

NEONATAL RESUSCITATION PROGRAMME



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Importance

- Bradycardia in a asphyxiated newborn is mainly due to lack of oxygen so Oxygen is important.
- before birth fetus receives oxygenated blood from placenta but after birth cord is cut which stops the delivery of oxygen
- If baby doesn't start breathing immediately after birth may die due to lack of oxygen so proper resuscitation helps normal breathing
- Approximately 10% of newborns require some assistance to begin breathing at birth
- Less than 1% require extensive resuscitation measures, such as cardiac compressions and medications

Anticipation of resuscitation need

Assessment of perinatal risk

- Gestational Age
- Amniotic Fluid
- Number of Babies
- Additional Risk Factors
- At least 1 person who can perform all steps of resuscitation. Need of helper increases in every further complication
- Its effective teamwork and communication approach
- Pre-resuscitation briefing with team leader and teammates is must.

Preparation of equipment.

Thermal control	Radiant warmer, 2-3 prewarmed linen and plastic wrap for preterm
Airway patency	Shoulder roll, mucus aspirator or suction catheter, suction machine.
oxygenation	Oxygen source, flow meter/tubing, oxygen blender, pulse oxymeter.
For PPV	Self inflating bag, reservoir, facemask, oxygen

Golden minute

- Emphasis is placed on the initial 60 seconds
Completing initial steps ,Evaluation Beginning ventilation (if required)
- Important to avoid unnecessary delay in initiation of ventilation, since this is **THE MOST IMPORTANT** step for successful resuscitation of the newborn that has not responded to the initial steps.
- The decision to progress beyond the initial steps is based on a simultaneous assessment of 2 vital characteristics:
- Respirations (apnea, gasping, or labored or unlabored breathing) Heart rate (less than 100/min)

How to begin

After entering into the labour room

- Hand wash
- Say hello to obstetrician and ask
 - ✓ gestation is term or not,
 - ✓ h/o bleeding pv,
 - ✓ h/o fetal distress
 - ✓ indication of lscs.
- Check availability and working condition of equipment
- Identify helper.

Assessing the need of resuscitation at birth

- Note the time of birth
- Receive baby in dry warm linen
- Is baby breathing ? Or cry ?
- If yes provide routine care
- If no then proceed for further resuscitation procedures.

Routine care

- Dry the baby on mother's abdomen.
- Provide warmth by skin to skin contact.
- Breathing and warmth go together. Breathing should be assessed while drying the baby.
- Cut cord in 1-2 minutes (delayed cord clamping results in healthier blood and iron levels).
- On going evaluation of neonate interms of HR & RESPIRATION

Baby is not cried.

Provide **INITIAL STEPS**

- Cut the cord immediately and placed under radiant warmer.
- Dry the baby
- Position the baby
- Clear the airway
- Stimulate the baby (gentle rub on back /tap on the sole 2times).
- Evaluate HR & RESPIRATION after 30sec of initial steps.

HR > 100 but laboured breathing

- After initial steps – baby's HR is >100 but has laboured breathing or apnea.
- baby needs additional oxygen support specially preterm with CPAP or free flow oxygen (oxygen mask, flow inflating bag and mask, oxygen tubing and T-piece resuscitator).
- Shift the baby to NICU further observation.
- Keep monitoring saturation level.

HR<100 with no breathing

- Provide **POSITIVE PRESSURE VENTILATION**
- Equipments for PPV-
- Self inflating bag
- Resuscitation masks
- Assembling and testing the equipments.
- Start ventilating the baby- breath 2 3.....breath 2 3 at the rate of 40bpm
- After 5 SQUEEZE check adequate chest raising.



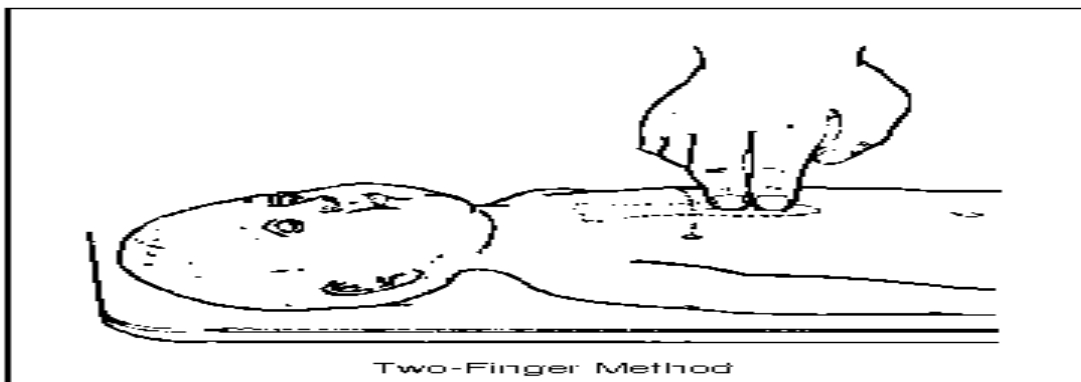
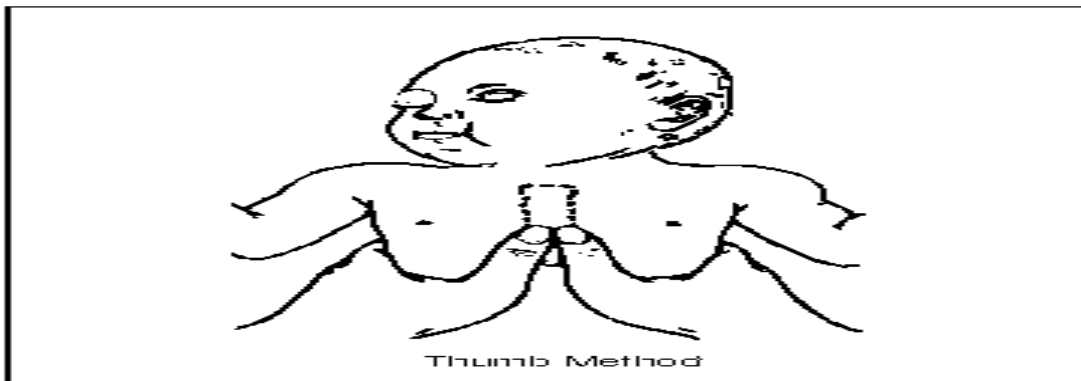
	PROBLEM	REMEDIAL STEPS
M	INADEQUATE SEAL	MASK ADJUSTMENT
R	INADEQUATE POSITION	REPOSITION THE HEAD
SO	BLOCKED AIRWAYS	SUCTION THE AIRWAYS. OPEN BABY’S MOUTH
P	INADEQUATE PRESSURE	INCREASE PRESSURE
A	NO IMPROVEMENT WITH ABOVE STEPS	CONSIDER ENDOTRACHEAL INTUBATION

- After 30sec of bag and mask ventilation reassess HR & RESPIRATORY effort.

Problem	Remedial steps
HR > 100	STOP ventilation if spontaneous respirations. If gasping or not breathing continue ventilation
60 to 100	Continue bag and mask ventilation and reassess after 30sec

Chest compressions

- Chest compressions are used to increase circulation and oxygen delivery temporarily.
- **WHEN**- despite 30sec of effective PPV with 100% oxygen still HR<60bpm
- **HOW**- Compress the heart between sternum and spine and depth of compression should be one third of the AP diameter of the CHEST
- Chest compression must always accompanied by ventilation. For every 3 compressions 1 breath is delivered.in a minute 90compressions and 30 breaths. 1 AND 2 AND 3 AND BREATH AND
- Two THUMB technique is preferred.



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WHEN TO DISCONTINUE

HR > 60 bpm
But PPV has to be continued till baby HR > 100 and baby begins to breathe.
Shift the baby to the NICU for the post resuscitation care.

If baby not improving

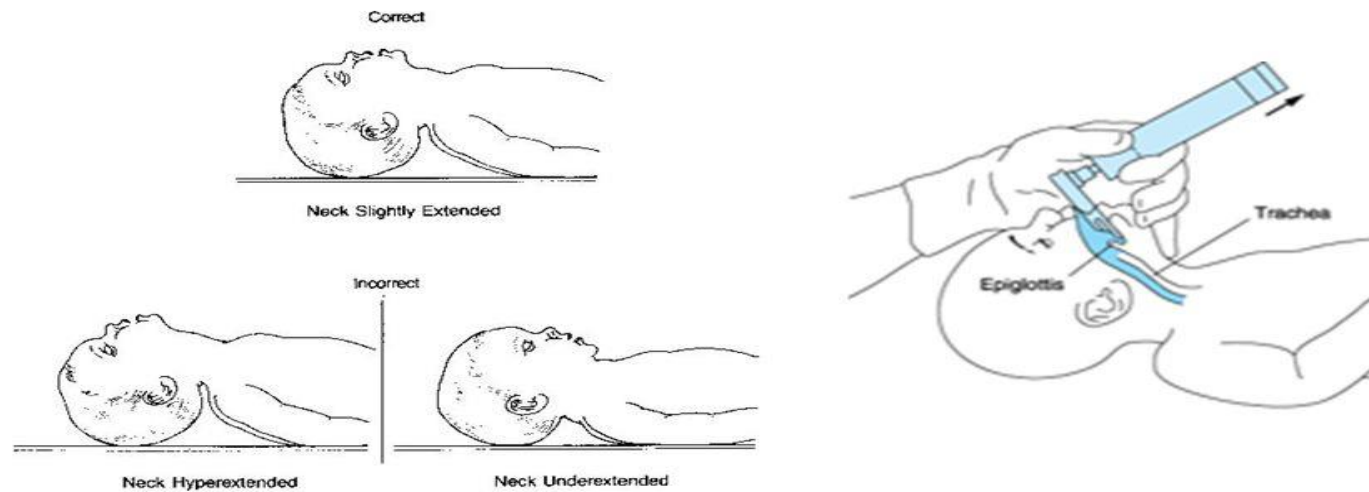
When HR < 60 bpm with no respiratory effort.

- > Check PPV is effective.
- > Baby has to be intubated.
- > Make sure 100% oxygen going.
- > Check the depth of compression.
- > Ensure chest compression and ventilation are well synchronised.
- > Insert umbilical catheter if HR remains below 60 bpm to provide medications.

Endotracheal intubation

- Indication –
 - ✓ ineffective PPV not resulting in clinical improvement (if HR not increasing),
 - ✓ PPV required for more than a few minutes,
 - ✓ suspected diaphragmatic hernia.
- Equipments – laryngoscope, Blades(term-1,preterm-0),endotracheal tube with inner dm of 2.5,3,3.5 & 4mm,suction machine and catheter 10f size,stethoscope,PPV device oxygen source and other miscellaneous.
- procedure

Neonatal Resuscitation-Intubation



Only experience and well practiced clinicians should attempt to intubate

Correct placement of ET Tube

- Correct placement of the ET is indicated by
 - ✓ Improved vital signs
 - ✓ Equal breath sounds over both axillary lung fields.
 - ✓ Vapour in the tube during exhalation
 - ✓ Chest movement with each breath
 - ✓ Radiological confirmation

Medications

- If HR < 60b/min despite adequate ventilation with 100% oxygen (preferably through an endotracheal tube) and chest compressions, then administration of epinephrine or volume expanders or both indicated.
- All medications and fluids should be infused through IV/umbilical route access
- ADRENALINE (1:10000 dilution)
The recommended dose for IV administration is 0.1-0.3ml mg/kg per dose (preferred route) and for ET administration is 0.5-1ml/kg per dose

VOLUME EXPANDERS

- should be considered when blood loss is known or suspected (pale skin, poor perfusion, weak pulse) and the infant's heart rate has not responded adequately to other resuscitative measures
- Normal saline 10ml/kg. (can be repeated)
- Ringer lactate not preferred now.

Post resuscitation care

POST-RESUCITATION CARE

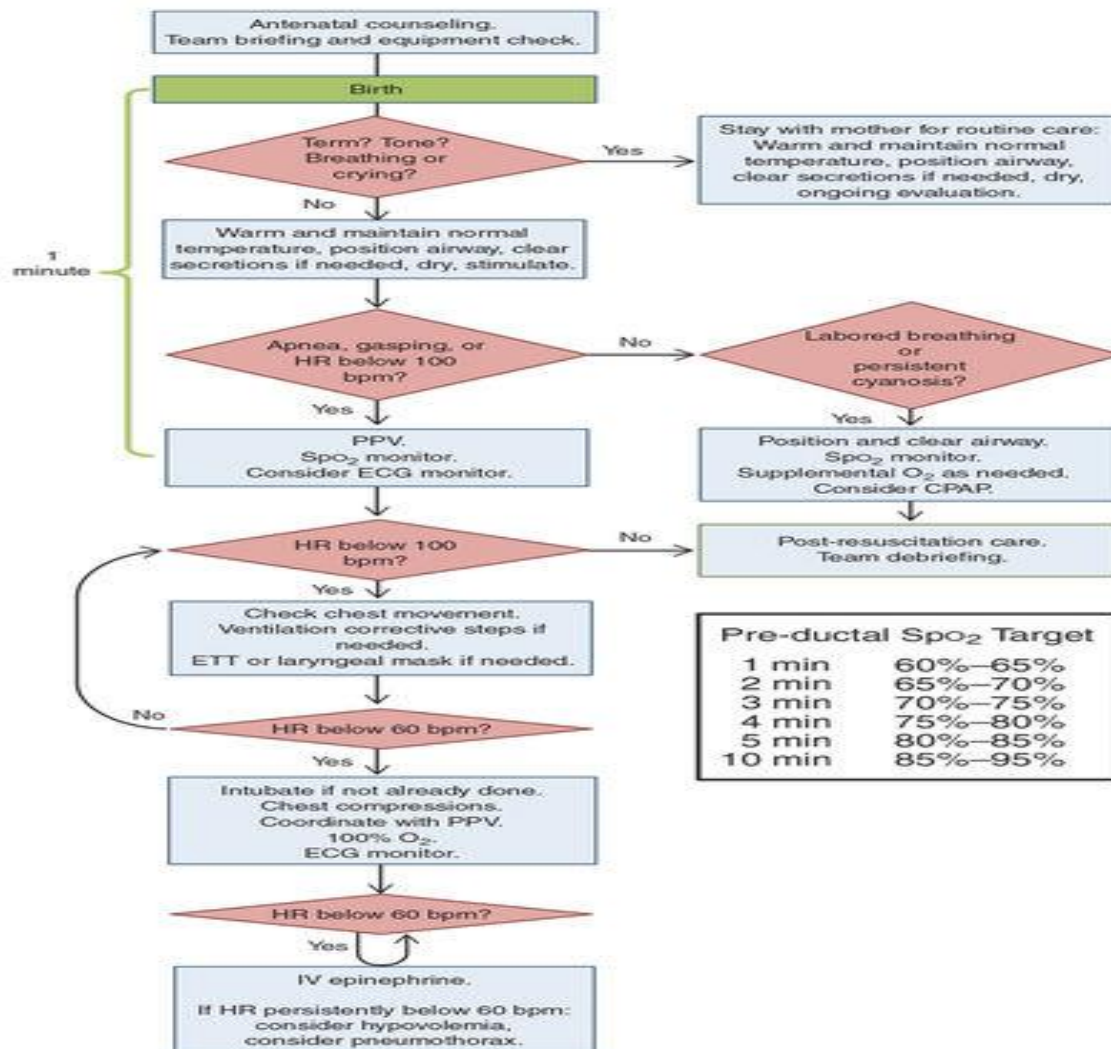
- baby who require resuscitation are at risk of deterioration after their HR & RESPIRATION have returned to normal
- Once effective ventilation and/or the circulation has been established, the baby should be maintained or transferred to an environment where close monitoring and anticipatory care can be provided.
- Close monitoring of HR, RESPIRATION & SPO₂

WHEN to Discontinue

- If baby remains compromised despite of effective resuscitation efforts you may consider airway malformation ,pneumothorax, diaphragmatic hernia or any other congenital structural diseases of lungs and heart.
- An Apgar score of 0 at 10 minutes through the resuscitation is a strong predictor of mortality.
- Baby with an Apgar score of 0 after 10 minutes of resuscitation, if the heart rate remains undetectable, it may be reasonable to stop assisted ventilation
- The decision to continue or discontinue resuscitative efforts must be individualized



Foundations of Neonatal Resuscitation



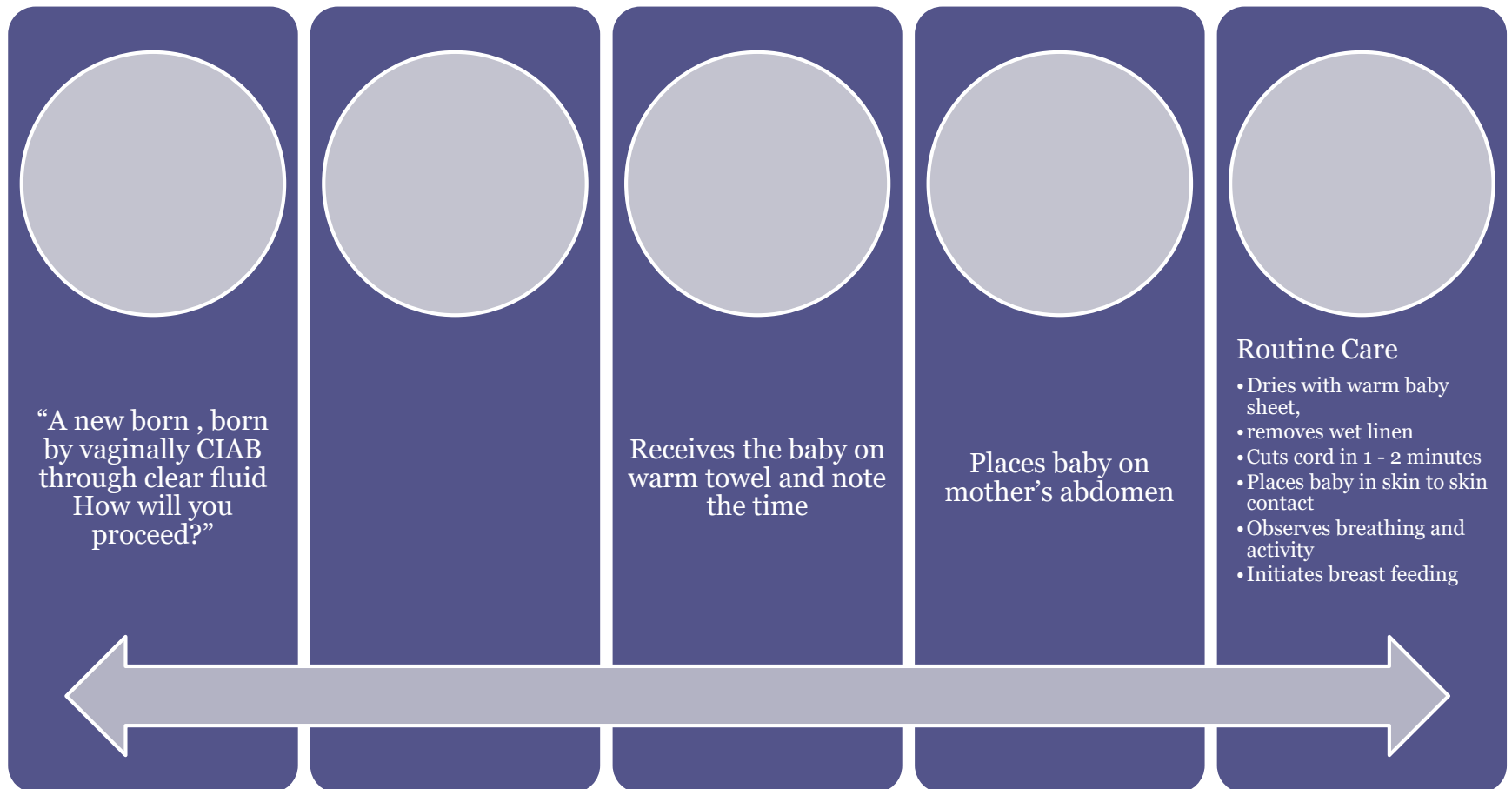
NRP 2017 GUIDELINE CHANGES

- Begin Resuscitation with antenatal counselling (when appropriate) and a team
 - Post resuscitation therapeutic hypothermia in resource limited settings.
 - Maintain euglycemic state of baby because it has good outcome on central nervous system
 - Administration of oxygen to preterm new born.
 - Assessment of HR using 3 lead ECG.
 - Ensure ventilation that inflates and moves the chest.
 - Recommendation to intubate prior to beginning of chest compressions
 - Initial steps should be followed as PDPSS (before it was PPSDS)
 - Delayed cord clamping in term & preterm who don't require resuscitation.
 - Baby born through MSL- "INTUBATION & TRACHEAL SUCTIONING "is no more indicated.
 - IVF RL is no more recommended as a volume expanders.
 - preferred route for volume expander is umbilical vein.
 - No evidence to use sod bi carbonate to correct metabolic acidosis
 - Use of NALEXONE is not encouraged.

Case-1

A new born , born by vaginally,
through clear amniotic fluid, CIAB
How will you proceed?”

Case scenarios-1

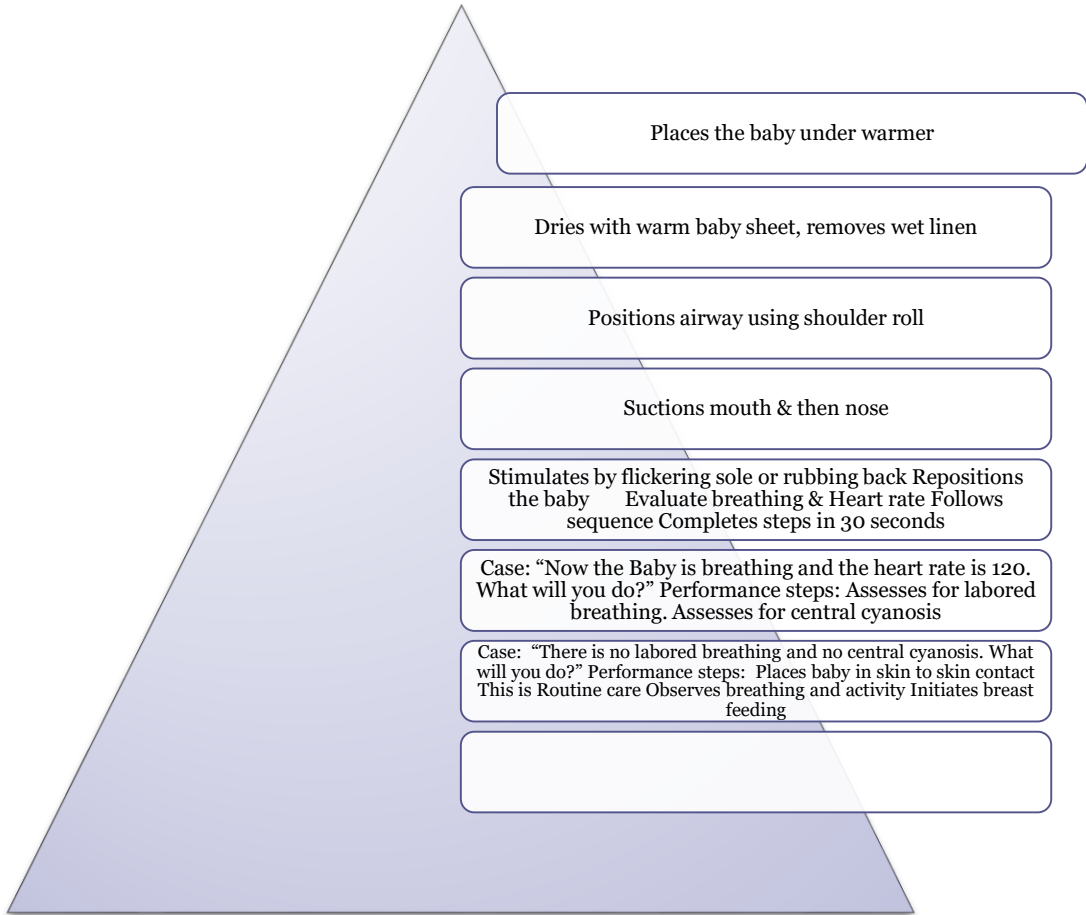


Case -2



Case: “If the same baby is not breathing/ NCIAB. What will you do?”

How will you proceed further?



CASE-3

“A post term new born baby is delivered vaginally through meconium stained amniotic fluid. How will you proceed?”

Assess the baby is vigorous or not
- 1. Strong breathing efforts 2. HR > 100 bpm 3.
Good muscle tone

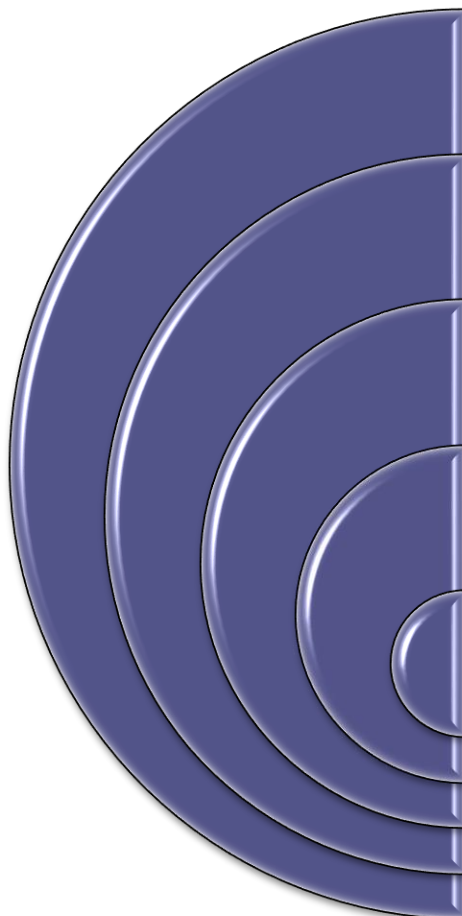
YES- ROUTINE CARE > Places baby on
mother's abdomen Dries with warm baby
sheet, removes wet linen Places baby in skin
to skin contact with mother Cuts cord in 1 -2
minutes Observes breathing and activity
Initiates breast feeding

Case Scenario 2b – NON VIGOROUS

Cuts cord immediately Places baby under
radiant warmer Dries with warm baby sheet,
removes wet linen .if required Intubate
appropriately Uses meconium aspirator
Applies suction only while withdrawing ET
tube Repeats ET suction till clear, stimulates by
flickering sole or rubbing back Repositions the

CASE-3

Non progress labour with fetal bradycardia. LSCS done, Baby is born limp. After effective initial steps baby is still gasping and the heart rate is 80 bpm.”



Performance steps: Selects appropriate sized mask, Apply it correctly .Starts PPV with room air Calls for additional help After 5 breaths, evaluates HR
Case: “Heart Rate after 5 inflations is 90 bpm and chest rise is adequate” Performance steps: Continue PPV saying “squeeze two Three...” (40-60 /min) Assesses breathing and HR after 30 seconds
Case: “Baby is breathing well and the Heart rate is 120 bpm” Performance steps: Stop PPV Places baby in skin to skin contact on mother Monitors breathing, Heart rate, colour, temperature Initiates breast feeds



Case Scenario 3b: “If the same baby had a heart rate of 40 bpm after initial 5 PPV breaths” Performance steps: checks for chest rise

Case: “There is no chest rise” –MR SOPA and After corrective measures administers effective PPV for 30 sec Assess breathing and heart rate

Case: “Baby is breathing well and the Heart rate is 120 bpm” Stop PPV Places baby in skin to skin contact on mother(if PPV<1min) Monitors breathing, Heart rate, colour, temperature Initiates breast feeding .

If PPV >1min- shift the baby to the NICU for resuscitation care





Case-3d

Even after effective PPV with 100% oxygen and chest compression failed to rise HR > 60bpm

Consider medication and volume expanders.

Can be repeated **ADREALINE** and **NORMAL SALINE**.

TAKE HOME MESSAGE

- All pediatrician who attend the labour call must be skilled at resuscitation and how to recognise baby at risk. The must
- Anticipate
- Be prepared
- Be gentle and fast
- In what order
- Team approach with one heading.
- Documentation
- Maintain hygiene.

THANK YOU





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For a Cure