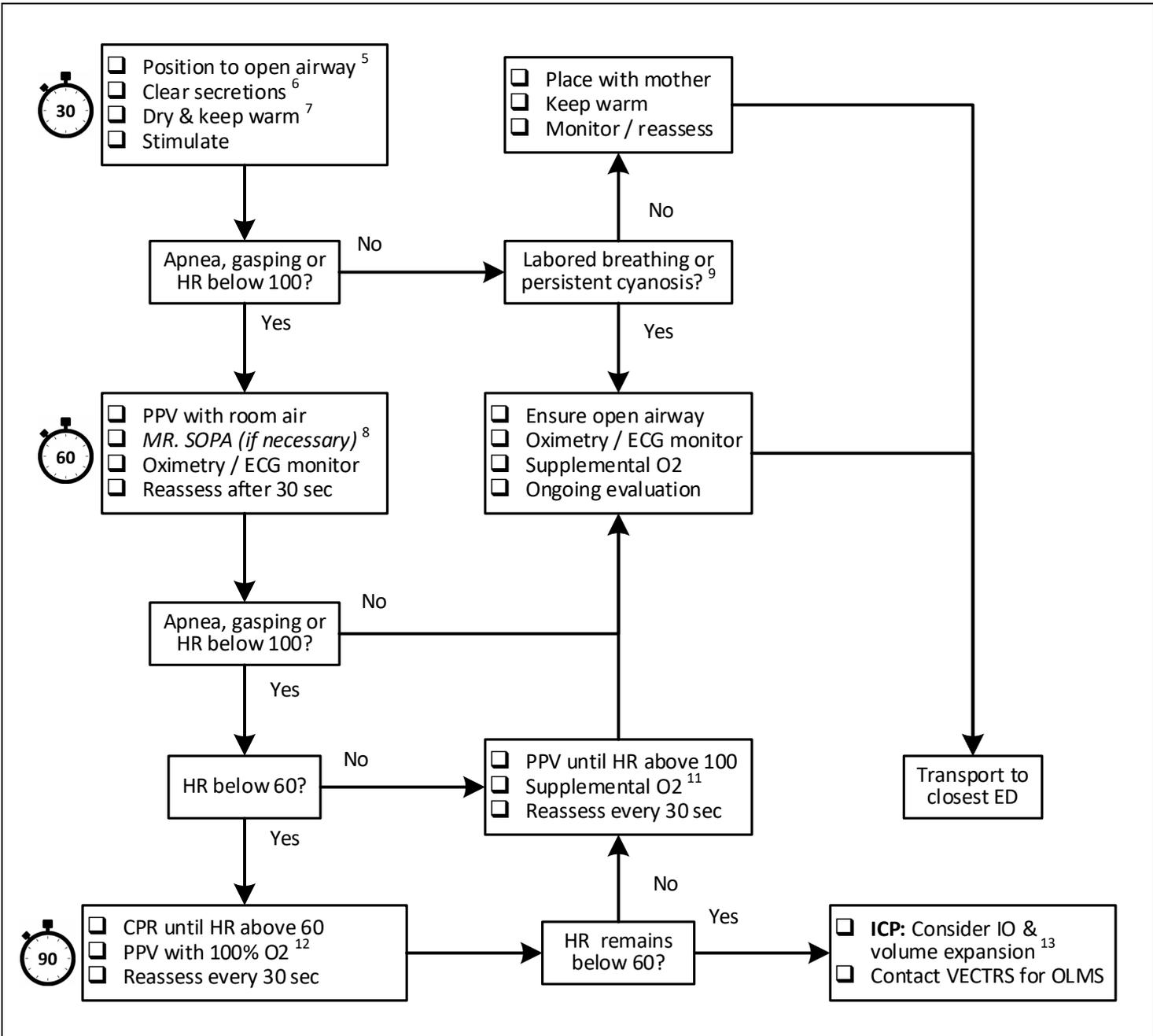


	D03 - NEWBORN CARE & RESUSCITATION	
	MATERNAL & NEWBORN CARE	
Version date: 2023-09-17	Effective date: 2024-02-13 (0700)	



IDENTIFIER:	EMR: EMR only	PCP: PCP & ICP	ICP: ICP only	None - All providers
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QRG #1: NEONATAL CARDIOPULMONARY RESUSCITATION (CPR)

POSITIVE PRESSURE VENTILATION	CHEST COMPRESSIONS
40 to 60 per minute x <u>30 seconds</u> <i>“Breathe . . . two . . . three . . . “</i>	120 per minute (3 to 1 with PPV) x <u>30 seconds</u> <i>“One & two & three & breathe . . . “</i>

QRG #2: VENTILATION CORRECTIVE STEPS (MR. SOPA)

STEP #1: MASK ADJUSTMENT & REPOSITION HEAD	<ol style="list-style-type: none"> 1. Reapply the mask (consider the two-hand technique) 2. Reposition the head in a neutral or slightly extended position 3. Initiate PPV & assess chest movement & breath sounds
STEP #2: SUCTION & OPEN AIRWAY	<ol style="list-style-type: none"> 1. Use a bulb syringe or suction catheter to suction mouth then nose 2. Open the mouth & lift the jaw forward 3. Initiate PPV & assess chest movement & breath sounds
STEP #3: PRESSURE INCREASE	<ol style="list-style-type: none"> 1. Increase ventilation pressure in increments of 5 to 10 (max = 40 mmHg) 2. Temporarily occlude BVM pop-off valve (careful about barotrauma) 3. Initiate PPV & assess chest movement & breath sounds
STEP #4: ALTERNATIVE AIRWAY	<ol style="list-style-type: none"> 1. PCP: Consider <u>size 1</u> laryngeal mask airway (LMA) 2. Initiate PPV 3. Assess chest movement & breath sounds

QRG #3: SpO₂ DURING INITIAL MINUTES AFTER BIRTH (RIGHT HAND)

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

INDICATIONS

- Preterm newborn (less than 36 weeks)
- Poor muscle tone
- Not crying or breathing
- Labored breathing or persistent cyanosis
- Bradycardia (HR less than 100 bpm)

CONTRAINDICATIONS

- Newborn known with certainty to be less than 20 weeks gestational age ²

NOTES

1. Neonatal emergencies are fortunately rare but can be very stressful. Be prepared and call early for assistance or intercept. Consult on-line medical support (OLMS) at any time.
2. Unless it can be confirmed that a fetus is less than 20 weeks gestational age or an intrauterine death has already occurred, paramedics must initiate resuscitative efforts (appendix A).
3. Neonatal compromise is most commonly due to apnea or hypoventilation causing hypoxemia. The focus is on effective ventilation of the baby's lungs. The vast majority of newborns will respond to initial basic measures. Some may *briefly* require ventilatory assistance. A few may briefly require chest compressions. Vascular access and epinephrine administration are rarely necessary and usually unattainable in the prehospital setting.
4. In neonatal resuscitation every set of actions should be completed in 30 seconds. Every round of PPV or CPR should be performed for 30 seconds (see quick reference guide #1), and the breathing and heart rate is reassessed every 30 seconds.
 - By **30** seconds the airway should be opened and the infant stimulated to breath if required.
 - By **60** seconds positive pressure ventilation (PPV) should be initiated if required.
 - By **90** seconds chest compressions initiated if required.
5. Place the head in the "sniffing" position, using a shoulder role if required. Avoid excessive neck flexion or extension.
6. Suction the mouth before the nose ("M before N") with a bulb syringe. If using a suction catheter, do not exceed 80 to 100 mmHg of negative pressure.
7. In infants less than 32 weeks gently dry (to avoid damaging their fragile skin) and cover the torso and limbs with plastic wrap (to preserve moisture and warmth).
8. Visualizing chest rise and palpation of the umbilical pulse may be difficult in a smaller infant. Auscultation with a stethoscope is the preferred method for assessing both ventilations and heart rate.

If you cannot hear air entry with your first few ventilations, implement ventilation corrective steps using the mnemonic "MR. SOPA" (see quick reference guide #2).
9. With labored breathing, persistent central cyanosis, or abnormal oxygen saturation (SpO₂), administer free-flowing supplemental O₂ at 5 liters per minute, by holding the open end of the oxygen tubing close by the baby's mouth and nose.

Normal newborn SpO₂ increases over about ten minutes after birth (see quick reference guide #3). Measuring at the right hand approximates normal productal values, and can be used to determine if abnormal SPO₂ persists.
10. PPV can be performed without a sealed airway during newborn resuscitation, regardless of the mother's COVID status (A09).
11. When providing PPV without chest compressions, use a O₂ flow rate of 5 liters per minute and remove the reservoir (this will deliver about 30 to 35%). Slowly reduce ventilatory support as possible when the HR is greater than 100 bpm.
12. When providing PPV with chest compressions, provide O₂ at a flow rate of 10 liters per minute with a reservoir (this will deliver as close to 100% as possible).

13. A newborn may be in hypovolemic shock due to fetal-maternal hemorrhage, placental or umbilical trauma, vasa previa with hemorrhage, or even extensive vaginal bleeding. If not responding to chest compressions and PPV consider establishing intraosseous (IO) access and administering 0.9% (normal) saline at 10 ml/kg over 5 to 10 minutes. If no response, consider a second bolus of 10 ml/kg over 5 to 10 minutes.

LINKS

- A09 - AEROSOL GENERATING MEDICAL PROCEDURES
- D02 - PREHOSPITAL DELIVERY

APPROVED BY



EMS Medical Director



EMS Associate Medical Director

VERSION CHANGES (refer to X04 for change tracking)

- Caveat that sealed airway is not required for PPV
- Identifier legend at bottom of flow chart replaces work scope statement in header

APPENDIX A: MISCARRIAGE, STILLBIRTH, & PERINATAL DEATH

Pregnancy dating can be challenging and discrepancies of 1 to 2 weeks can have profound implications for survival. Estimating gestational age (GA) by recall of dates may be inaccurate. Fetal age can most reliably be determined by ultrasound (US) but even that will have some margin of error (up to a week in early pregnancy).

Before 20 weeks a fetus is universally regarded as incapable of survival outside of the womb and delivery before 20 completed weeks is termed a **miscarriage**. Delivery after 20 weeks but before the full gestational term (37 to 38 weeks) is called a **premature birth**.

A fetus that delivers at 22 completed weeks *might* survive with immediate resuscitative efforts, and the probability of survival improves with increasing GA. There are a few reports of neonates less than 22 weeks surviving with immediate resuscitative efforts and aggressive post-resuscitation care.

A death that occurs after 20 completed weeks but *before* the onset of labor is called a **stillbirth**. Before 28 weeks it is known as an **early stillbirth**, and after 28 weeks it is referred to as a **late stillbirth**. An early stillbirth will sometimes present with signs of tissue degeneration (or maceration), but this finding may be more subtle or absent in later stillbirths. Other signs commonly associated with stillbirth, such as fused eyelids or translucent skin, are unreliable or difficult for the novice to discern.

Deaths that occurs *during* labor are known as **perinatal deaths**. Some occur during labor (**late fetal death**) and some occur after delivery of a liveborn (**early neonatal death**). Many early neonatal deaths are due to absent or ineffective respirations and can be prevented by prompt initiation of resuscitative measures.

It may be quite challenging to differentiate a premature liveborn with absent vital signs from a stillborn fetus, especially with a late stillbirth. It may be equally as challenging to distinguish late fetal death from a viable neonate without signs of life. **Unless it can be confirmed that the gestational age (GA) is less than 20 weeks or intrauterine death has already occurred, paramedics must consider all neonates viable and initiate resuscitative efforts.**