Pediatric Newborn Assessment, Treatment and Resuscitation

This protocol should be followed for all newly born infants.

Pre-Medical Control
MFR/EMT/SPECIALIST/PARAMEDIC

1. **As the infant is being born, rapidly evaluate each of these three (3) criteria:**
   A. Is this a full term delivery?
   B. Is the newborn breathing or crying
   C. Is there good muscle tone? (movement vs. flaccid)

2. **If the observation to ALL 3 criteria is YES:**
   A. Place the baby with the mother
   B. Provide warmth (See Preventing Heat Loss below)
   C. Clear the airway if necessary (See Airway Management below)
   D. Dry the baby
   E. Provide ongoing evaluation
   F. Record APGAR scores at 1, 3 and 5 minutes (see APGAR chart)
   G. Cut the umbilical cord (see Umbilical Cord Management below)

3. **If the observation to ANY of the 3 criteria is NO:**
   A. Provide warmth (See Preventing Heat Loss below)
   B. Clear the airway if necessary (see Airway Management below)
   C. Dry the baby
   D. Stimulate

4. **Check Heart Rate**
   A. 100 +, proceed to **Check Breathing**
   B. Under 100
      a. Assist ventilations with a bag valve mask (see Airway Management below)
      b. Monitor SpO2 (see Target SpO2 Goals)
5. **Check Breathing**
   A. Non-labored and no cyanosis
      a. HR 100+: go to "A" above
      b. HR below 100, continue to assist ventilations and reevaluate
   B. Labored breathing or persistent cyanosis
      a. Clear airway
      b. Monitor SpO2 (see target SpO2 goals)
      c. Assist ventilations if HR below 100 or core cyanosis

6. **Reevaluate HR**
   A. 100+: go to "A" above
   B. Below 100 but more than 60: continue to support ventilations
   C. Under 60:

a. Begin compressions at 3:1 ratio (See CPR below)
b. Coordinate compressions with ventilations

7. **Reevaluate HR**
   A. 100+: monitor closely to ensure stability
   B. Below 100 but more than 60: continue to support ventilations

SPECIALIST/PARAMEDIC
   C. If HR begins to decline or cyanosis worsens despite ventilatory support, consider intubation
   D. Establish IO or IV
   E. Reevaluate

MFR/EMT/SPECIALIST/PARAMEDIC
   A. Below 60: Continuous CPR at 3:1

SPECIALIST/PARAMEDIC
   B. Establish IO or IV

PARAMEDIC
   C. Provide epinephrine (1:10,000) 0.01mg/kg IO or IV

8. **Other considerations**

SPECIALIST/PARAMEDIC
   A. If known blood loss, consider Normal Saline bolus 10mL/kg
   B. Evaluate blood glucose, if < 60 mg/dl administer dextrose 10% (1 gm/10 ml), 0.2 gm/kg IV/IO.
   C. To obtain 10 % Dextrose mixture draw 40 ml out of one amp of D50 and discard, then add 40 ml of NS.

PARAMEDIC
   D. If known or suspected narcotics use by the mother, consider naloxone 0.1mg/kg IO or IV

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9. **Preventing Heat Loss:**
   A. Dry off amniotic fluid and remove all wet linen.
   B. Maintain a warm environment for the infant
   C. Rubber gloves filled with warm water (if available) can serve as heat packs. DO NOT apply directly to skin.
   D. Extreme CAUTION should be used if chemical heat packs are used to provide warmth. Never place directly on or near the infant's skin. Keep multiple layers between to avoid burns.

10. **Airway Management**
    A. If the newborn is vigorous (strong respiratory effort, good muscle tone, and a heart rate > 100 bpm), there is no need to suction the airway, even if meconium was in the amniotic fluid or there was meconium staining.
    B. Positive pressure ventilation should use the minimum volume and pressure to achieve perceptible chest rise and/or achieve or maintain a HR>100.

SPECIALIST/PARAMEDIC

    C. If the newborn is having difficulty breathing, has poor muscle tone, has a heart rate less than 100bpm, or there is visible meconium in the airway,
        a. The patient should be intubated and the lower airway suctioned via ET tube (with LOW PRESSURE (80-120mmHg) suction to the tube)
        b. Repeat suction with new tube each time.
    D. Consider placing a gastric tube, if available, to decompress the stomach when positive pressure ventilation is required.
    E. If intubation is indicated due to ongoing and persistent central cyanosis, lack of chest rise or other complication, despite adequate ventilation:
        a. SpO2 must be measured
        b. Waveform capnography must be used if available
        c. Consider Pneumothorax

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11. **CPR**
    A. Two thumbs encircling the chest technique is preferred. Compressions and ventilations should occur in a 3:1 ratio and should be done quickly enough to provide 90 compressions and 30 ventilations per minute.
    B. Newborns who have required resuscitation are at risk for deterioration even after a return to normal vital signs, reassess frequently
    C. Avoid excessive volume or rate with ventilation.

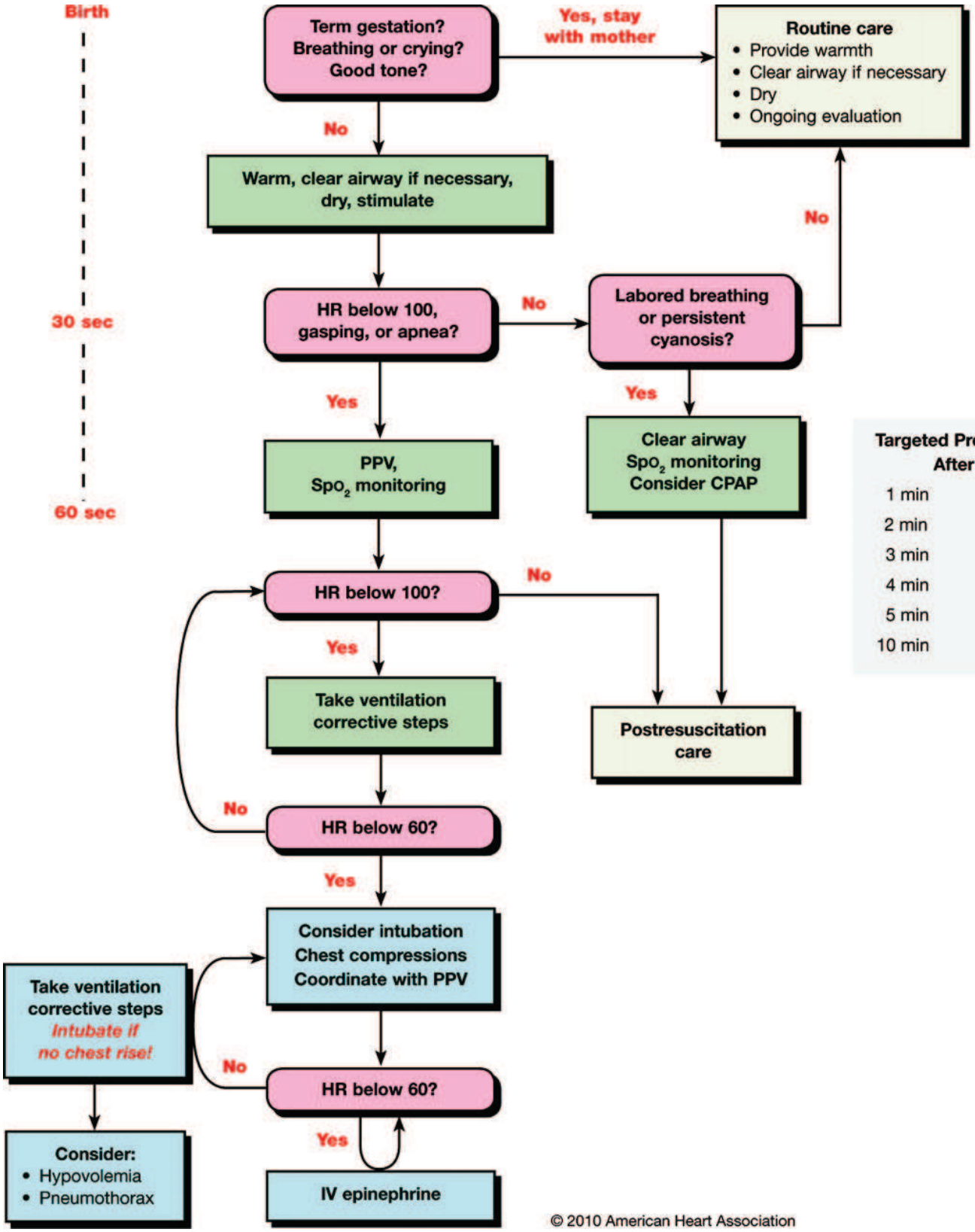
12. **Umbilical Cord Management**
    A. The umbilical cord **should not** be cut immediately; wait until the child is breathing adequately, the cord has stopped pulsating or, in the vigorous infant, two to three minutes post delivery. When prepared to cut the cord, it must be tied or clamped approximately 8" from the infant's abdominal wall with a second tie or clamp 2" further. The cord should be cut between the ties / clamps.

13. **Target SpO2 Goals**
    A. Monitor SpO2 and apply oxygen only if SpO2 goes below target of :
        - 1 minute post delivery (60-65%)
        - 3 minutes post delivery (70-75%)
        - 5 minutes post delivery (80-85%)
        - 10 minutes post delivery (85-95%)

APGAR SCORING

Sign	0	1	2
Appearance – skin color	Bluish or paleness	Pink or ruddy; hands or feet are blue	Pink or ruddy; entire body
Pulse – heart rate	Absent	Below 100	Over 100
Grimace – reflex irritability to foot slap	No response	Crying; some motion	Crying; vigorous
Activity – muscle tone	Limp	Some flexion of extremities	Active; good motion in extremities
Respiratory effort	Absent	Slow and Irregular	Normal; crying

NOTE: Resuscitation may not be appropriate in rare cases where gestational age (confirmed gestational age <20 weeks) or fatal birth defects (for example anencephaly or absence of skull bones and brain hemispheres) are consistently associated with certain early death. Contact Medical Control in these cases.



Targeted Preductal Spo_2 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%