Neonatal resuscitation

Fb/Nurse-Info

Neonatal Resuscitation?

- **Series of actions, used to assist newborn babies who have difficulty with making the physiological 'transition' from the intrauterine to extrauterine life**

RESUSCITATION EQUIPMENTS

- General: Resuscitation bed, over head warmer (servo-controlled infrared heater), towel, stethoscope, pulse oximeter

- Airway Mangement: Suction device with Suction catheter ; Bulb syringe, laryngoscope with blades (size 00 and 0); ETT (size 2.5, 3.0, 3.5); EtCO2 detector; LMA (size 1)

- **Breathing support: Facemask; PPV device, O2 gas, feeding tube,**

- **Circulation support: UVC kit, iv kit, io needle,**

- **Drug and fluids: Adrenaline(1;10000/0.1mg/ml), NS, Blood**

("the Golden Minute")

- ≈60 sec for initial steps, reevaluating, and beginning ventilation if required.
- The decision to progress beyond initial steps is determined by simultaneous assessment of:
  - Respirations (apnea, gasping, or labored or unlabored breathing)
  - HR (whether < 100/min or > 100/min)

- HR is assessed by intermittently auscultating the precordial pulse.

- When pulse detectable, umbilical pulse palpation provide rapid estimate and is more accurate than other sites.

Initial Assessment: APGAR score

- **Assesses neonatal well-being & resuscitation.**

1-min score ➡ Acidosis and Survival

5-minute score ➡ Neurologic outcome.

- **Each variable must be evaluated at 1 and 5 minutes.**

The Apgar score rates:

Respiration, crying

Reflexes, irritability

Pulse, heart rate

Skin color of body and extremities

Muscle tone

Virginia Apgar

APGAR SCORE

Sign	0	1	2
Color (Appearance)	Blue Pale	Body pink , Extremities blue	Completely pink
Heart Rate (Pulse)	Absent	< 100/min	> 100/min
Reflex Irritability (Grimace)	Absent	Grimace	Cough , sneeze
Muscle Tone (Activity)	None	Some flexion of extremities	Active movement
(Respiratory Effort)	Absent	Slow ,	Good , crying

APGAR Score 8-10

- Achieved by 90% of neonates
- Nothing is required, except

-nasal and oral suctioning

-drying of the skin

-maintenance of normal body temperature.

APGAR Score 5-7

- **Suffered mild asphyxia just before birth.**
  - **-Respond to vigorous stimulation**
  - **-Oxygen blown over the face.**

Apgar Score 3-4

- **These Neonates are moderately depressed at birth.**
- **They are usually cyanotic and have poor respiratory efforts.**
- **But they usually respond to BMV, breath, and become pink.**

Apgar Score 0-2

- **These neonates severely asphyxiated and require immediate resuscitation**


CHEST COMPRESSIONS & BAGGING

Which babies need resuscitation?

Newborn rapidly assessed for

- Term gestation?
- Crying or Breathing?
- Good muscle tone?

If "yes," for all 3 questions

Baby does not need resuscitation and should not be separated from mother.

If ‘NO’any of the following step is required.

1. Initial steps in stabilization
2. ABCDE steps

INITIAL STEPS

- To provide warmth by placing the baby under a radiant heat source,
- Positioning the head in a "sniffing" position to open the airway,
- Clearing the airway if necessary with a bulb syringe or suction catheter,
- Drying the baby, and
- Stimulating respiration.

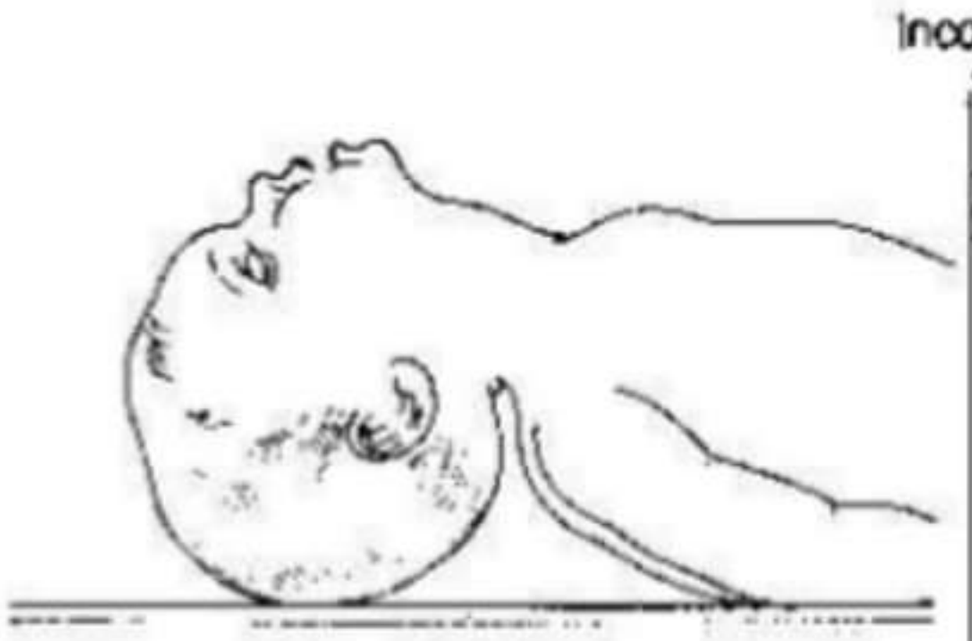
- The baby dried, placed skin-to-skin with the mother, and covered with dry linen to maintain temperature.

- Observation of breathing, activity, and color should be ongoing.

Correct

Neck Slightly Extended

Incorrect



Neck Hyperextended

Neck Underextended

ABCDE STEPS

- AIRWAY
- Position
- Clear airway and suction first mouth than nose

ABCDE STEPS

- B.BREATHING ADEQUACY

1. Tactile stimulation.
2. Free flow oxygen
3. ppV

ABCDE STEPS

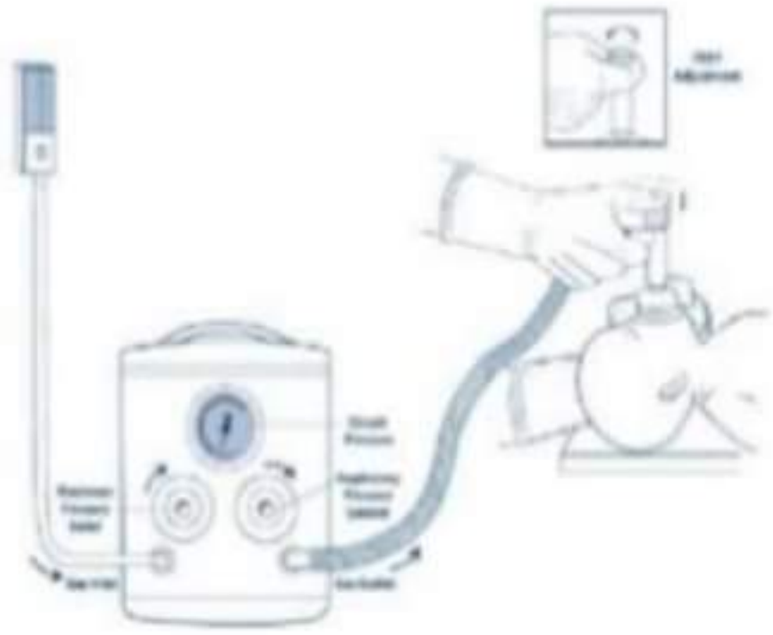
- C.cardiovascular resuscitation
- D.drug diagnosis
- E.environment control and extended care

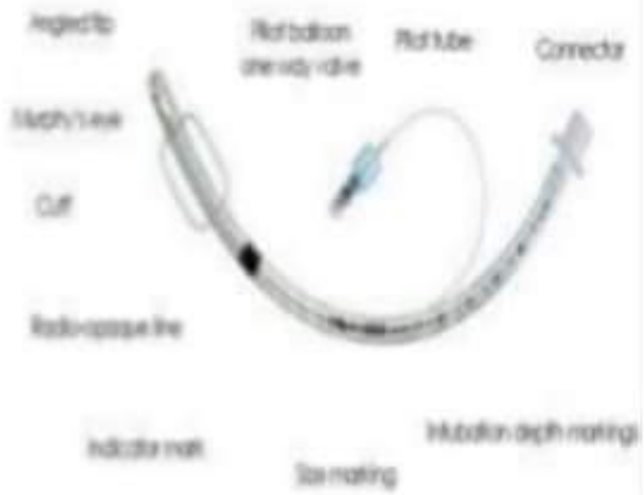
PPV

- Positive pressure ventilation means airway pressure applied at patients airway that causes the gas to flow into lungs.
- Indications
- apnea or gasping
- Heart rate<100
- Central cyanosis

PPV

- Ambu bag
- Flow dependent bag
- Endotracheal tube
- Tracheostomy tube
- T piece





- **The primary measure of adequate initial ventilation is prompt improvement in HR.**

- **Chest wall movement should be assessed if HR does not improve.**

- An initial peak inflation pressure of 20 cm H2O is effective, but 30-40 cm H_2O may be required in some term babies.
- If pressure is not being monitored, the minimal inflation required to achieve ↑ in HR should be used.

- Assisted ventilation @40-60 breaths/min to promptly achieve or maintain >HR 100/min.

Chest compression

- If after 15 to 30 sec of ppv with 100% oxygen
- the heart rate is below 60
- Between 60 to 80 and not increasing

- Compressions should be delivered on the lower third of the sternum to a depth of ≈1/3rd of the AP diameter of the chest.

- Two techniques:
  - compression with 2 thumbs with fingers encircling the chest & supporting the back
  - compression with 2 fingers with a second hand supporting the back.

- **The 2 thumb–encircling hands technique may generate higher peak systolic and coronary perfusion pressure than the 2-finger technique, So recommended in newborns**

- Compressions and ventilations should be coordinated to avoid simultaneous delivery.

- The chest should be permitted to reexpand fully during relaxation, but the rescuer's thumbs should not leave the chest.

- compressions to ventilations ratio 3:1 (i.e. ≈120 events/min to maximize ventilation at 90 compressions and 30 breaths

- If the neonate's condition does not improve rapidly with ventilation and tactile stimulation, an umbilical artery catheter should be inserted.

- Most preterm neonates weighing < 1250 gram at birth and 1-3% of term neonates require an umbilical artery catheter during resuscitation.

Umbilical venous catheter (UVC)

- **Most rapidly accessible intravascular route**
  - **to administer drugs (Adrenaline);**
  - **for fluid administration to expand blood volume,**
  - **to measure blood gase, pH and arterial BP,**
- **Provide continued vascular access until an alternative route is established**

Medications

- If heart rate is less than 60 despite of adequate ventilation and chest compression for 1min
- After using 100%oxygen

TABLE 4. Medications for Neonatal Resuscitation

Medication	Concentration to Administer	Preparation	Dosage/Route	Total Dose/Infant			Rate/Precautions
				Weight	**Total mL**		
Epinephrine	1 : 10,000	1 mL	0.1±0.3 mL/kg IV or IT	1 kg	0.1±0.3		Give rapidly
				2 kg	0.2±0.6		
				3 kg	0.3±0.9		
				4 kg	0.4±1.2		
				Weight	**Total mL**		
Volume expanders	Whole blood 5% albumin Normal saline solution Ringer's lactate	40 mL	10 mL/kg IV	1 kg	10		Give over 5±10 min
				2 kg	20		
				3 kg	30		
				4 kg	40		
				Weight	**Total Dose**	**Total mL**	
Sodium bicarbonate	0.5 mEq/mL (4.2% solution)	20 mL or two 10-mL prefilled syringes	2 mEq/kg IV	1 kg	2 mEq	4 mL	Give *slowly*, over at least 2 min
				2 kg	4 mEq	8 mL	
				3 kg	6 mEq	12 mL	Give only if infant being effectively ventilated
				4 kg	8 mEq	16 mL	
				Weight	**Total mL**		
Naloxone	0.4 mg/mL	1 mL	0.25 mL/kg IV, IM, SQ, IT	1 kg	0.25		
				2 kg	0.50		
				3 kg	0.75		
				4 kg	1.00		Give rapidly
	1.0 mg/mL	1 mL	0.1 mL/kg IV, IM, SQ, IT	1 kg	0.1		
				2 kg	0.2		
				3 kg	0.3		
				4 kg	0.4		
				Weight	**Total μg/min**		
Dopamine	$6 \times \frac{\text{weight (kg)} \times \text{desired dose } (\mu g/kg/min)}{\text{desired fluid(mL/hr)}} =$	mg of dopamine per 100 mL of solution	Begin at 5 μg/kg/min (may increase to 20 μg/kg/min if necessary) IV	1 kg	5±20		Give as a continuous infusion using an infusion pump Monitor HR and BP closely Seek consultation
				2 kg	10±40		
				3 kg	15±60		
				4 kg	20±80		

BP, blood pressure; HR, heart rate; IM, intramuscular; IT, intratracheal; IV, intravenous; SQ, subcutaneous.
American Heart Association/American Academy of Pediatrics: Textbook of Neonatal Resuscitation. Dallas, 1991

Postresuscitation Care

- Babies who require resuscitation are at risk for deterioration after their vital signs have returned to normal.

- Once adequate ventilation and circulation have been established, the infant should be maintained in, or transferred to an environment where close monitoring and anticipatory care can be provided.

Monitoring required may include:

- Oxygen saturation(SpO2)
- Heart rate and ECG
- Respiratory rate and pattern
- Blood glucose measurement
- Blood gas analysis
- Fluid balance and nutrition
- Blood pressure
- Temperature
- Neurological