



# STABILIZATION OF THE UNEXPECTED NEWBORN

Sara Nitz RRT

Jamie Vinson-Hunter RRT

# OBJECTIVES

Equipment/People  
needed.

Physiologic  
changes after birth

Recognizing which  
babies require  
resuscitation.

Understanding the  
steps to  
resuscitation

The subsequent  
management of  
the resuscitated  
newborn

Need for  
transport?

Simulation

# EPIDEMIOLOGY

United States has one of the highest infant mortality rates if developed countries

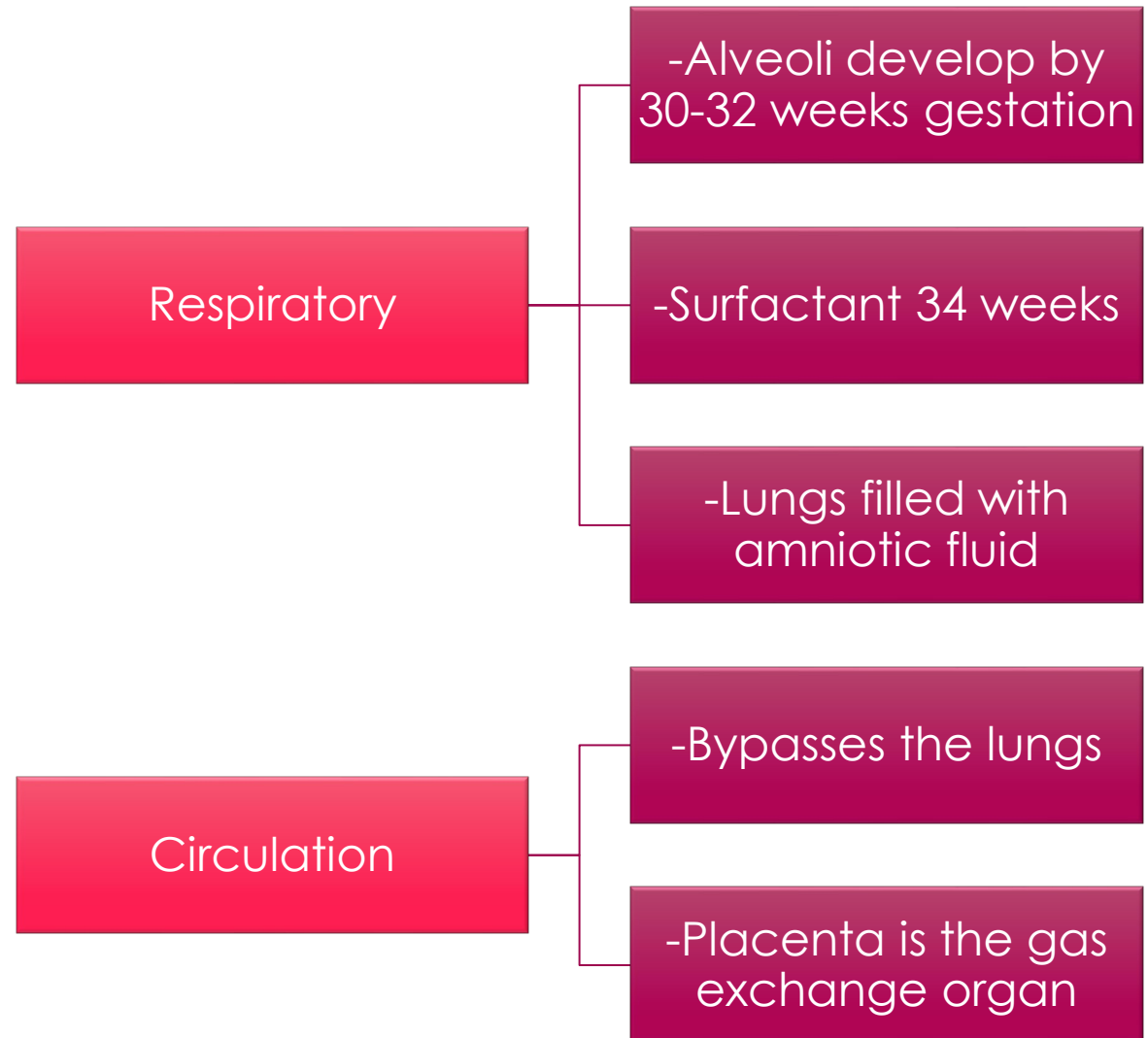
90% of neonates transition without resuscitative needs

10% require assistance

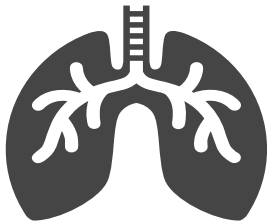
1% require intensive resuscitation

Resuscitative needs very dependent on birth weight

# INTRAUTERINE PHYSIOLOGY



# NEWBORN PHYSIOLOGY



## Respiratory

The first breath: air replaces fluid

Must overcome surface tension in alveoli

Chest wall is very compliant



## Circulation

Umbilical cord is cut

Blood pressure in lungs decreases- blood vessels in lungs relax, decreased resistance allows blood to flow into lungs

Blood pressure in aorta increases- increased systemic vascular resistance

# 4 PREBIRTH QUESTIONS

Expected gestational age?

Is amniotic fluid clear?

Any additional risk factors?

What is our Umbilical cord management plan?

# DELAYED CORD CLAMPING



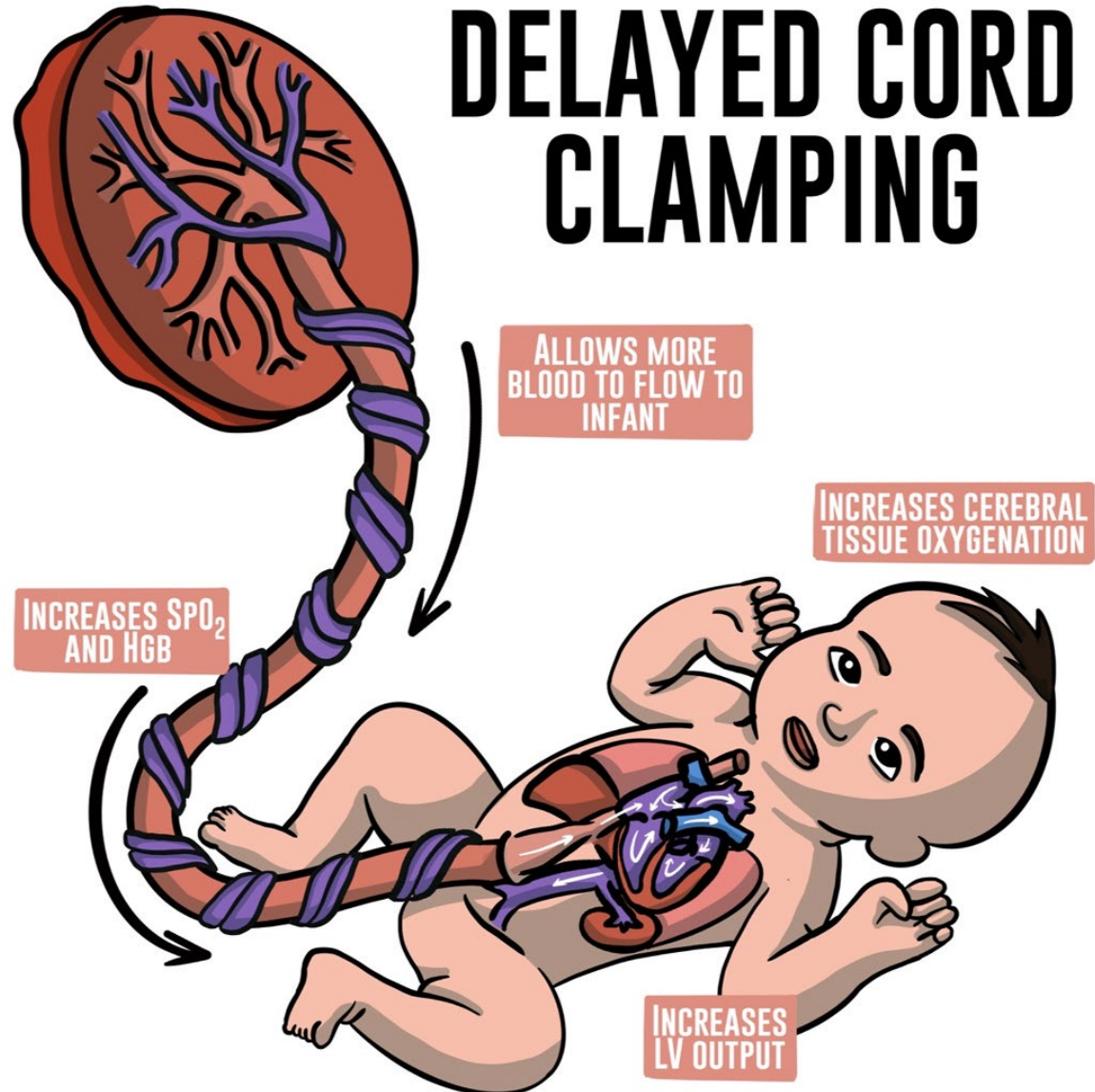
A large volume of blood remains in the umbilical cord and placenta at birth

**75-120ml of fetal blood**



Delaying cord clamping (30-60 seconds) results in an autologous transfusion of baby's blood and a higher circulating blood volume

# DELAYED CORD CLAMPING





# DELAYED CORD CLAMPING IN TERM NEONATE

## Benefits

- Increased Hgb and birth weights
- Decreased risk of developing Iron-deficiency anemia during infancy



# DELAYED CORD CLAMPING IN PRETERM NEONATE

## Benefits

- Fewer post-natal transfusions for anemia
- Higher mean blood pressures and less need for inotropic drugs
- Decreased risk for IVH
- Decreased risk for NEC



- Neonatal Resuscitation Program Quick Pre-resuscitation Checklist

- Preheat Warmer
- Towels or Blankets
- Bulb syringe
- 10F or 12F suction catheter attached to wall suction set at 80-100 mm Hg
- Meconium Aspirator
- Stethoscope
- Pulse oximeter
- Positive-pressure ventilation (PPV) device(s) present with term and preterm masks
- Connected to air/oxygen source (blender)
- 8F feeding tube and 20-mL syringe
- Laryngoscope Size 0 and Size 1 (and size 00, optional) blades with bright light
- Endotracheal tubes, sizes 2.5, 3.0, 3.5, 4.0
- End tidal CO2 detector
- Laryngeal mask airway (size 1) and 5-mL syringe
- Access to 1:10,000 epinephrine and normal saline
- Supplies for administering meds and placing emergency umbilical venous catheter
- Thermoregulate          Plastic bag or plastic wrap
- Chemically activated warming pad
- Transport incubator ready

# WHO SHOULD ATTEND A DELIVERY?

1 qualified person whose only responsibility is the management of the newborn

However, If high risk:

- A qualified team with full resuscitation skills, including intubation, chest compressions, emergency vascular access, and medication administration, should be identified and immediately available for every resuscitation



# RISK FACTORS FOR REQUIRING RESUSCITATION

- Gestational age
- No prenatal care
- Drug abuse
- Known fetal or genetic abnormalities
- Gestational diabetes
- Preeclampsia
- Maternal fever
- Multiple gestation
- Precipitous labor

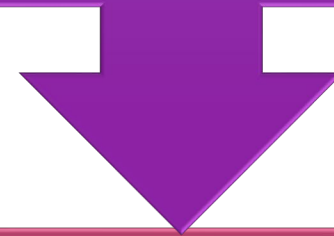
# APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	↓
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

# NEWBORN RESUSCITATION

Warm, suction, dry and  
stimulate



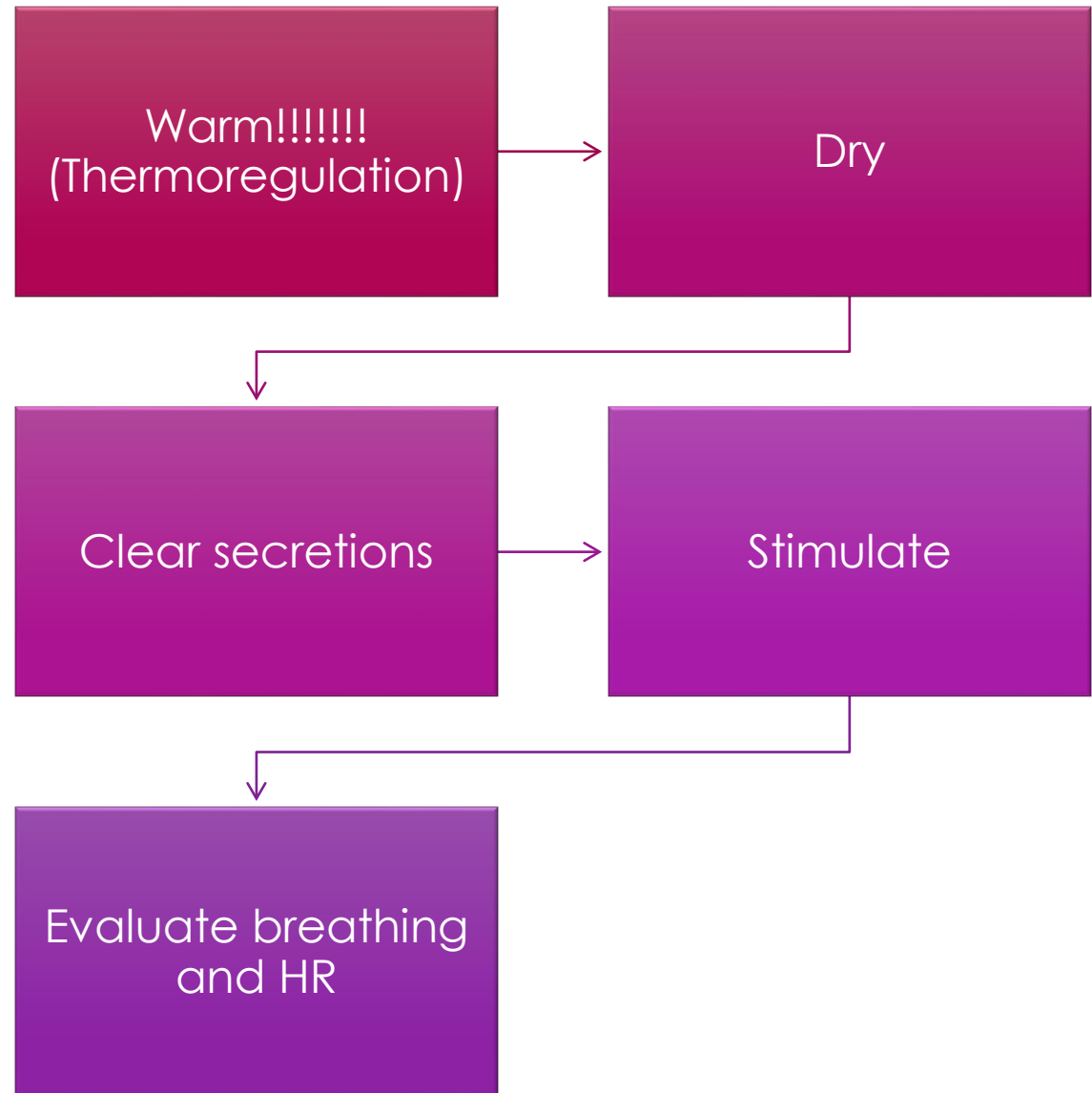
Further interventions:

Breathing

Circulation

Drugs

# INITIAL STEPS



## THERMOREGULATION

---

Normal ranges 97.7F-98.6F

---

Results of cold stress accelerates O<sub>2</sub> consumption and the use of glucose stores.

---

Use of radiant heat is extremely important

---

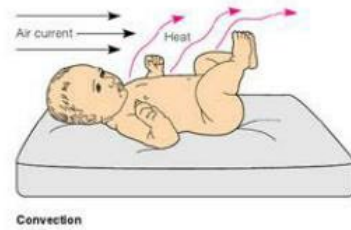
Plastic bag to place or wrap extremely premature babies in

---

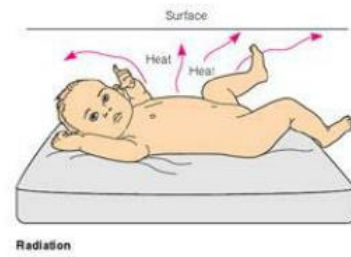
Heated mattress for 32wks and below



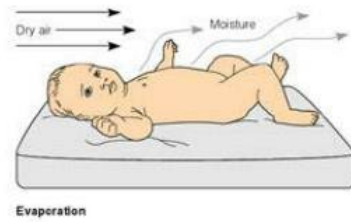
Convection



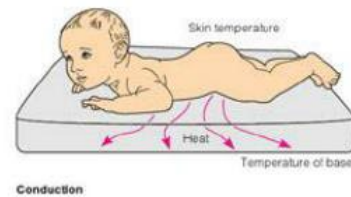
Radiation



Evaporation



Conduction



# RESUSCITATION

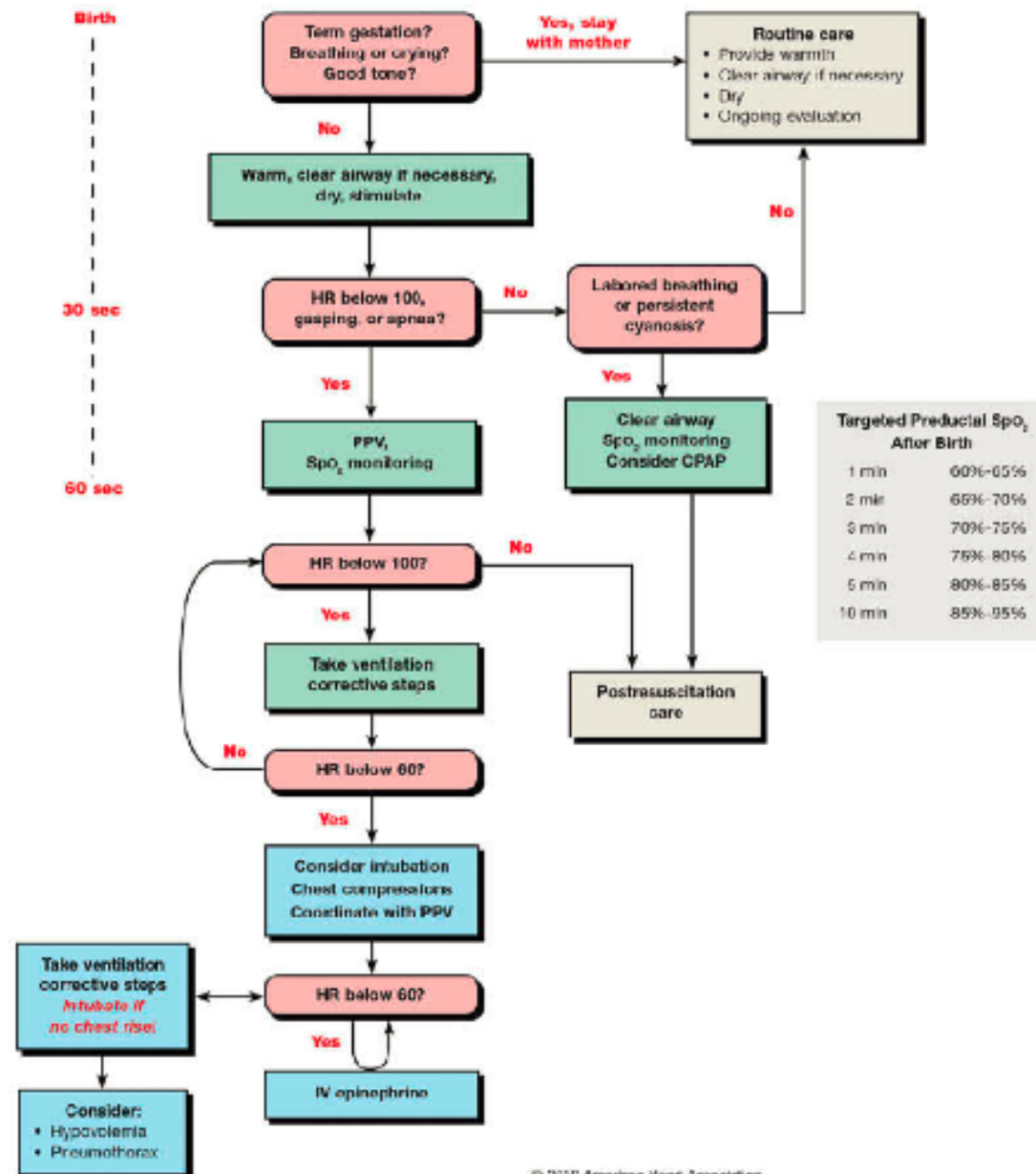
3 basic steps of resuscitation

Positive pressure ventilation (PPV)

Chest compressions

Drug administration

## Newborn Resuscitation



# PPV

- Indications:

Apnea

Gasping

HR<100

Hypoxia despite supplemental oxygen

# PPV

---

Use correct mask and bag size

---

Administer breaths at 40-60 breaths per minute

---

Effective resuscitation should be evident by rising HR

---

M Mask Adjustment

---

R Reposition Airway

---

S Suction mouth and nose

---

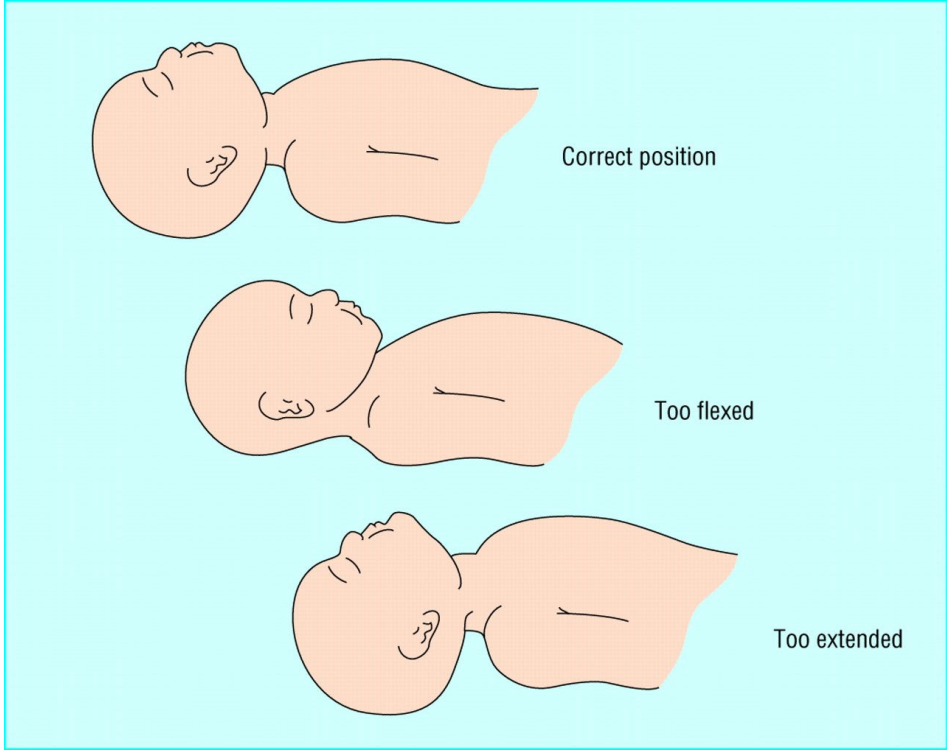
O Open Mouth

---

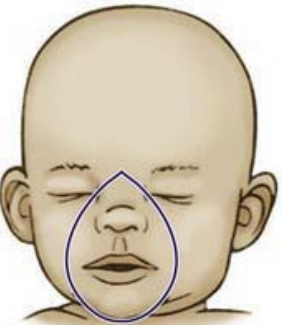
P Pressure Increase

---

A Alternate Airway



**Correct**  
Covers mouth, nose, and chin but not eyes



**Incorrect**  
Too large: covers eyes and extends over chin



**Incorrect**  
Too small: does not cover nose and mouth well

# CIRCULATION

- If infant condition does not improve or HR < 60 bpm after 30 sec of effective PPV
  - Begin chest compressions ( 2 thumb technique)
  - Increase O<sub>2</sub> concentration to 100%
  - Consider intubation

## Indications for intubation:

- Prolonged depressed respirations
- Prolonged bradycardia
- PPV not improving HR or moving the chest well
- Suspected diaphragmatic hernia
- The start of chest compressions

# AIRWAY





# DRUGS

Epinephrine

After 1 min of CPR if HR still  $< 60$

Repeat every 3-5 seconds

Use umbilical vein catheter or ETT

May use volume expander if needed



# POST RESUSCITATION CARE

S Sugar

T Temperature

A Artificial breathing

B Blood pressure

L Labs

E Emotional support for the family

Transport????