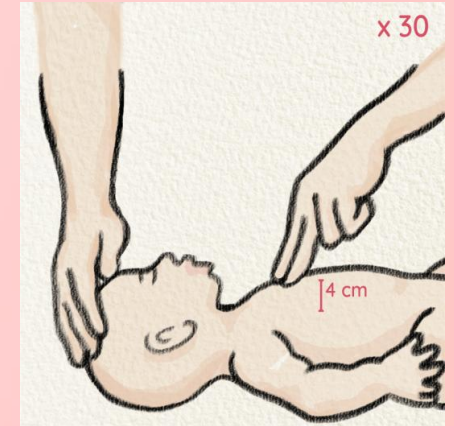


Neonatal Resuscitation



Asst.Prof. Duangporn Pasuwan

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What is Neonatal Resuscitation?

Neonatal resuscitation is emergency intervention for newborns with respiratory failure, low heart rate, or no spontaneous breathing at birth. Critical skills required within first minutes to prevent hypoxic-ischemic encephalopathy and death.

- Approximately 10% of newborns require some resuscitation; 1% need intensive intervention
- Perinatal asphyxia leading cause of neonatal death and disability globally
- Immediate intervention critical; outcomes depend on speed and quality of resuscitation
- Team-based approach required with clear role assignment and communication

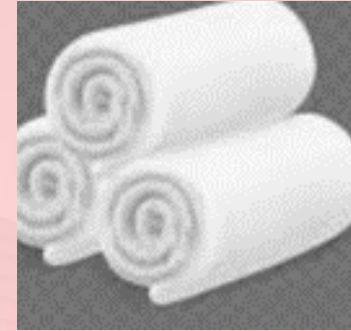


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Indications for Resuscitation

- **Respiratory Distress:** Gasping, ineffective breathing, severe retractions, grunting, nasal flaring
- **Bradycardia:** Heart rate <100 bpm, declining heart rate, poor perfusion
- **Apnea:** No spontaneous breathing despite stimulation; absent or gasping efforts
- **Cyanosis:** Central cyanosis unresponsive to oxygen therapy; severe hypoxemia





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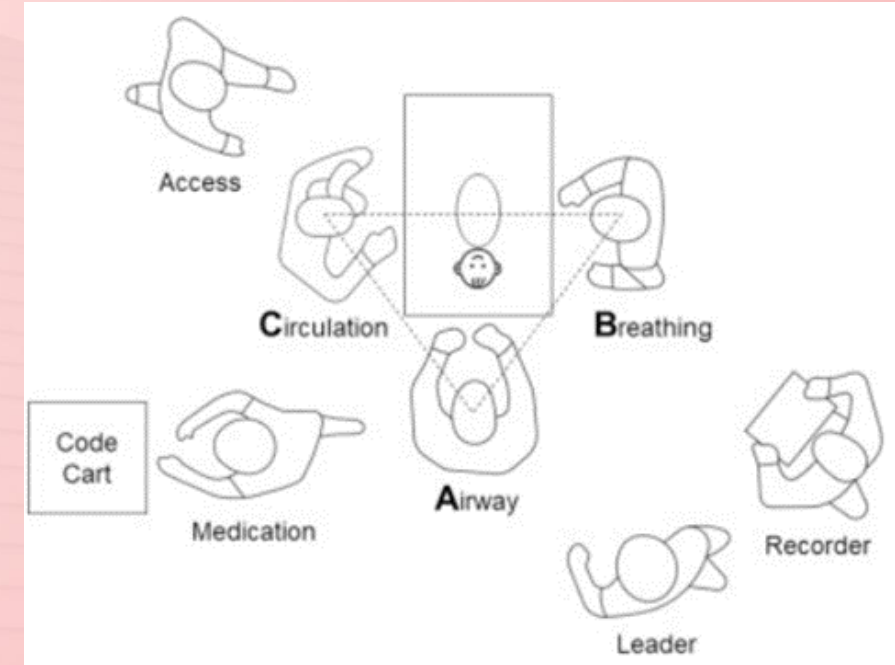
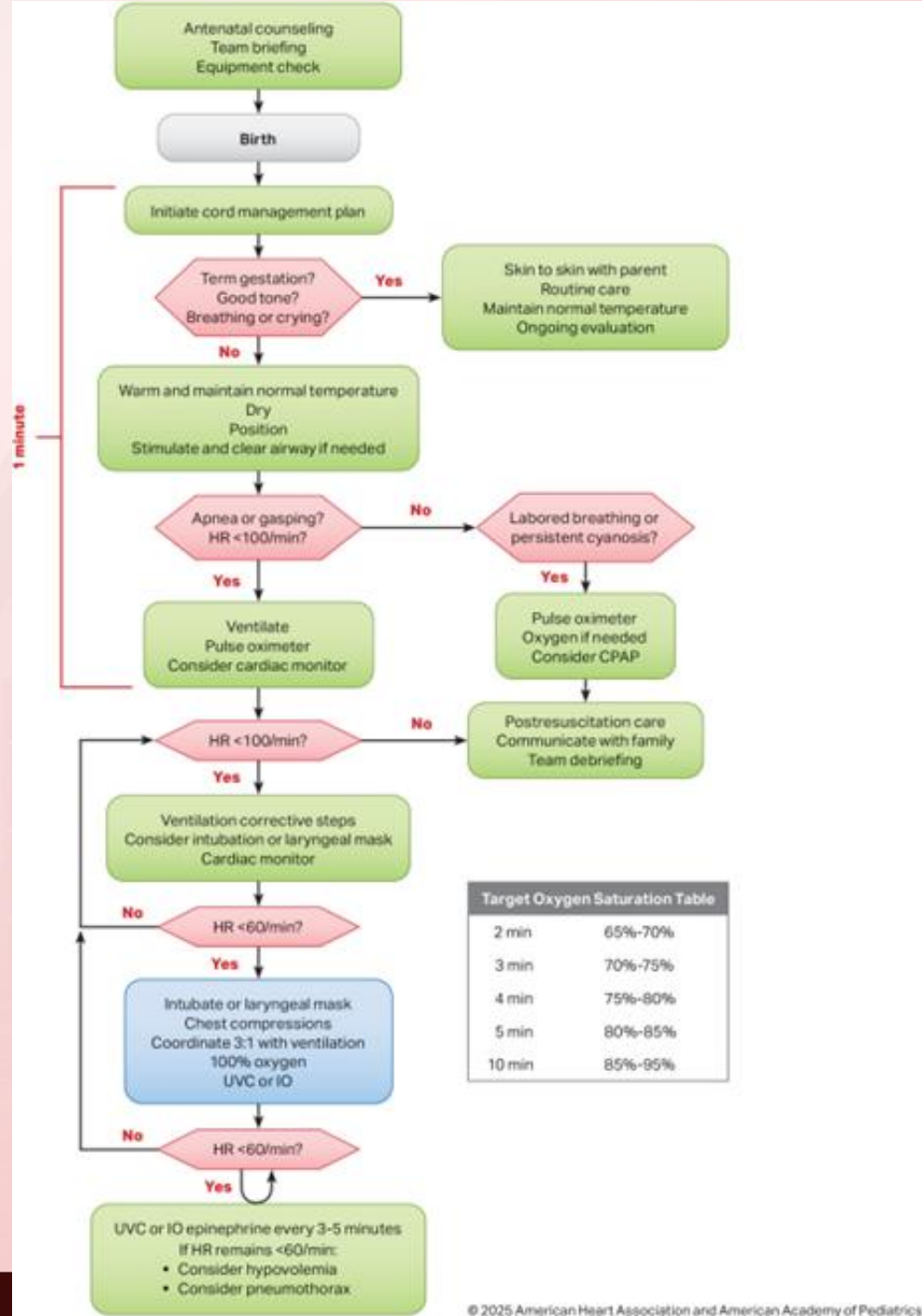
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APGAR Score & Assessment

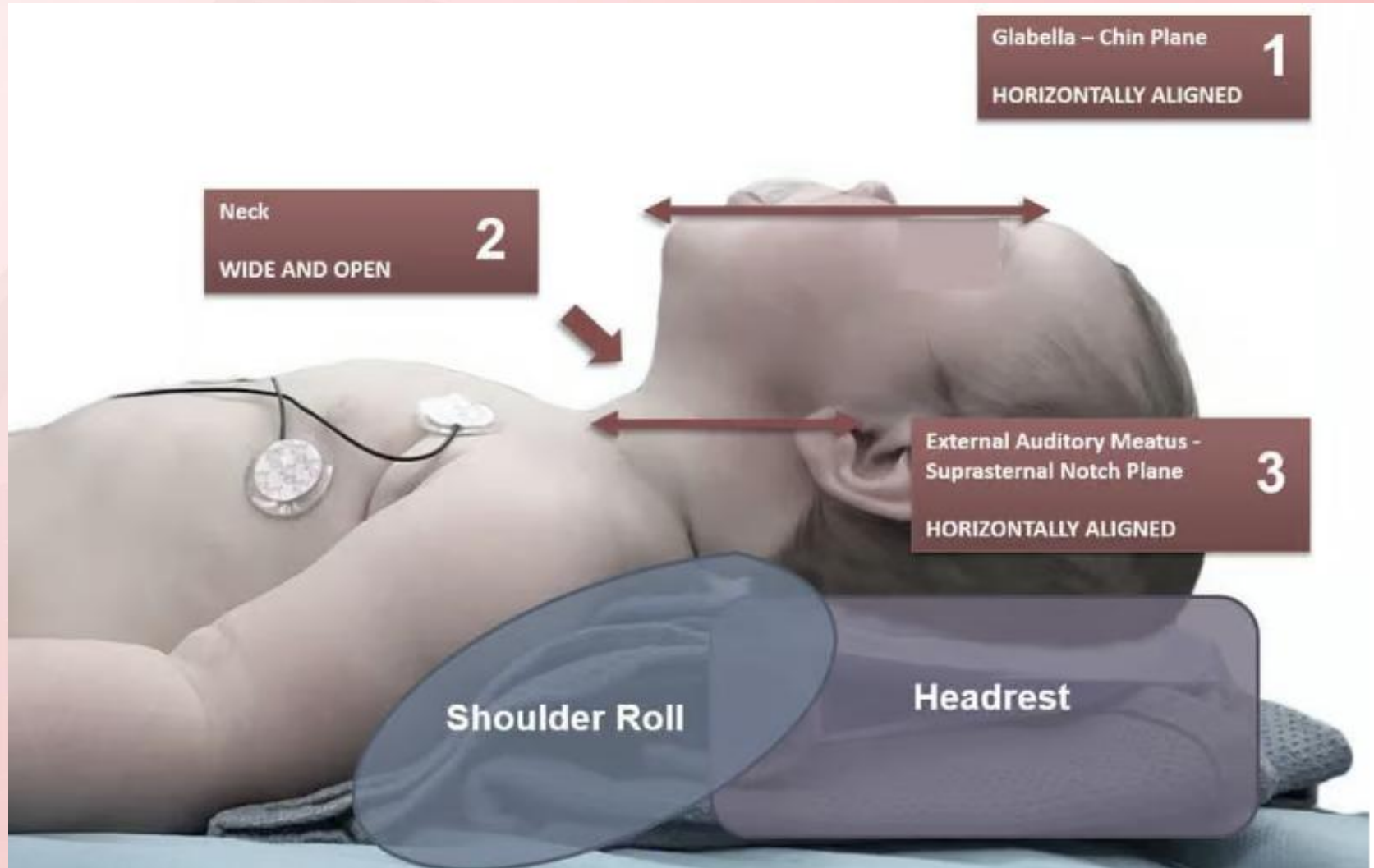
APGAR Components (Score at 1, 5, 10 min):

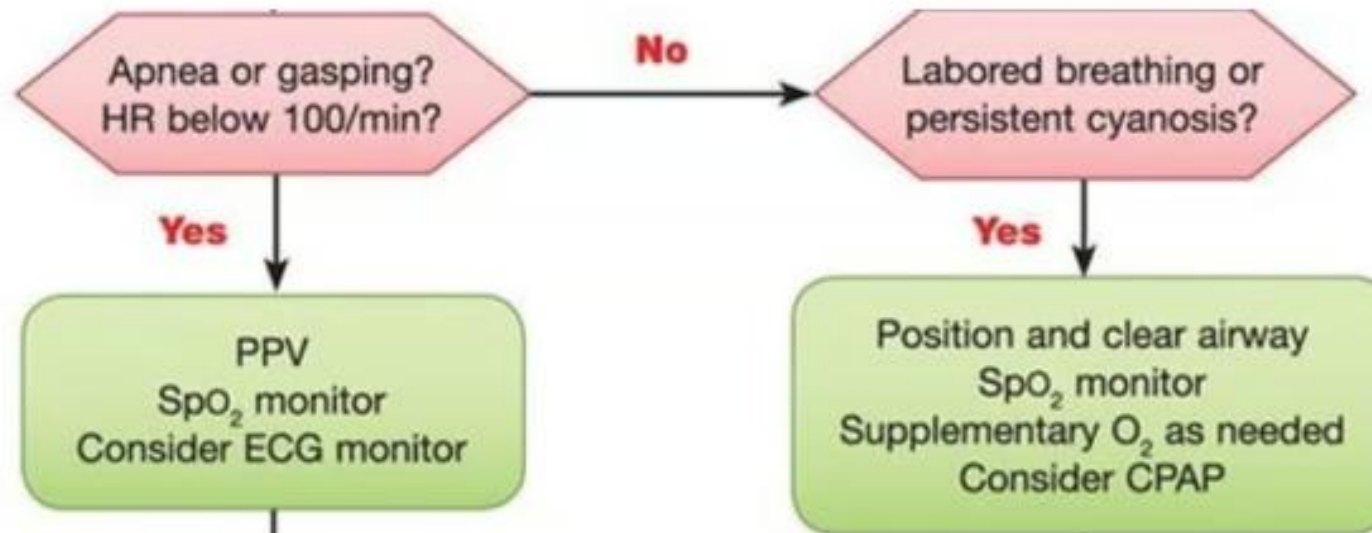
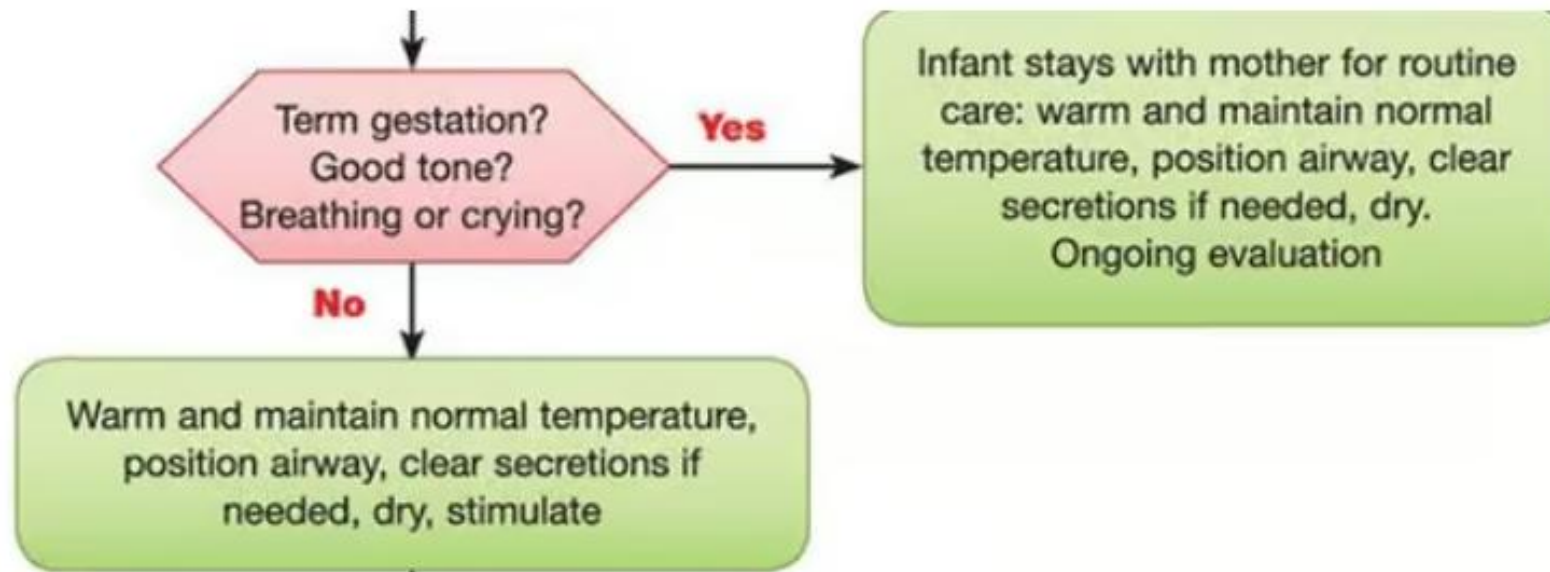
- **Appearance:** Pink (2) vs. blue extremities (1) vs. pale/cyanotic (0)
 - **Pulse:** >100 bpm (2) vs. <100 bpm (1) vs. absent (0)
 - **Grimace:** Cough/cry (2) vs. grimace (1) vs. no response (0)
 - **Activity:** Active (2) vs. decreased tone (1) vs. limp (0)
 - **Respiration:** Spontaneous, strong cry (2) vs. weak/irregular (1) vs. absent (0)
-
- **Score 7-10:** Minimal intervention
 - **4-6:** Moderate resuscitation
 - **0-3:** Intensive resuscitation needed

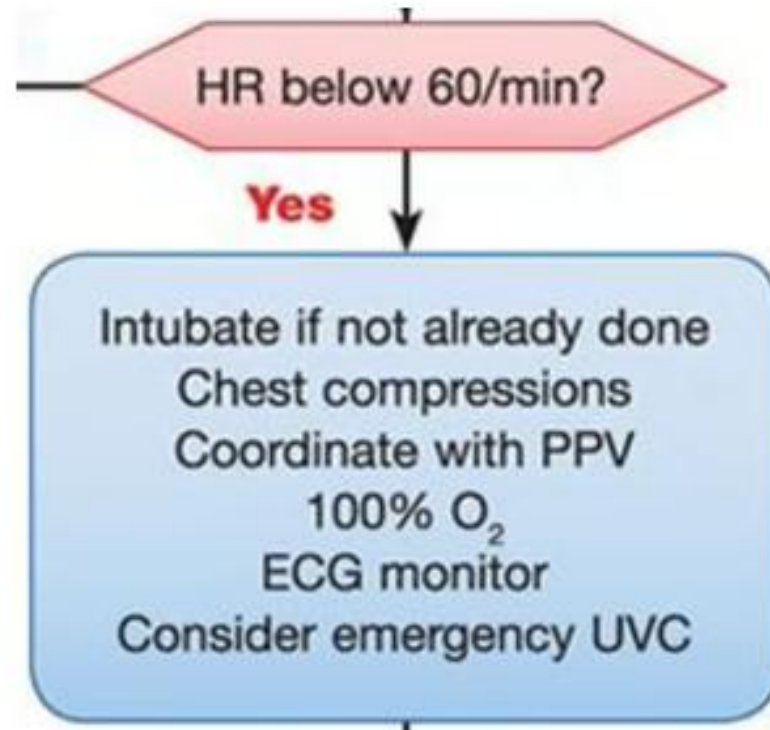
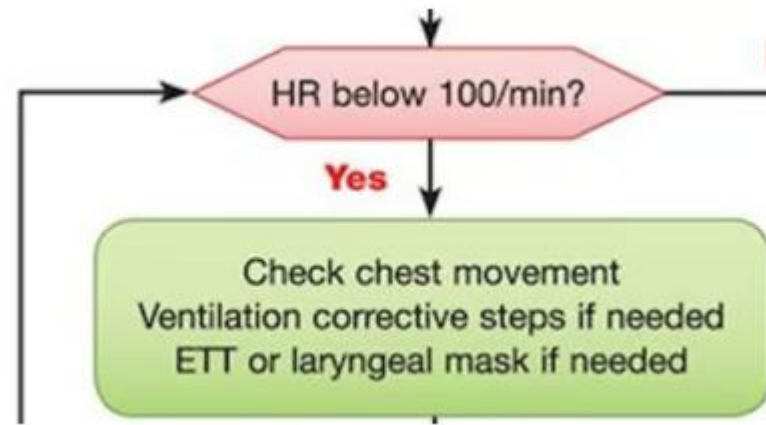




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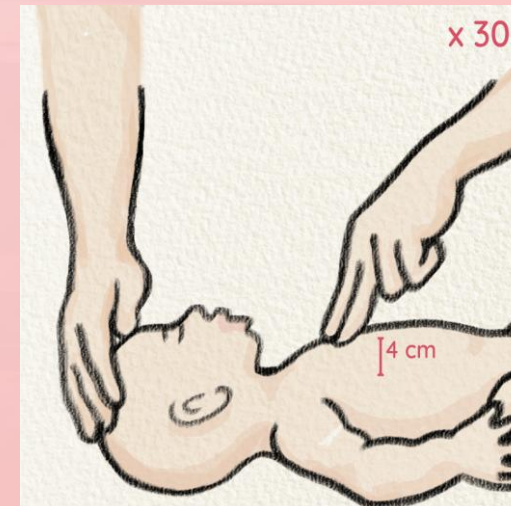




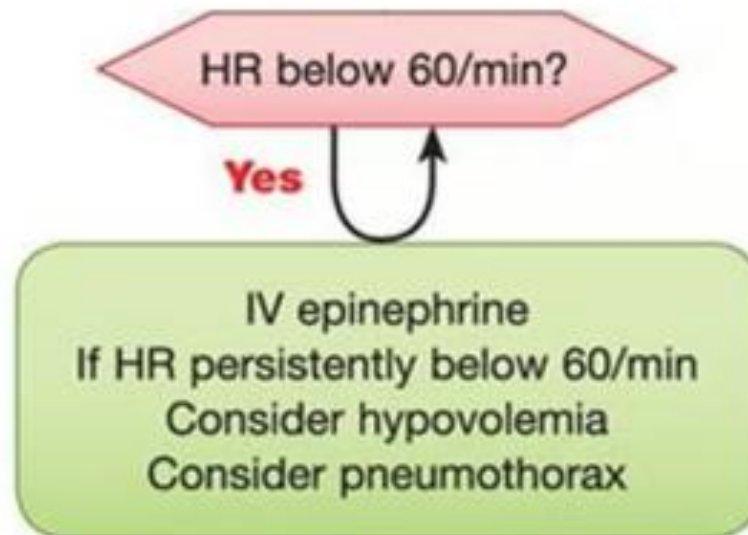


Targeted Preductal SpO₂ After Birth

1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

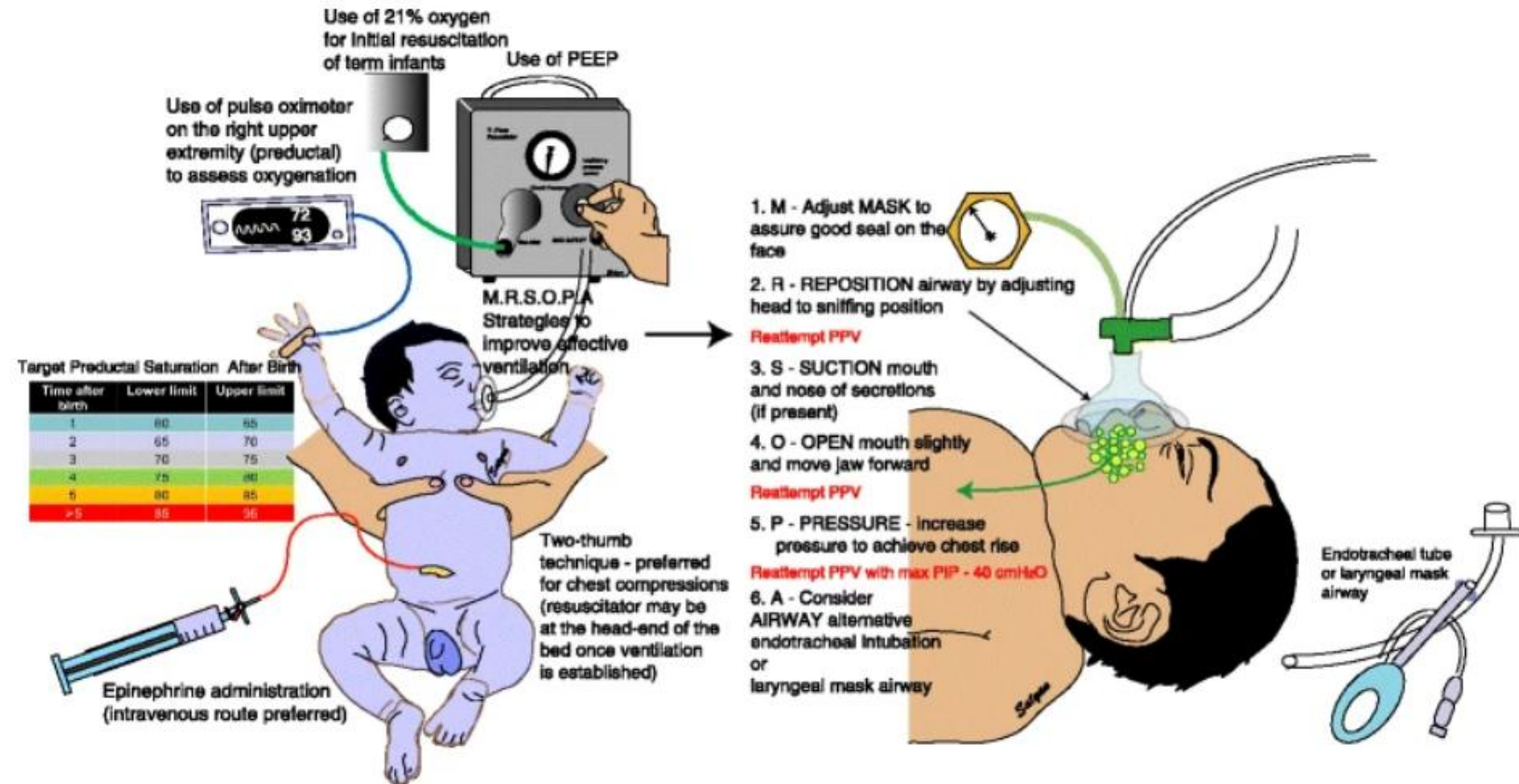


Birth Weight (kg)	Gestational Age (weeks)	ET Tube size (mm) Internal diameter	Insertion depth
< 1	< 28	2.5	6 – 7 cm
1 – 2	28 – 34	3.0	7 – 8 cm
2 – 3	34 – 38	3.5	8 – 9 cm
> 3	> 38	3.5 – 4.0	9 – 10 cm



Infant with Umbilical Catheter

Neonatal resuscitation: evolving strategies



from...<https://link.springer.com/article/10.1186/s40748-014-0003-0>

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Primary Nursing Diagnosis (I)

- **Ineffective Breathing Pattern** related to respiratory depression and apnea
- **Decreased Cardiac Output** related to bradycardia and poor perfusion
- **Ineffective Airway Clearance** related to meconium aspiration or fluid obstruction



Primary Nursing Diagnoses (II)

- **Risk for Hypoxia/Hypoxic-Ischemic Encephalopathy** related to perinatal asphyxia
- **Hypothermia Risk** related to post-resuscitation care needs and heat loss
- **Parental Anxiety** related to newborn emergency and uncertain outcomes





Resuscitation Algorithm: Initial Steps

Initial Assessment (First 15 seconds):

- **Rapid Evaluation:** Term gestation? Good muscle tone? Breathing or crying? Assess response to gentle stimulation
- **If YES to all:** Routine care only (maintain warmth, clear airway, dry skin, monitor)
- **If NO:** Proceed to resuscitation protocol; call for help immediately
- **Thermoregulation:** Dry newborn, remove wet linens, place under radiant warmer, monitor temperature
- **Positioning & Airway:** Head neutral (avoid extension/flexion), position on back, clear secretions (suction mouth, nose)

Resuscitation: Ventilation & Oxygenation

Positive Pressure Ventilation (PPV):

- If HR <100 bpm or apnea after initial steps: start PPV 21% oxygen (term) within 30 seconds
- Rate: 40-60 breaths/minute; assess for adequate chest rise (visible movement)
- If heart rate remains <100 bpm: increase oxygen to 100%; reassess technique
- If HR remains <60 bpm after 15 seconds 100% oxygen: begin chest compressions
- Mask seal, bag fit critical; may need endotracheal intubation if poor response



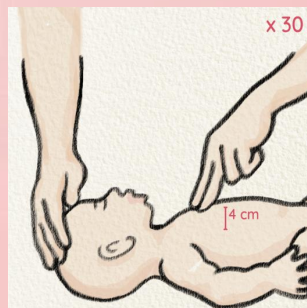
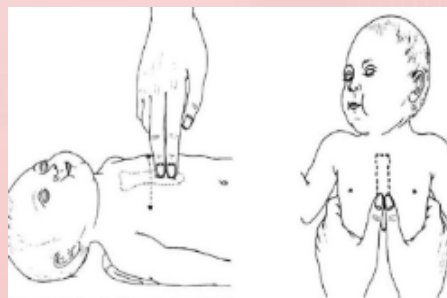
Chest Compressions & Medications

Chest Compressions (if HR <60 bpm):

- Technique: Two-thumb method (both thumbs depress sternum); depth 1/3 chest diameter
- Rate: 120 compressions/minute; synchronize with ventilation (3:1 compression-to-breath ratio)
- Reassess HR every 60 seconds; continue until HR >60 bpm sustained

Medications (via umbilical venous catheter):

- Epinephrine: 0.01-0.03 mg/kg IV if HR remains <60 bpm after 10 min resuscitation
- Sodium bicarbonate: Only after adequate ventilation established (metabolic acidosis)



Ineffective Breathing Pattern

Related to: Respiratory depression and perinatal asphyxia

Goal: Respiratory status normalized; spontaneous effective breathing;
HR >100 bpm; ABG normal



Interventions:

- Administer PPV with appropriate rate/pressure until spontaneous breathing established
- Monitor respiratory rate (30-60/min), depth, and effort continuously
- Obtain blood gas (ABG) to assess oxygenation, ventilation, acid-base status
- Position for optimal airway: neutral head position, avoid hyperextension
- Monitor SpO₂ (target >95%); adjust oxygen concentration as needed
- Consider continuous positive airway pressure (CPAP) or mechanical ventilation if needed

Post-Resuscitation Care & Monitoring

Immediate Post-Resuscitation:

- Thermoregulation: Maintain temperature 36.8-37.4°C (consider therapeutic hypothermia if HIE suspected)
- Continuous monitoring: HR, RR, SpO₂, BP, temperature; cardiac monitor and pulse oximetry
- IV access: Establish umbilical venous/arterial lines for fluids, medications, monitoring
- Frequent ABG monitoring, electrolytes, glucose levels; support metabolic stability
- Document resuscitation: time interventions started, medications given, response assessment
- Therapeutic hypothermia protocol if moderate-severe HIE suspected (cooling to 33-34°C)



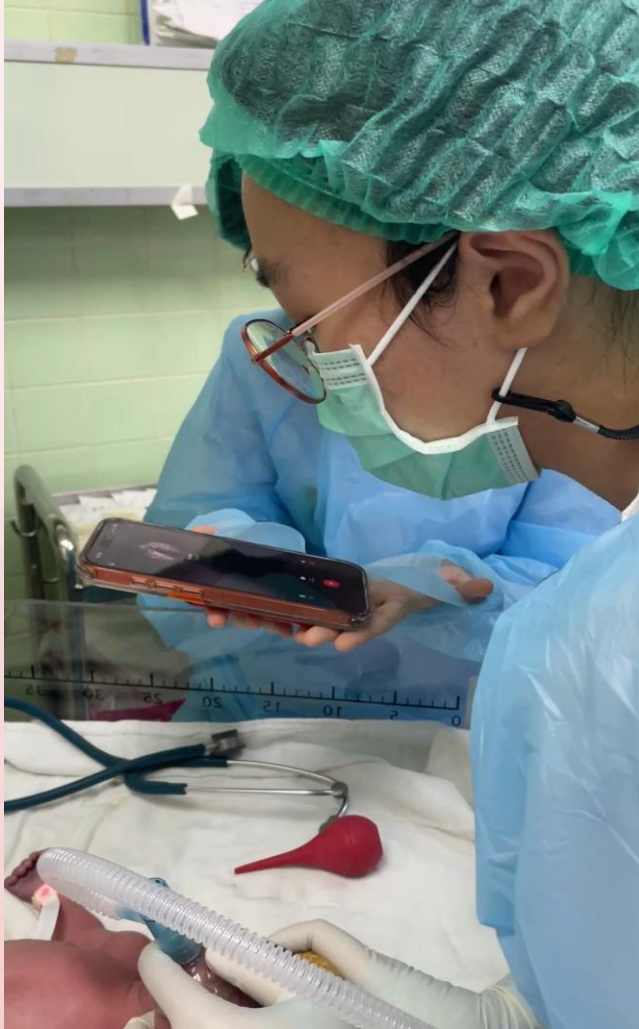
Infant with Umbilical Catheter

Case: female Myanmar 32 y. : G2P1

GA 31⁺¹ weeks, labor pain present,
laboratory normal, 152 cm, BMI 21 kg/m²

- admit LR I=3-4' D 30-45" Cx=2 cm
eff50% MI Sta -1
- inhibit Bricanyl by Protocol 2 days but
have UC , go on labor (can't inhibit)
- SRM : Thick meconium stain during Cx
fully IUR
- NL BW. 2125 gm APGAR 9,7,6
- Granting & retraction, PPV, Intubate
and transfer to NICU





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Perinatal association society
Neonatal resuscitation' 2025



NPH
(Neonatal
resuscitation)



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A large, colorful, and stylized 'Thank You!' message. The word 'Thank' is in a bold, blocky font with various colors (yellow, orange, green, purple) and decorative patterns like zig-zags and wavy lines. The word 'you!' is in a similar style, with the 'y' being green and the 'ou!' being blue and pink. There are several colorful flowers (blue, pink, yellow) and a large exclamation mark integrated into the design.

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