an analgesic agent should not be used.

Preferred agents for non-emergent intubations in the UCD NICU

- Atropine (vagolytic): 0.02 mg/kg IV
- Fentanyl (analgesic): 2 mcg/kg IV over 5 minutes (can repeat, if needed)
- Rocuronium (muscle relaxant, optional; consider having drawn up at bedside prior to fentanyl administration): 0.5 mg/kg IV

Notes:

- *Vecuronium (0.1 mg/kg) can be used as an alternative to rocuronium for muscle relaxation. It has a slower onset of action and longer half life compared to rocuronium.*
- *Slow infusion of fentanyl decreases the risk of chest wall rigidity (which can be treated with naloxone and/or rocuronium/vecuronium).*
- *Fentanyl and atropine can also be given IM, if IV access cannot be established.*

References

1. Shah, Vibhuti, and Arne Ohlsson. 2002. “The Effectiveness of Premedication for Endotracheal Intubation in Mechanically Ventilated Neonates. A Systematic Review.” *Clinics in Perinatology* 29 (3): 535–54.
2. Anand, K. J., and International Evidence-Based Group for Neonatal Pain. 2001. “Consensus Statement for the Prevention and Management of Pain in the Newborn.” *Archives of Pediatrics & Adolescent Medicine* 155 (2): 173–80.
3. Kumar, Praveen, Susan E. Denson, Thomas J. Mancuso, and Committee on Fetus and Newborn, Section on Anesthesiology and Pain Medicine. 2010. “Premedication for Nonemergency Endotracheal Intubation in the Neonate.” *Pediatrics* 125 (3): 608–15.

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