



# Welcome

## *Please remember*

- Mute upon entry and stay muted unless you are called upon to share.
- Please text any questions into the Chat Box.
- The sessions will be recorded for future viewing.



Winter Conference March 12th, 2026

# Neonatal Stabilization for Transport

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# No NICU? No problem!

Detailed Case-Based Conference Edition

# All speakers have no disclosures

# Objectives

- Preparation strategies
- Resuscitation/stabilization of infant
  - VLBW infant
  - Term infant with respiratory distress
- Golden Hour/until transport team arrives



# Case 1: Golden Hour Stabilization of the VLBW Infant

Recognition, Stabilization, and Transport

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# Detailed Case — Presentation

- Mother presents to your hospital at 27.2weeks with rupture of membranes and contractions, infant is in breech position
- You are in a level 1 birthing hospital with pediatrician coverage of deliveries from the primary care office.
- Your referral NICU center is 60 minutes driving time away\*

# Hospital Resources

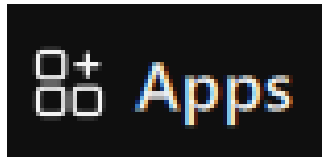
- Level I birthing center
- LRDP with small nursery and operating room for C-section deliveries
- Standard warmer set up with T-piece resuscitator



# Polling through Slido

Slido should automatically open on the Webex sidebar when the question is launched

If it does not open, click on the “Apps” button in bottom right of your screen:



Other ways to join:

- You can also join on your phone by using the QR code to the right
- Go to Slido.com and enter in the code: 3858030



# Poll #1 — Preparation Priorities

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# Preparation for VLBW infant

- Roles and responsibilities for small delivery team
- Delivery room temperature
- Cord management strategy
- Other equipment: warming mattress, polyethylene bag
- Transport call to perinatal center

# Poll #2 — Role Assignment

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# Preparation for VLBW infant

- Clear communication and determination of roles is key in high risk deliveries
  - Initial management effects immediate and long term neonatal outcomes
  - Prepared for various scenarios
  - Prepare/check equipment pertaining to role
  - Pre-delivery huddle
- Roles:
  - Head of bed/airway management
  - Respiratory support
  - Initial VS assessment/thermoregulation
  - Manage IV access
  - Parent support

# Preparation for VLBW infant (CC)

- Warmer set up for T-piece
- Mask size
- Setting for PIP/PEEP
- Oxygen FiO<sub>2</sub>
- ETT sizing
- Other?

# Delivery Occurs

- Male infant born with weak cry, intermittent respirations, poor tone, HR ~110.
- Placed on warmer in polyethylene bag and on top of chemical warming mattress.
- CPAP initiated with T-piece at +6 (30% FiO<sub>2</sub>)

# Poll #3 — Initial Respiratory

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# Nasal CPAP: Physiologic Rationale

- Distending pressure **recruits** lung volume
- Increases and stabilizes FRC
- Splints upper airways and compliant chest wall
- Improves lung compliance
- Reduces airway resistance
- Decreases work of breathing
- Improves gas exchange
- Reduces apnea

# Bubble CPAP vs Ventilator CPAP



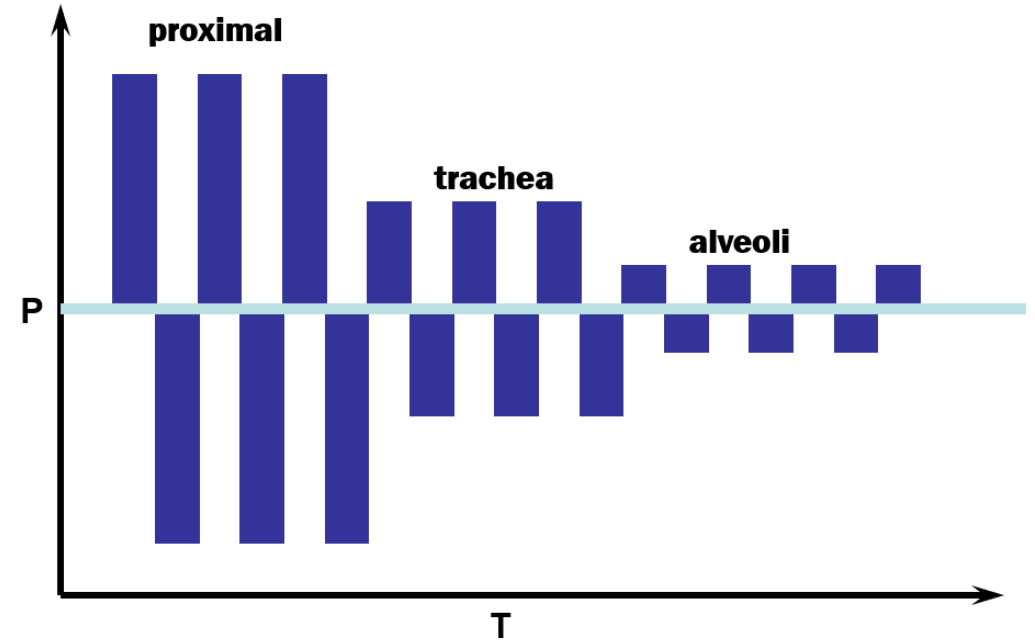
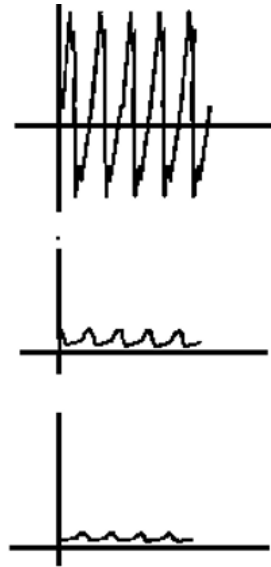
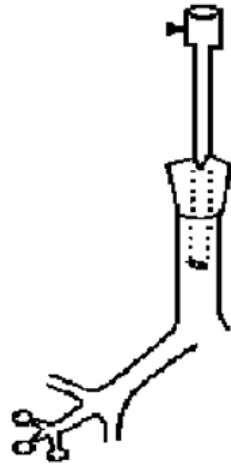
# Neonatal CPAP

- Bubble CPAP is generally better at reducing failure and shortening NICU stays—study by Bharadwaj et. al.
- The pressure oscillations from the bubbling show a decrease in respiratory rate and minute ventilation when compared to CPAP from a ventilator—study by Lee, Dunn et.al.
- Studies by Pillow and Travadi confirm that the oscillations are transmitted into the airway and lungs



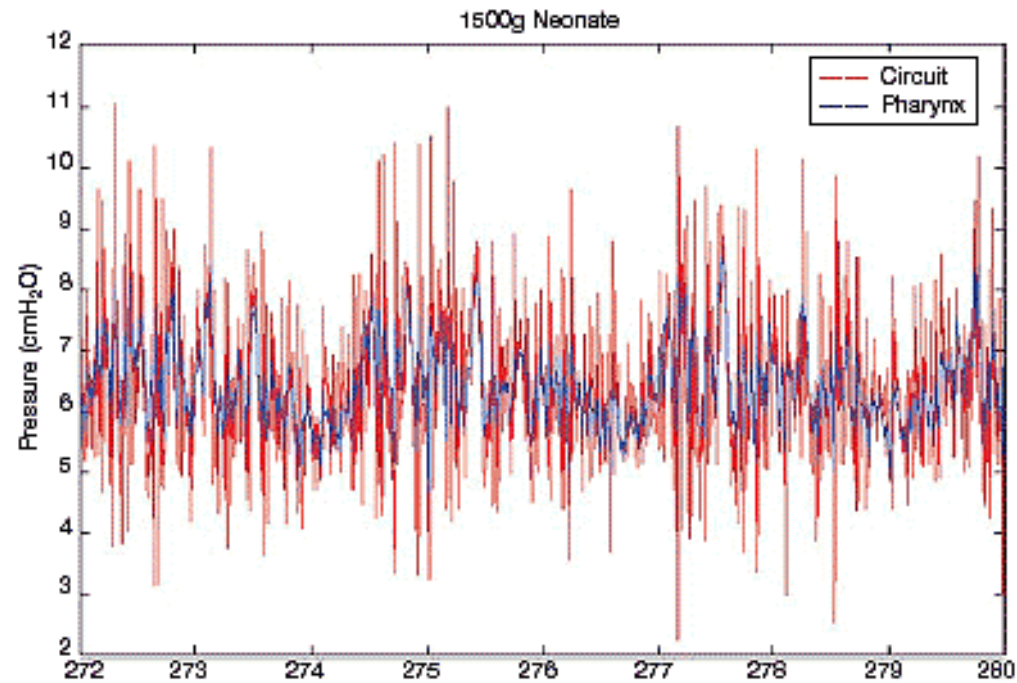
# Neonatal CPAP

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# Neonatal CPAP

*Measurements from a 1500g neonate (2001)\**



*Note: Pressure oscillations are present at both the airway opening and pharynx.*

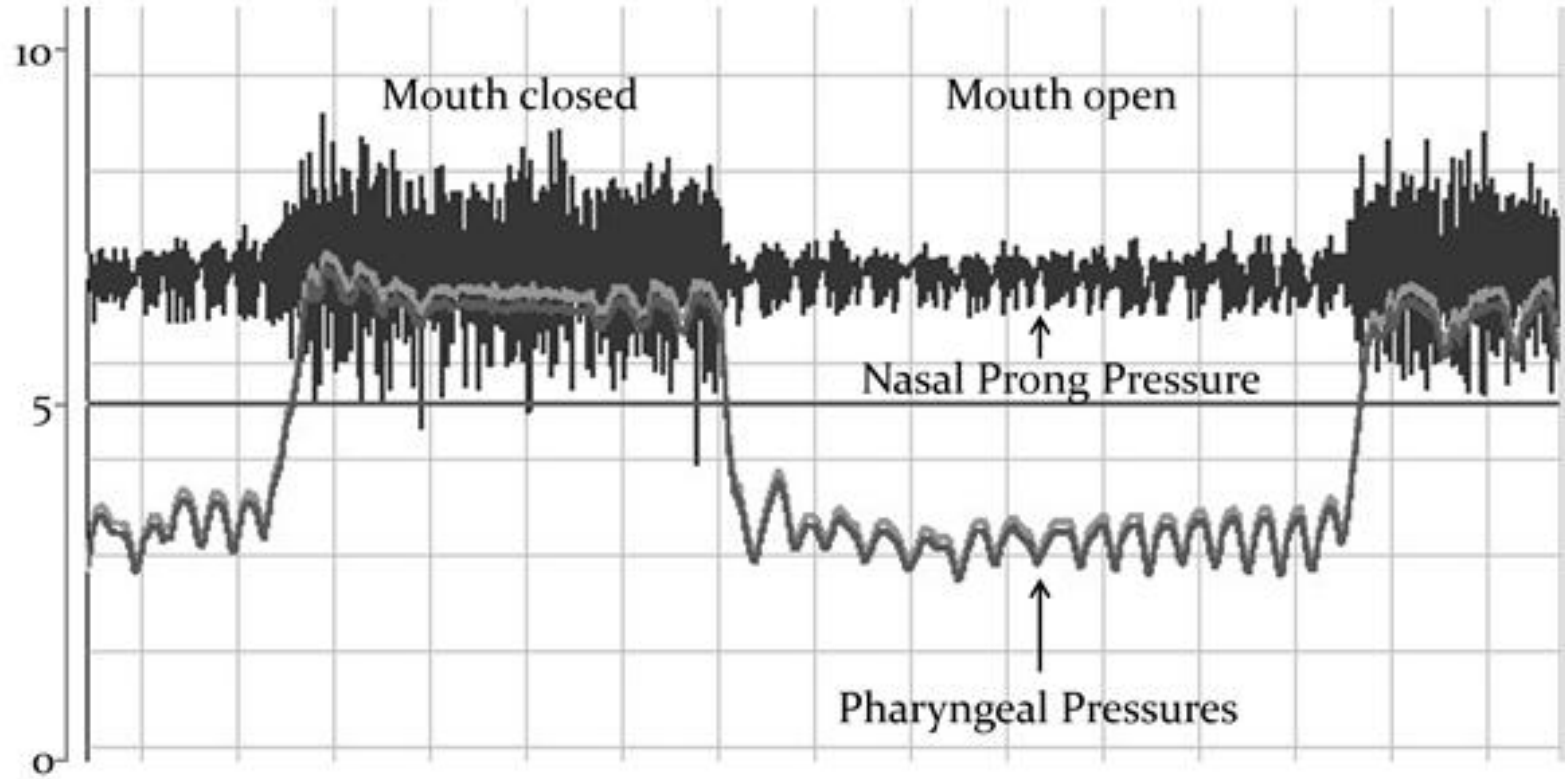
# Neonatal CPAP

## Keep the mouth closed

- Chinstraps
  - Used to keep mouth closed for increased pharyngeal pressure
  - Pharyngeal pressure falls significantly if the mouth is open even slightly



# Neonatal CPAP



# Clinical Course 5 min

Tachypneic respirations on CPAP +5 (30%), HR 130-140's,  
oxygen saturations 75%



# Poll #4 — Escalation Decision

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# Neonatal Intubation Indications

## O<sub>2</sub> Need Thresholds:

- $\text{FiO}_2 > 0.30\text{--}0.40$  on CPAP predicts CPAP failure → intubation.
- $\text{FiO}_2 \times \text{PEEP} > 1.50$  strongly predicts CPAP failure.
- Failure to reach NRP 2025 SpO<sub>2</sub> targets despite CPAP.

## Work of Breathing Indicators:

- Persistent labored breathing or cyanosis despite CPAP.
- Gasping, apnea, or ineffective ventilation requiring airway control.

# Neonatal Intubation Indications

## Transport Timing:

- Inability to maintain oxygenation on CPAP/NIPPV → intubate before transport.
- $\text{FiO}_2 \geq 0.40$  often indicates need for invasive ventilation prior to transfer.

## Combined Factors:

- Acidosis or worsening respiratory failure despite NIV.
- Predictors of CPAP failure: Low Apgar,  $\text{FiO}_2 > 0.30$ ,  $\text{FiO}_2 \times \text{PEEP} > 1.50$ .
- Indications for surfactant therapy

# Does this infant need IV access?

- PIV vs. UVC
- Rate of initial glucose infusion?
- Other bloodwork needed for this infant?

# IV access for VLBW infant

- Goal: Prevent hypoglycemia
  - UVC Placement
    - Low Lying: provides quick access, utilize for lab draws
    - Central: good option, takes longer, utilize for lab draws
      - Can always replace LL for central after stabilization
  - PIV
    - Also good, possibly quick access
    - Painful procedure
    - Increased handling
    - Limit attempts
    - No labs
  - IV Fluids: Where to start?
    - 80-100 mL/kg/day of D10W
      - GIR 5.5-6.9 mg/kg/min
      - Increased TF: IWL

# Labs for the VLBW Infant

- POC glucose
  - Prevent hypoglycemia!
    - Monitor closely
- Blood Gas
  - VBG if UVC placed
  - Help determine if escalation of respiratory support is needed
- Blood Culture/CBC
  - Assess for potential risk factors for infection
- CXR

# Specific VLBW Considerations

- Thermoregulation
  - Hypothermia: < 36.5 C
    - Conduction, Convection, Radiation, Evaporation
    - Minimal brown fat metabolism/vasoconstriction
    - Prewarm DR, prewarm RW, thermal mattress, hat, polyethene wrap, RW servo mode
- Head midline
  - Prevent IVH
    - Avoid obstruction of venous drainage
    - Avoid rapid BP changes
    - Avoid rapid IV infusion
- Minimal handling
  - Gently when necessary
  - Reduce trauma
  - Decreased noise
  - No Trendelenburg

# Transport Call Update

- Infant now stable on CPAP +6 (40%)
- Temperature 36.6 degrees C
- PIV in place with dextrose infusing at ~70ml/kg/d
- Initial arterial blood gas 7.27/58.
- Blood culture obtained, glucose 55 mg%.
- Transport team just about to arrive.



# Transport team

- First steps as transport APP?
- First steps as transport RT?
- To intubate or not to intubate, that is the question....

# Learning points/discussion

- Preparation for delivery
- Initial steps in resuscitation- specific for VLBW infant
- Respiratory considerations for VLBW infant, incorporating new NRP guidelines
- Golden hour before transport team arrives

# **Case 2: Term Infant with Respiratory Distress**

Recognition, Stabilization, and Transport

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# Case Presentation

- Mother presents to your hospital at 39.2weeks with rupture of membranes and contractions, infant is in breech position
- You are in a level 1 birthing hospital with pediatrician coverage of deliveries from the primary care office.
- Your referral NICU center is 60 minutes driving time away\*

# Case Presentation

- Uncomplicated pregnancy
- Spontaneous vaginal delivery
- Apgars 8 and 9
- At 20 minutes develops respiratory distress

# Poll #1 Recognition

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# Case Presentation

- At ~30 minutes of age, following initiation of CPAP, infant's saturations are now 85% on CPAP +5 (40%)
- HR in the 150's
- Increased work of breathing
- Asymmetric chest rise on physical exam with diminished breath sounds on the right

# Poll #2 Immediate Action

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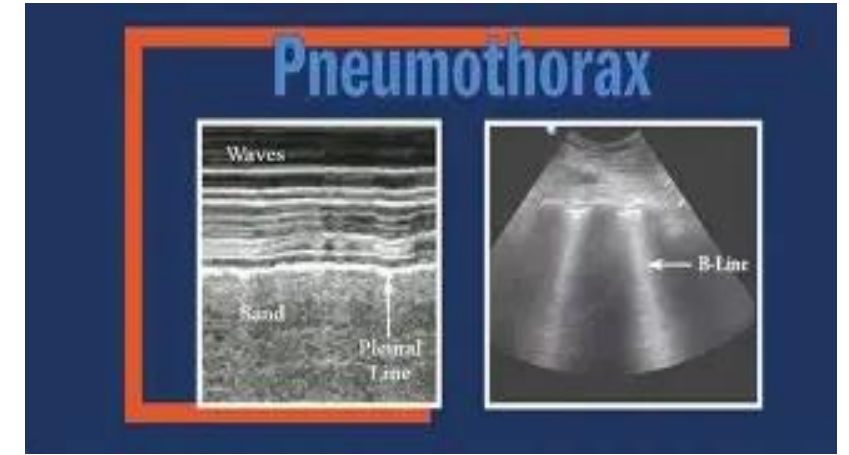
# Transillumination

- Noninvasive RAPID bedside diagnostic tool
  - Place transilluminator on anterior chest wall, or along posterior axillary line
  - Positive: ~1cm ring of light around transilluminator (or larger!)
  - Always check both sides of chest



<https://www.amandasnicuconsulting.com/>

# Identifying the Pneumo!!



# Poll #3 Rapid Diagnosis

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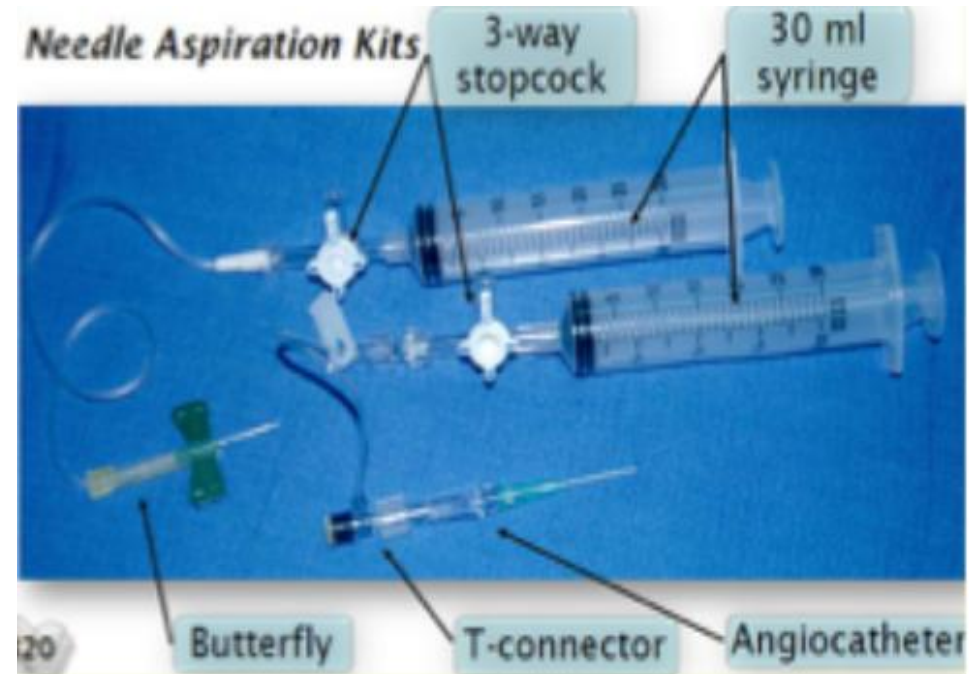
# Case Presentation

- Worsening respiratory distress over next 20 minutes
- CXR as seen
- Perfusion appears to be worsening



# Needle decompression

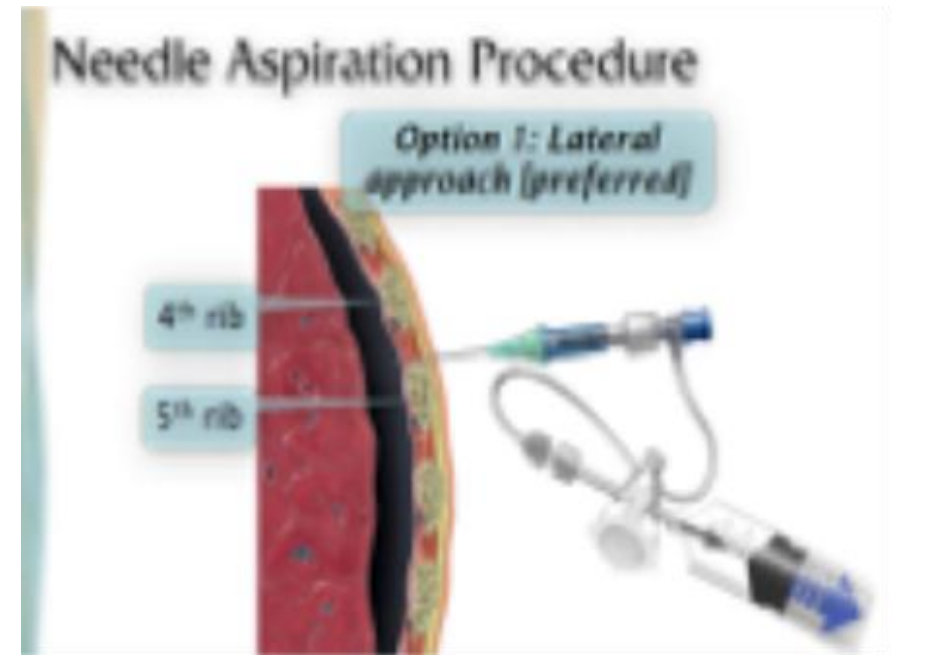
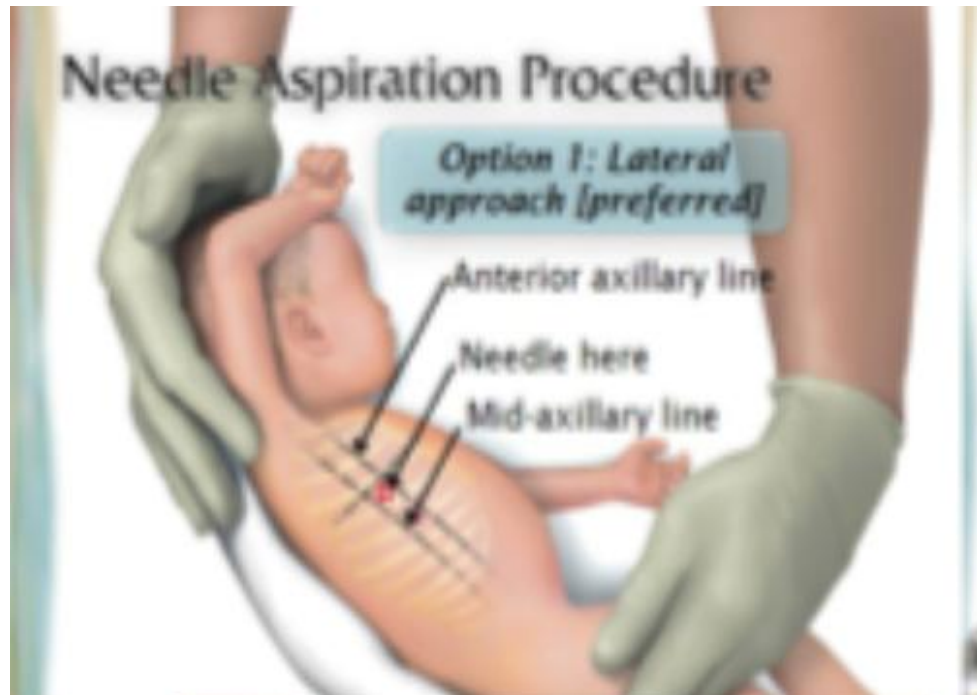
- Equipment for needle decompression
- Positioning of infant



# Poll #4 Needle Location

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# Needle location



# Case presentation

- Needle decompression performed with removal of 45cc of air from right chest
- Improved oxygenation (saturations now 93%)
- Improved perfusion
- Respiratory considerations post-needle decompression (intubation, CPAP, minimal support)?



# Post-Decompression

Improved oxygenation

Improved perfusion

Prepare chest tube

# Poll #5 Chest Tube

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# Case presentation

- Infant continues on CPAP +6 (30%) with saturations 95%.
- Still tachypneic
- Transport team arrives

# Case Presentation

- First steps as transport APP?
- First steps as transport RT?
- To place a chest tube or no chest tube, that is the question....

# To Treat or NOT to Treat

Severity	Best Support	
Mild/Stable	Low-flow oxygen, avoid pressure	If necessary, Nitrogen washout may deliver to much O2 with minimal effect
Moderate/Severe Distress	Chest decompression (needle or tube) first; then gentle support	Key intervention
If ventilation unavoidable	Gentle mechanical ventilation with minimal pressures	Volume targeted
CPAP?	Avoid — increases risk and severity	

# Key takeaways

- Initial steps in newborn respiratory distress
  - Diagnostic
  - Therapeutic
- Responding to worsening respiratory distress of newborn
- Steps in performing needle decompression
- Chest tube placement considerations

# Thank you!

Questions?

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## Contact the speakers:



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