Newly Born

History
- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium / Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors such as substance abuse or smoking

Signs and Symptoms
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential
- Airway failure, Secretions, or Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia, Hypoglycemia, Hypothermia
- Congenital heart disease

In a non-vigorous infant whose respirations are not improving after warming, drying, and stimulating within 30 seconds, move quickly to Positive Pressure Ventilation with BVM

Breathing or Crying?
Term Gestation?
Good Muscle Tone?

ALL YES →
- **Warm, Dry, and Stimulate infant**
- **Infant with mother if possible *(skin-to-skin)***
- **Maintain normal temperature**
- Bulb suction airway only if needed
- Monitor and Reassess
- **Notify Destination or Contact Medical Control**

ANY NO ↓

- **Warm, Dry and Stimulate**
- **Bulb suction airway if needed**
- ***If not breathing within 30 seconds move quickly to next step: BVM***

Agonal breathing or Apnea?
Or
Heart Rate < 100 / min
Or
Labored breathing/ Persistent cyanosis
If not improving within 30 seconds move quickly to next step

YES →
- Position and clear airway if necessary
- **BVM Ventilations with or without O_2**
- **Ventilation Rate: 40 – 60 breaths/ minute**
- **B** Pulse Oximetry Right Hand
- **P** Cardiac Monitor 3 or 4 – Lead

Heart Rate < 100

YES →
- Check chest movement
- Change airway position
- Change BVM Technique
- **Add O_2 if not already providing**
- Pediatric Airway Protocol(s) AR 5, 6 ***if no improvement***

NO ↓

Heart Rate < 60

YES →
- ***Chest Compressions See Pearls Compression 1:2:3 and BVM breath; repeat***
- Pediatric Airway Protocol(s) AR 5, 6
- IV or IO Access Protocol UP 6
- **A** **Epinephrine 1:10,000**
  0.01 mg /kg IV / IO
  Every 3 to 5 minutes as needed
- **A** **Normal Saline Bolus**
  10 mL / kg IV / IO
  If not responding to epinephrine
  May repeat x 1
- Blood Glucose Analysis Procedure
- **A** **<u>Blood Glucose < 40 mg/dL</u>**
  Administer 2 mL/kg of D10 IV / IO
  Repeat as needed CBG ≥ 40 mg/dL

NO ↓

- ***Supplemental Oxygen (See Pearls for expected SpO_2)***
- Maintain warmth
- Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Obstetrical Protocol Section

Newly Born

Adult Obstetrical Protocol Section

Temperature Control:

- Infants, especially low birth weight or premature infants are prone to hypothermia.
- Keeping the baby dry and well covered will prevent hypothermia.
- **In general infant should be held by mother with skin-to-skin contact to maintain warmth.**

EMS PROVIDER SHOULD NOT CARRY INFANT into hospital facility. INFANT SHOULD BE HELD BY MOTHER WITH SKIN-TO-SKIN CONTACT. Carrying a newborn infant is difficult and could result in loss of control with subsequent injury.
Provider may sit in a wheelchair and carry infant after arriving at the receiving facility.

Hypoglycemia:

Routine blood glucose checks are not warranted, however check blood glucose with neonate failing or slow to respond to normal resuscitative effort. Neonate with a blood glucose < 40 should receive D10 as needed. Use **2 mL/kg of D10 in the Neonate (this is different than the Rule of 50)**

GUIDELINES FOR WITHHOLDING RESUSCITATION:

Gestational age < 23 weeks	Gross deformity incompatible with life.
Anencephaly (part of head or brain missing)	Parents desire DNR

Pearls

- **Recommended Exam: Quality of Cry, Muscle tone, Respirations, Heart Rate, Pulse Oximetry, and Gestational Age**
- **Majority of newborns do not require resuscitation, only warming, drying, stimulating, and cord clamping.**
  - **With term gestation, strong cry/ breathing, and good muscle tone, generally will not need resuscitation.**
  - **If no resuscitation needed, skin-to-skin contact with the mother is best way to maintain warmth of infant.**
  - **Maintain warmth of infant following delivery adjuncts; cap/ hat, plastic wrap, thermal mattress, radiant heat.**
  - **Most important vital signs in the newly born are heart rate, respirations, and respiratory effort.**
  - **About 10% of newborns need assistance to help them start breathing after birth.**
  - **About 1% of newborns require intensive resuscitation to restore/ support cardiorespiratory functions.**
- **Airway:**
  - **Positive Pressure Ventilations with BVM is the most important treatment in a newborn with poor respirations and/ or persistent bradycardia (HR < 100 BPM).**
  - **When BVM is needed, ventilation rate is 40 – 60 breaths per minute.**
  - **Adequacy of ventilation/ is measured mainly by increase in heart rate as well as chest rise.**
  - **If heart rate or respirations are not improving after 30 to 60 seconds of resuscitation, place BIAD or endotracheal tube.**
  - **Routine suctioning is no longer recommended, bulb suction only if needed.**
- **Breathing:**
  - **Oxygen is not necessary initially, but if infant is not responding with increased heart rate or adequate breathing, add oxygen to the BVM.**
- **Circulation/ Compressions:**
  - **Heart rate is critical during first few moments of life and is best monitored by 3 or 4 lead ECG, as pulse assessment is difficult in the neonate. Heart Rate is best tool for gauging resuscitation success.**
  - **If heart rate remains < 60 BPM after 30 to 60 seconds of BVM/ resuscitation, begin compressions.**
  - **With BIAD or ETT in place, compressions and ventilation should be coordinated with compression, compression, compression, then ventilation. (3:1 ratio with all events totaling 120 per minute)**
  - **2-thumbs encircling chest and supporting the back is recommended. Limit interruptions of chest compressions.**
- **If infant not responding to BVM, compressions, and/ or epinephrine, consider hypovolemia, pneumothorax, and/ or hypoglycemia (< 40 mg/dL).**
- **Document 1 and 5 minute APGAR in PCR or ePCR. DO NOT delay or interrupt resuscitation to obtain an APGAR score.**
- **Meconium staining:**
  - **Infant born through meconium staining who is NOT vigorous:**
  - **Bulb suction mouth and nose and provide positive pressure ventilation.**
  - **Direct endotracheal suctioning is no longer recommended.**
- **Expected Pulse Oximetry readings following birth:**
  - ***(Accurate only in infant NOT requiring resuscitation)***

1 minute	**60 – 65%**
2 minutes	**65 – 70%**
3 minutes	**70 – 75%**
4 minutes	**75 – 80%**
5 minutes	**80 – 85%**
10 minutes	**85 – 95%**

- Pulse oximetry should be applied to the right upper arm, wrist, or palm.
- Cord clamping:
  - Recommended to delay for 1 minute, unless infant requires resuscitation.
- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended, use supportive care only).
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline) or **D10 solution at 2 mL/kg IV / IO.**
- **In the NEONATE, D10 is administered at 2 mL/kg.** *(NOT 5 mL/kg in the pediatric patient after the first month of life.)*

Apgar score

	Score 2	Score 1	Score 0
Appearance	Pink	Extremities blue	Pale or blue
Pulse	> 100 bpm	< 100 bpm	No pulse
Grimace	Cries and pulls away	Grimaces or weak cry	No response to stimulation
Activity	Active movement	Arms, legs flexed	No movement
Respiration	Strong cry	Slow, irregular	No breathing