Newborn Assessment, Treatment and Resuscitation

To provide a process for the assessment and management of the newborn.

MFR/EMT/SPECIALIST/PARAMEDIC

Assessment Information

1. History
   a. Approximate gestation age (weeks)
   b. History of maternal drug usage just prior to delivery
   c. Evidence of meconium in amniotic fluid

2. Assess and document APGAR score at 1 and 5 minutes, or with changes in patient’s presentation
   a. APGAR and normal vital charts are at the end of this protocol.

Pre-Medical Control

1. Prevent heat loss
   a. Place patient in warm environment.
   b. Dry off amniotic fluid and remove all wet linen.
   c. Rubber gloves filled with warm water (if available) can serve as heat packs. DO NOT apply directly to skin.
   d. Use of chemical heat packs is prohibited unless they are specifically designed as infant warmers.
   e. The umbilical cord 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 and clamps.

2. Establish and maintain an airway
   a. Position patient by placing patient on back with padding under shoulders to maintain head in neutral position.
   b. If the newborn is vigorous (strong respiratory effort, good muscle tone and a heart rate over 100 bpm), there is no need to suction the airway.
   c. If the newborn is lethargic, having difficulty breathing, has poor muscle tone, has a heart rate less than 100 bpm, or there is visible meconium in the airway,

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i. The patient should be intubated and the lower airway suctioned via ET tube [with LOW PRESSURE (80-120 mmHg) suction to the tube]
   ii. Repeat suction with new tube each time

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d. Provide tactile stimulation to induce breathing
   i. Flick soles of feet and gently rub back
ii. If infant remains apneic, tactile stimulation should be abandoned and ventilation should be initiated with 100% high flow $O_2$.

3. Evaluate Respirations, Heart Rate and Color
   a. If the infant is breathing, the heart rate is above 100 bpm, and the infant is pink:
      i. Observe and continue with routine care and evaluation.
   b. If the infant is breathing, the heart rate is above 100 bpm, and the infant is cyanotic:
      i. Give supplemental oxygen
      ii. If the cyanosis persists, provide ventilations, with a bag-valve mask and 100% oxygen, at 40 to 60 breaths/min when performed with compressions
   c. If the infant is apneic or the heart rate is less than 100 and greater than 60 bpm:
      i. Provide ventilations via bag valve mask with 100% oxygen.
      ii. Rate of 40-60 breaths/min when performed without chest compressions.
   d. If heart rate is less than 60 bpm:
      i. Perform chest compressions 3:1 compression-ventilation ratio
      ii. 120 events/min (90 compressions interspersed with 30 ventilations).

PARAMEDIC
   e. If the heart rate remains below 60 bpm despite compressions and ventilations:
      i. Administer epinephrine and/or volume (dosing below)
      ii. If evidence of maternal opiate use prior to or during delivery administer naloxone (dosing below)
      iii. Evaluate blood glucose and administer 5% dextrose, if indicated.

SPECIALIST/PARAMEDIC
   f. If ventilatory support is prolonged with no patient improvement endotrachael intubation should be considered.

PARAMEDIC
   g. Transport and Contact Medical Control

Medication Used in Resuscitation of the Newborn
   1. Epinephrine
      a. 1:10,000, 0.01-0.03 mg/kg (0.1-0.3 ml/kg) IV/IO
         i. Give rapidly
         ii. Repeat every 3-5 minutes
      b. ETT, up to 0.1 mg/kg
i. ETT route may be used as a last resort if IV/IO cannot be established.

2. Volume Expanders
   a. Normal Saline 20 ml/kg IV/IO
      i. Indicated for shock
      ii. Give over 5 to 10 minutes
      iii. Reassess after each bolus

3. Dextrose 10% (1gm/ml)
   a. Dose 0.2 gm/kg IV/IO
   b. To obtain 10% Dextrose mixture draw 40 ml out of one amp of D50 and discard, then add 40 ml of NS

4. Nalaxone (Narcan) – POST MEDICAL CONTROL ORDER ONLY
   a. Dose 0.1 mg/kg IV/IO or IM
   b. Administration guidelines
      i. Establish adequate ventilation first; not recommended for initial resuscitation
      ii. Give rapidly
      iii. Repeat every 2-3 minutes as needed
      iv. Caution on opioid – addicted mothers

5. Sodium Bicarb – POST MEDICAL CONTROL ORDER ONLY
   a. Dose 1 to 2 mEq/kg IV/IO
   b. Concentration 0.5 mEq/ml (4.2% solution)
   c. Administration guidelines
      i. Only for prolonged resuscitation
      ii. Use only if infant is effectively ventilated before administration
      iii. Give slow push, minimum of 2 minutes

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Special Considerations
1. Ventilation should always be accompanied with supplemental O₂.
2. Heart rate may be checked by apical pulse or feeling at the base of the cord.
3. Preventing heat loss in the newborn is critical (dry and discard wet linen).
4. APGAR score should be checked at 1 min and 5 min.
5. Most patients will respond well to tactile stimulation or ventilation. Intubation and meds may not be needed.
6. Capillary refill is an excellent indicator of perfusion in infants. Color should return in 3 seconds or less.
APGAR SCORING

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Rate</td>
<td>Absent</td>
<td>Below 100</td>
<td>Over 100</td>
</tr>
<tr>
<td>Respiration (effort)</td>
<td>Absent</td>
<td>Slow and Irregular</td>
<td>Normal; crying</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>Limp</td>
<td>Some flexion of extremities</td>
<td>Active; good motion in extremities</td>
</tr>
<tr>
<td>Irritability</td>
<td>No response</td>
<td>Crying; some motion</td>
<td>Crying; vigorous</td>
</tr>
<tr>
<td>Skin Color</td>
<td>Bluish or paleness</td>
<td>Pink or ruddy; hands or feet are blue</td>
<td>Pink or ruddy; entire body</td>
</tr>
</tbody>
</table>

**Term Newborn Normal Vital Signs**

- **Heart rate (awake):** 100 to 180 bpm
- **Respiratory Rate:** 30 to 60 breaths/min
- **Systolic blood pressure:** 55 to 90 mmHg
- **Diastolic blood pressure:** 26 to 55 mmHg