**EM Basic - Neonatal Resuscitation Program (NRP)**

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**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 37.5⁰C)
* Warm towels and hat (Neonates have high surface area and lose heat rapidly)
* Neowrap (for <32 week GA)
* Transwarmer
1. **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
1. **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
1. **Circulation** – Hemodynamic support
* Umbilical venous catheter – 3.5 or 5 Fr
* Insertion kit – cord tie, scalpel, forceps
* Epinephrine (1:10000 concentration)
* Normal saline
1. **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**

* ≥ 100 bpm - Resuscitation going well
* ≥60 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 **M**ask to cover mouth and nose
* **R R**eposition airway
* **S S**uction mouth then nose
* **O O**pen mouth
* **P P**ressure increase
* **A** Alternate **A**irway

**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.

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**Thermoregulation**



**Sniffing Position**

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**Endotracheal tube and Blade size**



**Target Oxygen Saturations**