UC DAVIS HEALTH | CHILDREN'S HOSPITAL

Quick Reference: Neonatal Stabilization Priorities

Prioritize NRP then S.T.A.B.L.E Recommendations

- **Resuscitation per NRP:** Prioritize airway ventilation FIRST with neonates. The most important intervention is effective ventilation of the newborn lungs! Obtain effective ventilation PRIOR to initiating chest compressions, evidenced by slight chest rise, +breath sounds, rising heart rate, +CO2 detector/colormetric device color change via mask, supraglottic airway or ETT PPV. Refer to NRP algorithm for ETT size, depth, epinephrine dose and volume dose with NS or PRBC's (10mls/kg).
- **Sugar Stabilization:** neonatal MIVF infusion rate = 60ml - 100ml/kg/day with D10W
    - 100ml/kg/day = ~4ml/kg/hr
    - 80ml/kg/day = ~ 3.5ml/kg/hr
    - 60ml/kg/day = ~ 2.5ml/kg/hr
    - For hypoglycemia <50: place PIV (24g), administer D10W bolus 2-3ml/kg IV, initiate MIVF per above and obtain follow up POC BG within 15-30 minutes. Prewarm the heel when obtaining POC BG via heel sticks. If needed, repeat D10W bolus and increase MIVF glucose infusion rate.
- **Temperature:** normal temperature = 36.6-37.5 C, utilize radiant warmer on servo (baby) control mode. Set servo control (desired baby temp) @ 36.5-37 C. Place radiant warmer temperature probe on left or right abdomen or either axilla. Additionally, obtain intermittent axillary temperatures.
- **Airway:** Assess respiratory status focused on optimizing oxygenation and ventilation. Based on condition, consider use of humidified nasal cannula, heated and humidified high flow nasal cannula (HFNC) or nasal CPAP (NCPAP). Apply pulse oximeter on right wrist (preductal), ventilate, oxygenate, suction and/or insert orogastric tube as needed. If PPV indicated, start with pressures of PIP 20/PEEP 5 with ventilation rate of 40-60/min. Use T-piece ventilation device (if able) to more accurately control ventilation pressures.
    - See Quick Reference: Neonatal HFNC and NCPAP & Neonatal OGT Placement
- **Blood Pressure:** assess blood pressure (goal NBP MAP = gestational age +/-2), pulses (brachial and femoral), and perfusion parameters (capilary refill, skin color, skin temperature, LOC, UOP)
- **Labs**: 4 B's = blood glucose, blood gas (CBG, VBG or ABG), blood count (CBCw/diff), blood culture
- **Emotional Support**: provide clinical update to family, discuss plan of care, including possible transport

Post-resuscitation and Pre-transport Monitoring

- Ongoing monitoring of heart rate, Sp02, temperature, blood pressure and perfusion Q 15-30min
- Obtain IV access, if indicated administer volume bolus to support perfusion. Follow NRP guidelines for IVF bolus to support blood pressure/perfusion (NS 10ml/kg over 10-20 minutes)
- Consider early antibiotics. If unable to obtain IV access, consider administering antibiotics IM (depending on drug). (Note: Ceftriaxone is not recommended for neonates)
- **UC Davis Children's Hospital Telemedicine**: consult and/or arrange for transport for higher level of care

To use UC Davis Children's Hospital Telemedicine or to arrange a transport request: 1-800-UCD-4-KIDS

References

1. Neonatal Resuscitation Program 8th Edition. American Academy of Pediatrics 2021
2. The STABLE Program: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed. 2024
3. Pediatric Advanced Life Support. AHA. 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2020 Oct 20;14

Quick Reference: Neonatal High Flow Nasal Cannula & Nasal CPAP

Indication for HFNC & NCPAP: to improve work of breathing and/or gas exchange

High Flow Nasal Cannula (HFNC)

- Provides positive airway pressure with heated and humidified gas thru an open/unsealed system using a nasal cannula interface in spontaneously breathing newborns
  - Flow rate is based on patient weight and condition, generating a low level of pressure
- **HFNC size selection**: Use manufacturer nasal cannula sizing guide
  - Cannula selection based on nare size should be ~50% nare occlusion
  - Note: cannula should not completely occlude nares
- **Recommended flow rates for initiation of neonatal HFNC:** 4 – 6 lpm
  - As needed, increase flow rate (lpm) based on patient condition

Nasal CPAP (NCPAP)

- Provides positive airway pressure with heated and humidified gas thru a closed/sealed system using a nasal mask or prong interface in spontaneously breathing newborns
- **Recommended NCPAP pressure**: 4-8 cm
- **Flow for bubble NCPAP should be 6-10 lpm (this flow rate is needed for the system to function properly)**
- **Nasal mask & prong size selection**: Use manufacturer sizing guide
- **CPAP Bonnet Size**: Measure OFC for bonnet size selection
- Nasal mask(s) and/or prongs should be rotated ~ Q 6 hours to reduce skin/septal irritation
- To maintain NCPAP pressures: Ensure system does not have any leaks, consider use of a pacifier and/or chin strap as needed. For bubble CPAP: Ensure continuous bubbling in water chamber

4 "F's" For Troubleshooting HFNC and/or Nasal CPAP: FIT, FLOW, FUNCTION & FiO2

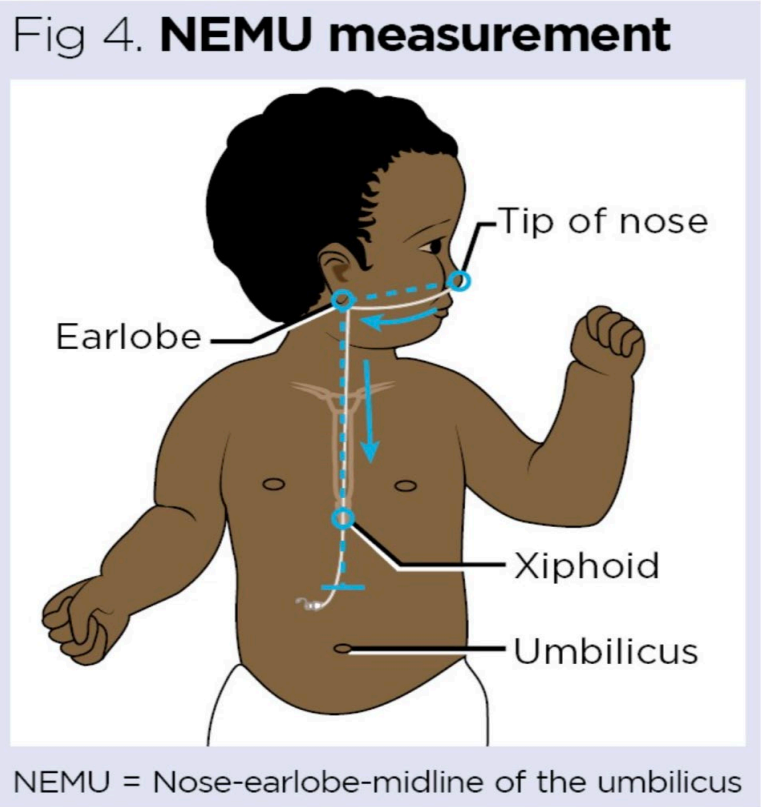
- **FIT**: Ensure proper **FIT** of high flow nasal CANNULA or NCPAP MASK/PRONGS
- **FLOW**: Ensure adequate and correct **FLOW** for HFNC or NCPAP set up
- **FUNCTION**: Confirm HFNC or NCPAP is **FUNCTIONING** as desired
  - Confirm HFNC or NCPAP pressure delivery as ordered by provider
  - If bubble NCPAP is in use, ensure continuous bubbling in water chamber
    - Note: if bubbling is not present, troubleshoot for leaks in the system
- **Fi02:** utilize an oxygen blender and provide supplemental O2 to optimize oxygenation

For pre-transport stabilization questions or to arrange a transport request: 1-800-UCD-4-KIDS

References

1. https://www.nursingtimes.net/roles/childrens-nurses/nasogastric-tube-insertion-1-children-and-young-people-25-07-2022/. Accessed May 4th, 2024
2. Neonatal Resuscitation Program 8th Edition. American Academy of Pediatrics 2021
3. The STABLE Program: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed. 2024
4. Neonatal NHF Therapy Overview | Fisher & Paykel Healthcare (fphcare.com). Accessed September 8, 2024

Quick Reference: Neonatal OG Tube Placement



- **Indication**: For gastric decompression to optimize lung inflation and ventilation
  - Newborns receiving PPV, CPAP (nasal or mask) and/or HFNC (>2 lpm)
- **NEMU measurement for OG tube placement**: Measure gastric tube from (1) tip of mouth or nose to earlobe (2) earlobe to midpoint between xiphoid and umbilicus
  - Note cm marking on the tube at xiphoid-umbilicus midpoint for securement reference
- **Securing OG tube catheter**: secure onto chin with tegaderm/tape
- **To decompress the stomach**: attach a syringe to OGT and either manually withdraw gastric air/contents and/or remove plunger from syringe and leave open to air for passive air removal to provide a vent for air entering the stomach
- **Confirmation of OGT placement**: test gastric aspirate with pH paper (<5), air/gastric content removal and/or obtain xray to confirm tip of OGT in the stomach
- **Supplies needed:** OG tube size 6.5F (preterm) or 8F (term), 20-30 ml syringe, and tegaderm

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Reference:

1. https://www.nursingtimes.net/roles/childrens-nurses/nasogastric-tube-insertion-1-children-and-young-people-25-07-2022/. Accessed May 4th, 2024
2. Neonatal Resuscitation Program 8th Edition. American Academy of Pediatrics 2021
3. The STABLE Program: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed. 2024

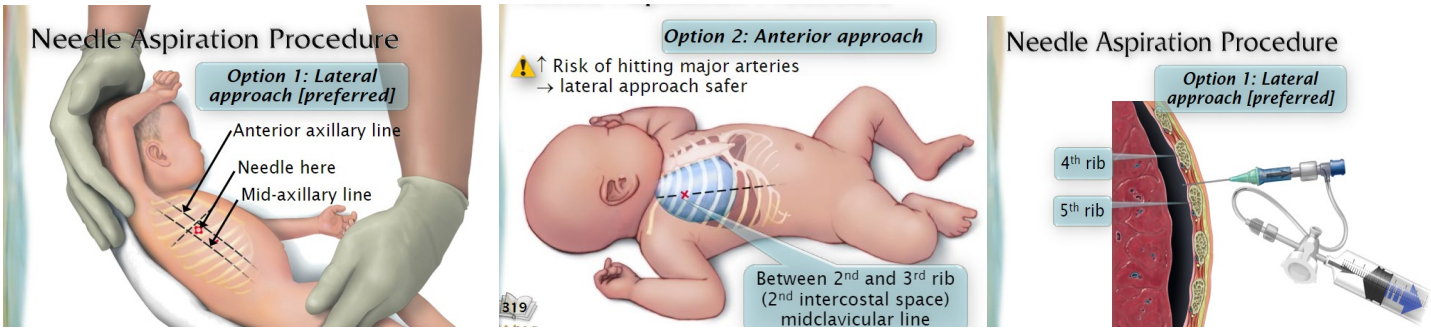
Quick Reference: Neonatal Needle Decompression

Indication: Tension pneumothorax (see images below) air escapes from air sacs in the lungs into the pleural space compressing lung tissue and impairing cardiac output

Signs & Symptoms: labored breathing, low sp02, hypoxia, bradycardia, poor perfusion, hypotension, chest asymmetry, asymmetric breath sounds, shift in PMI (heart sounds), poor peripheral pulses and perfusion

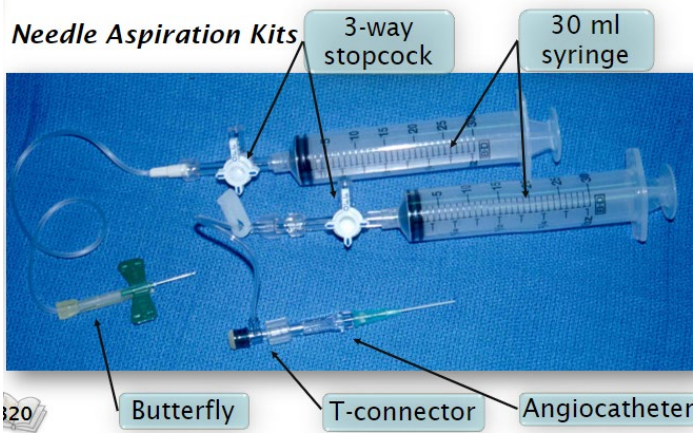
Approaches for Needle Decompression: see images below

- (1) Lateral mid-axillary between 4th and 5th rib (4th intercostal space), turn infant with affected side up
- Or, (2) Anterior midclavicular between 2nd and 3rd rib (2nd intercostal space), patient positioned supine
- Either method, catheter inserts ABOVE the rib



Images Source: The STABLE Prog ram: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed. 2024

Supplies Needed & Needle Aspiration Set-Up: 20-24 gauge angiocatheter (depends on pt size/gestational age) or 23 gauge butterfly needle,T-connector IV extension tubing (if using angiocatheter), 30ml syringe, stopcock, antiseptic skin prep, gauze, Tegaderm



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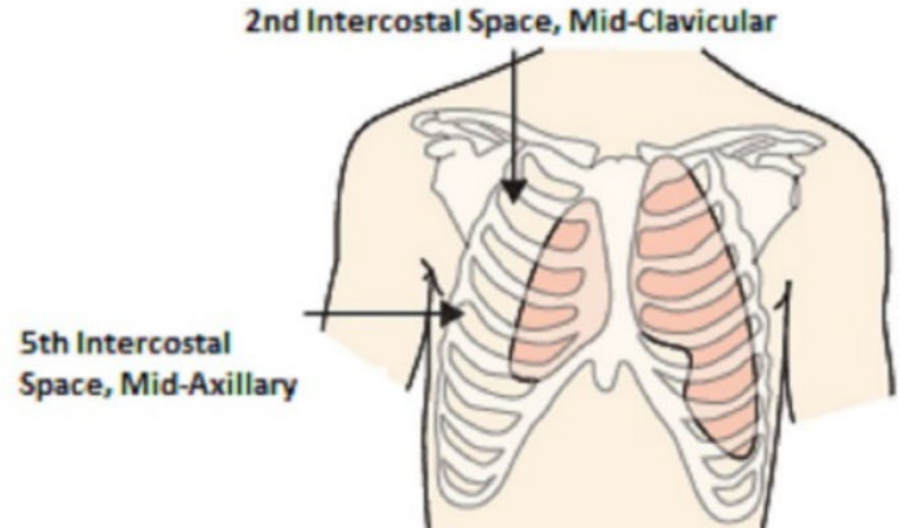
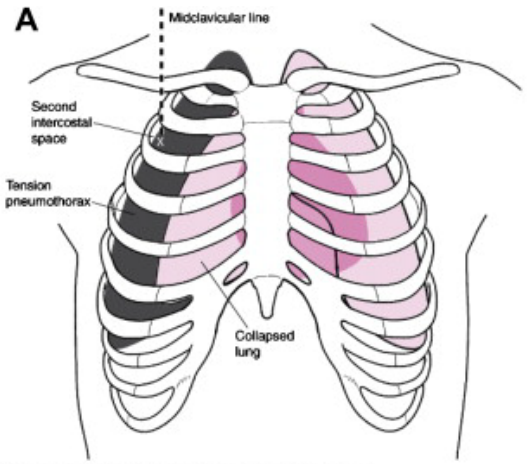
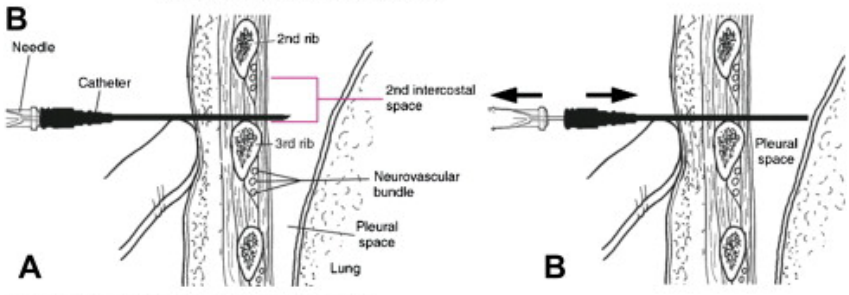
References:
Neonatal Resuscitation Program 8th Edition. American Academy of Pediatrics 2021
The STABLE Program: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed. 2024

Neonatal Needle Decompression: Landmarks For Insertion Sites







References:
Image Sources: https://obgynkey.com/pneumothorax-pneumomediastinum-and-pulmonary-embolism/. Accessed May 2024

Updated: YG, 08.10.2025

Medical Disclaimer

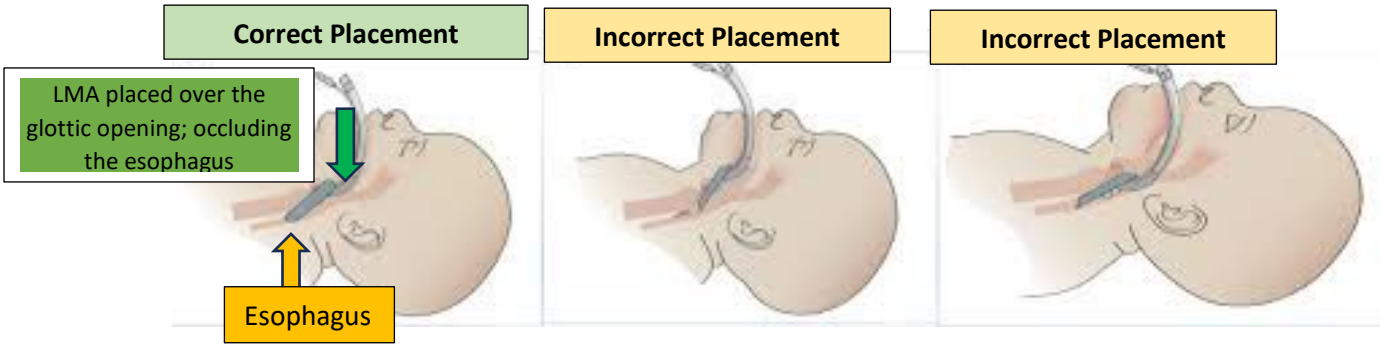
Quick Reference: Neonatal Supraglottic (LMA) Airway Placement

When to consider a supraglottic airway device?

- Newborns with congenital anomalies involving the mouth, lip, tongue, palate or mandible
- Ineffective PPV with face mask and/or unsuccessful attempts at intubation

Determining correct size and placement:

- Follow manufacturer instructions for weight, size and mask inflation volume (if applicable)
- Suggested for newborns >34 weeks and/or >2kg
- Anticipate size 1 for newborns
- Device needs to be positioned over the glottic opening to ensure effective ventilation with PPV



Conformation of correct placement and securing device:

- Confirmation of correct placement is made by establishment of effective ventilation with PPV:
  - Slight chest rise, rising heart rate, bilateral breath sounds, +CO2 detector color change
- See image below for example of securing LMA with tape

For pre-transport stabilization questions or to arrange a transport request: 1-800-UCD-4-KIDS

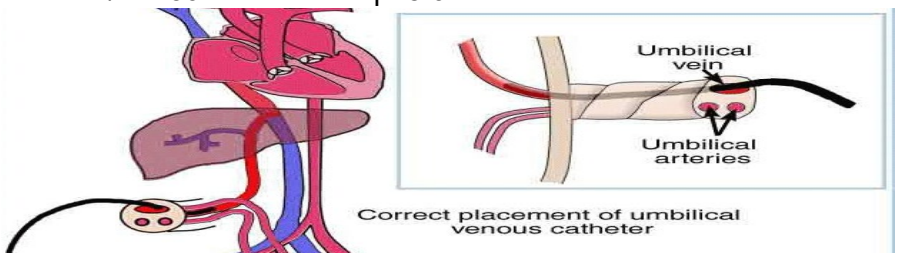
Reference:

1. Neonatal Resuscitation Program 8th Edition. American Academy of Pediatrics 2021
2. The STABLE Program: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed. 2024
3. Vali, P., Laskminrusimha, S. Laryngeal mask airway: an alternate option for all phases of neonatal resuscitation. *Pediatr Res* **92**, 626–628 (2022). https://doi.org/10.1038/s41390-021-01917-5

Quick Reference: Neonatal Vascular Access

Emergent Low-Lying UVC:

- Supplies needed: Single lumen UVC catheter, stopcock, NS flush, antiseptic, tie, scalpel, tegaderm
- **Technique: Prep** cord (with antiseptic)—**Tie** (apply umbilical tie to base of stump)—**Cut** cord (with scalpel) horizontally ~ 2cm from umbilical stump —**Cannulate** umbilical vein to 3-5 cm with normal saline primed catheter (insertion depth depends on size of patient). Refer to NRP recommendations.
- Line placement: insert primed catheter 3-5 cm (see image below), obtain blood return to confirm placement, flush with normal saline, secure catheter to skin with occlusive dressing (suture in place when able)
- Catheter size selection:
  - <1500 Grams and/or <30 weeks 3.5 F
  - >1500 Grams and/or >30 weeks attempt 5.0 F



PIV Placement

- Utilize 24 gauge catheter, attach primed T-connector, and "bi-fuse" if able

Intraosseous IO Placement

- Indication: emergent access alternative if UVC or PIV unsuccessful and/or not able to be obtained
- EZ IO if patient is ≥3kg or manual IO: follow manufacturer instructions
- Insertion site: proximal tibia and/or distal femur (follow manufacturer instructions)
- Equipment needed: IO needle, T-connector infusion set primed with NS, antiseptic, securement device
- Monitor the site for evidence of swelling or fluid extravasation
- Most medications and fluids that can be given via UVC/IV can be infused IO route. Consult with pharmacy.

Fluid Resuscitation

- Normal Saline 0.9% 10ml/kg IV over 5-10 minutes (slower if preterm)

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Reference:

1. Neonatal Resuscitation Program 8th Edition. American Academy of Pediatrics 2021
2. The STABLE Program: Postresuscitation/Pretransport Stabilization Care of Sick Infants. Guidelines for Neonatal Healthcare Providers 7th ed.
3. MC-000280Rev4_Arrow_EZIO_PocketGuide_ACTO-1-1.pdf. Arrow® EZ-IO® Education | US | Teleflex. Accessed August 2024

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