Resuscitation of the Newborn

Raymond Hernandez

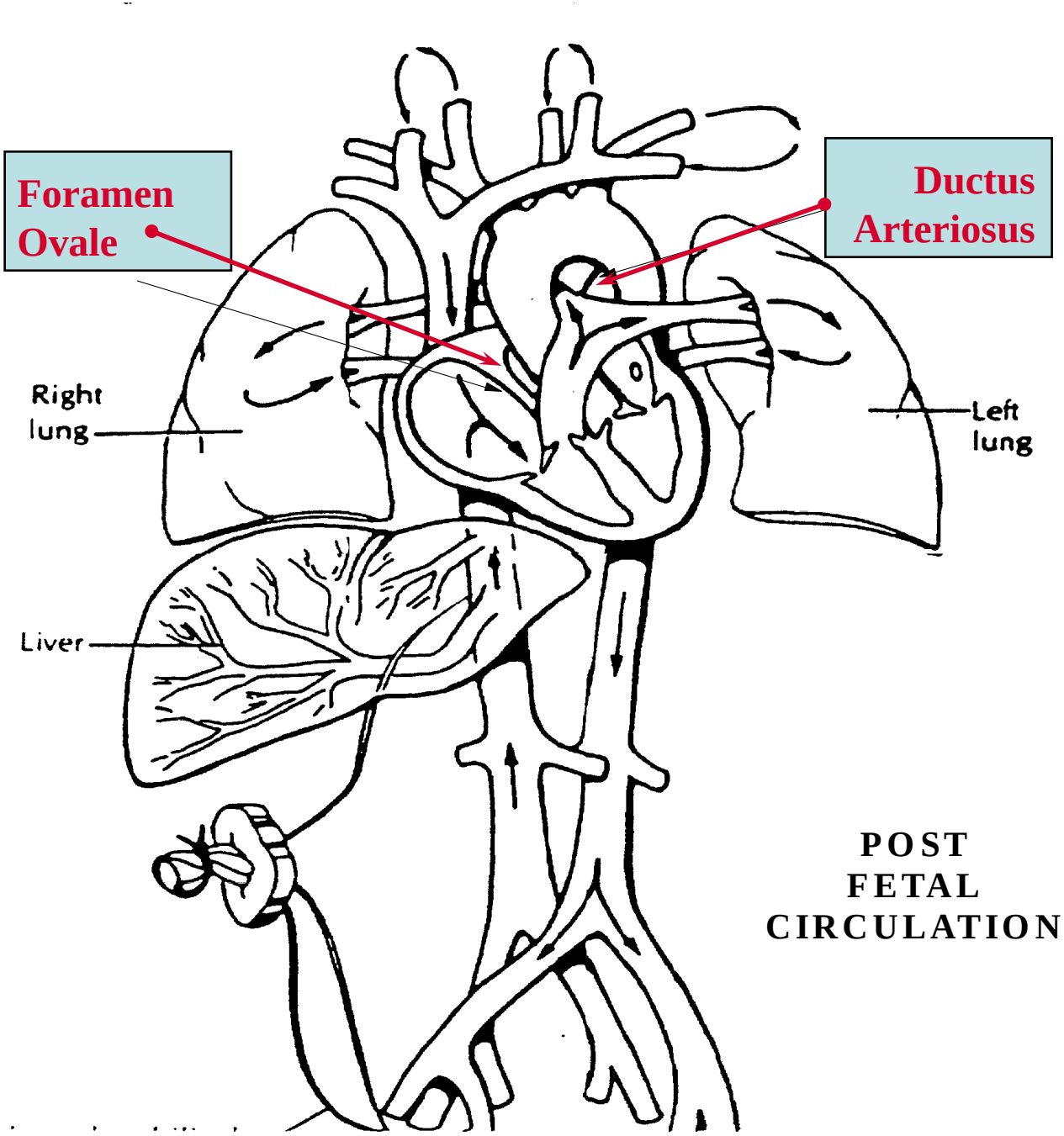
NRP

Foramen Ovale

•Pressures in the left side of the heart exceed pressure in the right side of the heart.
•One way valve closes

Ductus Arteriosus

•Increased Oxgen levels vasoconstricts Ductus
•Decreased prostaglandin production (PGE1)
•Production of bradykinins

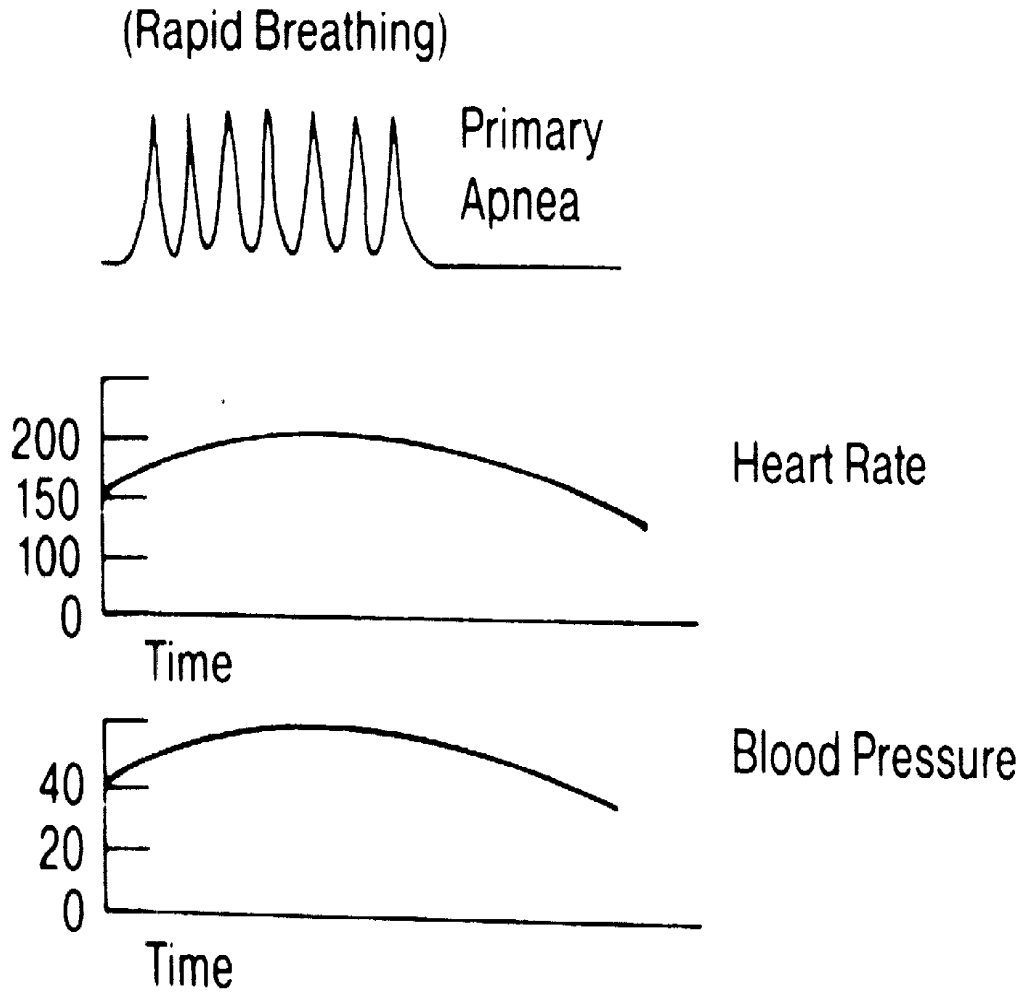


POST FETAL CIRCULATION

PRIMARY APNEA

Oxygen and stimulation will usually induce respiration.

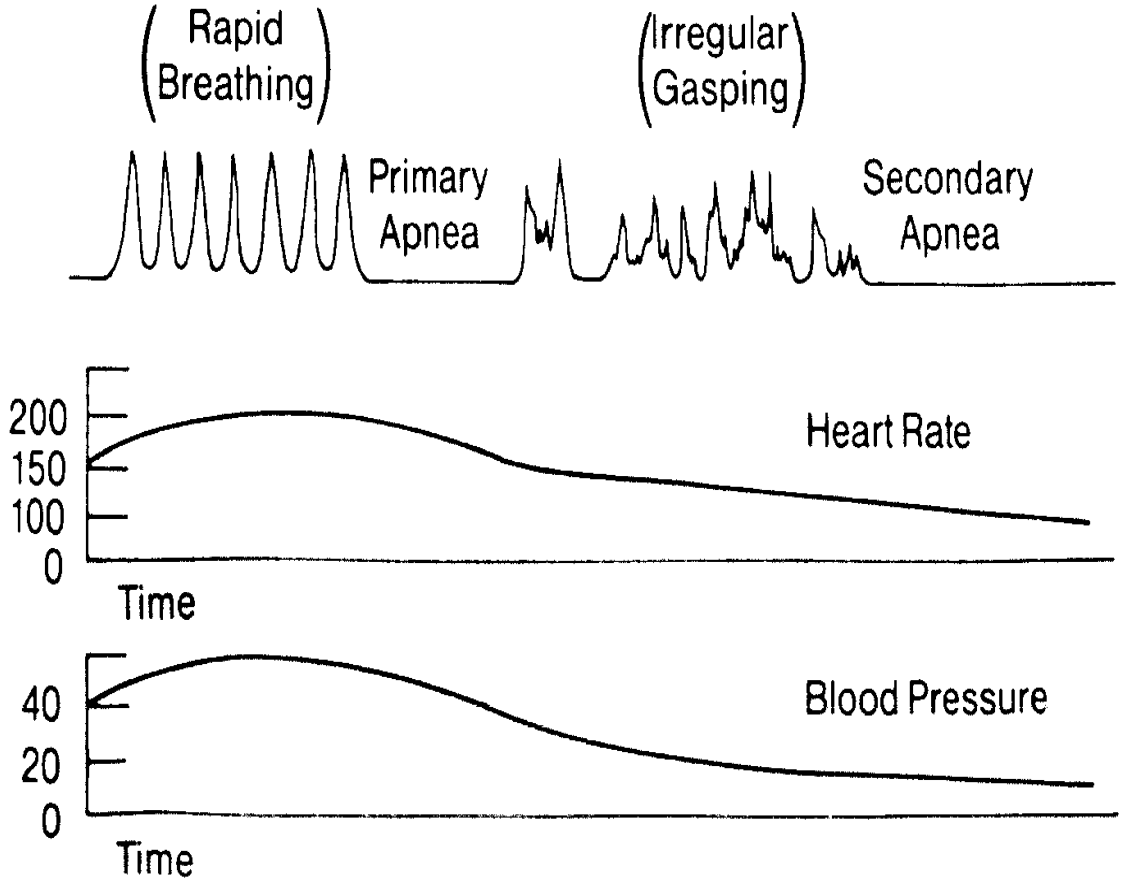
- **Deprivation of oxygen**
- **Period of rapid breathing occurs**
- **Asphyxia continues**
- **Respiratory efforts cease**
- **heart rate begins to fall**



SECONDARY APNEA

- Asphyxia continues
- Deep irregular gasping respirations occur
- Heart rate continues to decrease
- Blood pressure begins to fall
- Respirations become weaker and cease
- Heart rate, blood pressure and Pa02 continue to decrease

UNRESPONSIVE TO STIMULATION ARTIFICIAL RESPIRATION WITH OXYGEN IS INITIATED



CAUSES OF FETAL ASPHYXIA

- **Maternal Hypoxemia**
  - Low environmental oxygen
  - Apnea associated with seizures of eclampsia
  - Acute asthma attack
  - Pneumonia
  - Hypoventilation
  - Carbon monoxide poisoning or anemia

CAUSES OF FETAL ASPHYXIA

- **Insufficient placental blood flow**
  - Diminished blood flow to the placenta secondary to congestive heart failure
  - Hypotension and shock
  - Vasoconstrictive states secondary to toxemia and essential hypertension
  - Placenta previa
  - Abruptio placentae

CAUSES OF FETAL ASPHYXIA

- **Blockage of umbilical blood flow**
  - **Prolapse of the umbilical cord**
  - **Occult prolapse of the umbilical cord**
  - **Nuchal cord (wrapping of the cord around the fetal neck or body)**

CAUSES OF FETAL ASPHYXIA

- **Fetal disorders**
  - Hydrops fetalis (fetal cardiac failure in utero)
  - Fetal hypotension from hemorrhage or drugs
  - Fetal hemolytic anemia

PREPARATION FOR RESUSCITATION

- **Anticipation of a high-risk delivery requires:**
  - Maternal history
  - History of the pregnancy
  - Continuous monitoring during labor and delivery
- **Equipment**
  - Proper equipment
  - Variety of sizes to suit various gestational ages
  - Checked for proper function each shift

PREPARATION FOR RESUSCITATION

- **Trained personnel**
  - At least one person trained in all necessary skills
  - Must be present in the hospital to respond to unexpected high-risk deliveries

NEONATAL RESUSCITATION SUPPLIES AND EQUIPMENT

- **Suction equipment**
  - **Bulb syringe**
  - **Suction catheters 5, 6, 8, 10 french**
  - **8 fr. feeding tube with 20 cc syringe**

NEONATAL RESUSCITATION SUPPLIES AND EQUIPMENT

- Bag and Mask Equipment
  - Infant resuscitation bag with a pressure-release valve or pressure gauge- the bag must be capable of delivering 90-100% oxygen
  - Face masks (newborn and premature sizes
  - Oral airways-newborn and premature sizes

NEONATAL RESUSCITATION SUPPLIES AND EQUIPMENT

- **Intubation Equipment**
  - Laryngoscope with straight blades- No. 0 (premature) and No. 1 (newborn)
  - Extra bulb and batteries for laryngoscope
  - Endotracheal tubes - sizes 2.5, 3.0, 3.5, 4.0
  - Stylet
  - Scissors
  - Gloves

NEONATAL RESUSCITATION SUPPLIES AND EQUIPMENT

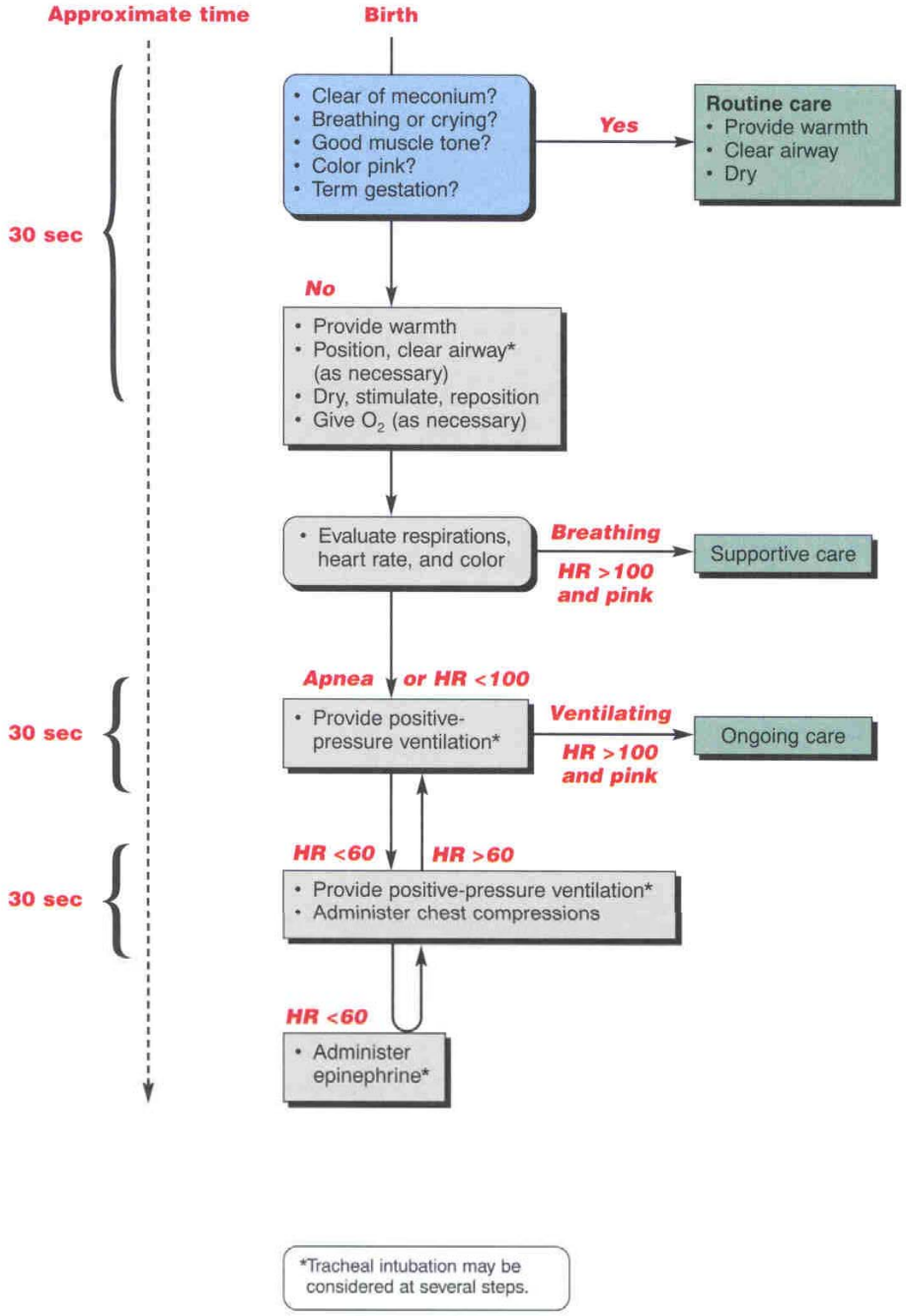
- Medications
  - Epinephrine 1:10,000
  - Naloxone hydrochloride (neonatal NARCAN)
  - Volume expanders (Albumin %5, Normal saline, Ringers lactate
  - Sodium Barcarbonate 4.2%
  - Dextrose 10%
  - Sterile water
  - Normal saline

Neonatal Resuscitation Meds

Medication	Concentration to Administer	Preparation	Dosage & Route	Rate & Precautions
Epinephrine	1:10,000 (0.1 mg/l)	1 ml	0.1-0.3 ml/kg IV or IT	Give rapidly, may repeat every 5-10 minutes.
Volume Expanders	Whole Blood, 5% Albumin, Normal Saline, Ringer's Lactate	Varies	10 ml/kg IV	Give over 5-10 minutes. Repeat as needed.
Sodium Bicarbonate	0.5 meq/ml (4.2% solution)	20 ml or two 10 ml prefilled syringes	2 meq/kg (4 ml/kg) IV	Give slowly, over at least 2 minutes, may repeat every 10 minutes. Ventilate infant.
Narcan (Naloxone)	0.4 mg/ml	1 ml	0.1 mg/kg (0.25 ml/kg) IV, IM, SQ, IT	Give rapidly.
Calcium Gluconate	100 mg/ml (10% solution, 0.465 mEq/ml)	10 ml	100 mg/kg (1 ml/kg) IV	Give over 3-5 minutes, may repeat every 15 minutes. Do not mix with sodium bicarbonate in line.

NEONATAL RESUSCITATION SUPPLIES AND EQUIPMENT

- **Miscellaneous**
  - Radiant warmer
  - Stethoscope
  - Tape, syringes, needles,alcohol swabs
  - Umbilical artery catheter
  - 3 way stop cock
  - 5 fr feeding tube


Approximate time
Birth
30 sec
• Clear of meconium?
• Breathing or crying?
• Good muscle tone?
• Color pink?
• Term gestation?
Yes
Routine care
• Provide warmth
• Clear airway
• Dry
No
• Provide warmth
• Position, clear airway* (as necessary)
• Dry, stimulate, reposition
• Give O_2 (as necessary)
• Evaluate respirations, heart rate, and color
Breathing
HR >100 and pink
Supportive care
Apnea or HR <100
30 sec
• Provide positive-pressure ventilation*
Ventilating
HR >100 and pink
Ongoing care
HR <60
HR >60
30 sec
• Provide positive-pressure ventilation*
• Administer chest compressions
HR <60
• Administer epinephrine*
*Tracheal intubation may be considered at several steps.

MECONIUM RESUSCITATION

- Identification of Meconium:
  - Thin discolored without particulate
  - Thick particulate (pea-soup)
  - Staining of fingernails and umbilical cord

NEONATAL RESUSCITATION SUPPLIES AND EQUIPMENT

Suction at perineum
DO NOT STIMULATE BABY!!!!!!!!!!!!!!!
Intubate with meconium aspirator tube
Suction
Repeat till clear

If the baby is decompensating, the resuscitator may stop suctioning even though meconium is still present in the airway and continue with resuscitation

Meconium Aspirator