**Scenario**
- Pregnant mother in labor and en route to ER
  - Delivery is imminent

**Approach**

**Multidisciplinary team approach** – ER, OB and NICU teams. Timely notification of other teams is key. Know your setting in terms of resources, pediatric tertiary care centers, distances and mode of transport available if needed.

**Initial Questions – Allows team to prepare appropriately**
- One baby or multiple so as to decide on number of personnel needed for stabilization.
- Term or preterm, equipment chosen will vary depending on gestational age (GA)
- Relevant maternal serology
- Rupture of membranes? If yes, is fluid clear, bloody or meconium stained.

**Key difference in NRP**: Ventilation is key. Still follows airway (A), breathing (B), circulation (C) sequence compared to C-A-B sequence in PALS and ACLS.

**IMPORTANT STEPS – Prepare for the worst case scenario**

1. **Initial Stabilization** – Thermoregulation
   - Warmer which is turned ON (Normal temperature is 36.5 to 37.5°C)
   - Warm towels and hat (Neonates have high surface area and lose heat rapidly)
   - Neowrap (for <32 week GA)
   - Transwarmer

2. **Airway** – Open airway and Clear secretions
   - Shoulder roll to open up airway and maintain sniffing position
   - 8 – 10 Fr Suction catheter set to 80 to 100 mm Hg negative pressure
   - Bulb suction

3. **Breathing** – Provide ventilatory support
   - Self-inflating bag or T piece resuscitator, set at PEEP of 5 and Peak inspiratory pressure of 20 cms of H₂O, adjust flow rate to 10 LPM.
   - Mask ( Appropriately sized to cover mouth and nose)
   - Set FiO₂, 21% for ≥ 35 week and 21 - 30% for <35 week
   - Orogastric tube to decompress abdomen
   - Endotracheal tube – 2.5, 3.0, 3.5 size
   - Blade – Miller 00, 0 or 1
   - CO₂ detector
   - Pulse ox probe (Applied to right wrist for preductal saturations)
   - EKG leads

4. **Circulation** – Hemodynamic support
   - Umbilical venous catheter – 3.5 or 5 Fr
   - Insertion kit – cord tie, scalpel, forceps
   - Epinephrine (1:10000 concentration)
   - Normal saline

5. **Miscellaneous**
   - Pre resuscitation briefing
   - Assign roles to team members
   - Team Include – Leader, Respiratory therapist, Auscultator (HR and breath sounds), Compressor, Line insertor, Meds, Recorder
   - Closed Loop Communication
Once Baby is delivered, initial questions to be asked

- Appears Term/Preterm
- Respiratory effort – Crying/gasping/none
- Tone – Flexor (good) / extensor (bad)

Ventilation is **KEY**. Airway – Breathing – Circulation sequence

**Objective measure of success of resuscitation - Heart Rate**

**Heart Rate targets**
- $\geq 100$ bpm - Resuscitation going well
- $60 \leq$ and $< 100$ bpm – needs positive pressure ventilation
- $< 60$ bpm – Needs Chest compressions in addition

**Time intervals for monitoring Heart rate**
- Every 30 seconds
- Extends to 60 seconds when chest compressions ensue

**Targets for Oxygen Saturation (Preductal)**
- 60% within the 1st minute of life
- Takes around 10 minutes to reach 90 – 95% sats

**Corrective measures for improving ventilation**
- **M** Adjust Mask to cover mouth and nose
- **R** Reposition airway
- **S** Suction mouth then nose
- **O** Open mouth
- **P** Pressure increase
- **A** Alternate Airway

If HR < 60 bpm, Compressions start
- Compressions and breaths coordinated at 3:1 ratio

**Intravenous access – Umbilical venous catheter**
- Think about placement once compressions started
- Clean and not sterile procedure
- Insert catheter till blood return obtained (around 4-5cm)
- Drugs given – Epinephrine, normal saline and dextrose
- Dose of epinephrine – 0.1 ml/kg for IV and 1ml/kg via endotracheal route.

**Debrief**
- VERY IMPORTANT, only way to get feedback and improve.

**References:**

6. Cincinnati Children’s Hospital UVC Placement on Sim Newbie

(Contact: steve@embasic.org)
Thermoregulation

- ETT – sizes used 2.5, 3.0 and 3.5
  - 23 weeks to < 30 weeks – 2.5 size ETT
  - 30 weeks to < 35 weeks – 3.0 ETT (when in doubt use 3.0)
  - 35 weeks and beyond – 3.5 ETT

- Blade size – sizes used are 00, 0, 1 Miller
  - 25 weeks and below: 00
  - 26 – 34 weeks: 0 (when in doubt use 0 blade)
  - 35 and above: 1

Endotracheal tube and Blade size

<table>
<thead>
<tr>
<th>Time</th>
<th>Target Oxygen Saturations</th>
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<tbody>
<tr>
<td>1 min</td>
<td>60%-65%</td>
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<tr>
<td>2 min</td>
<td>65%-70%</td>
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<tr>
<td>3 min</td>
<td>70%-75%</td>
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<tr>
<td>4 min</td>
<td>75%-80%</td>
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<tr>
<td>5 min</td>
<td>80%-85%</td>
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<tr>
<td>10 min</td>
<td>85%-95%</td>
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Sniffing Position