WHY LEARN RESUSCITATION

• Birth asphyxia - 19% (5 million) of all neonatal deaths every year (WHO 1995)

• By appropriate resuscitation: Outcome of thousands of newborns may improve

• 10% of all babies require resuscitation; 1% need extensive resuscitative measures
ABCS OF RESUSCITATION

Temperature

Airway (position and clear)

Breathing (stimulate to breathe)

Circulation (assess heart rate and color)

Drugs (Medications)
Need For Resuscitation

Assess baby’s risk for requiring resuscitation
Provide Warmth
Position, Clear airway, Dry, stimulate to breathe
Give Supplemental Oxygen, as necessary
Assist ventilation with positive pressure
Intubate the trachea
Provide chest compressions
Administer medications

Always needed by newborns

Needed less frequently

Rarely needed by newborns
FLUID FILLED ALVEOLI AND CONSTRICTED BLOOD VESSELS IN THE LUNGS BEFORE BIRTH

Constricted vessels before birth

Fluid in alveoli
SHUNTING OF BLOOD THRU DUCTUS AWAY FROM LUNGS BEFORE BIRTH
WHAT NORMALLY HAPPENS AT BIRTH

Three major changes occur

• The Fluid in the alveoli is absorbed

• The umbilical arteries and vein constrict and are clamped
  ▪ Removes low-resistance placental circuit
  ▪ Increase systemic blood pressure

• Blood vessels in the lung tissue relax
  ▪ Decrease resistance to blood flow
Fluid in the alveoli absorbed and replaced by air
Constricted vessels before birth

Dilated vessels after birth

Fluid in alveoli

Oxygen in alveoli

Dilatation of Pulmonary Blood vessels at Birth
CESSATION OF SHUNT THRU DUCTUS AFTER BIRTH AS BLOOD PREFERENTIALLY FLOWS THROUGH LUNGS

Closing ductus arteriosus

Oxygen-enriched blood in aorta

Pulmonary artery

Lung

Lung
WHAT CAN GO WRONG DURING TRANSITION?

• Breaths not forceful to remove alveolar fluid
  or

• Foreign material blocks air entry oxygen not available

• Excessive blood loss/poor cardiac contractility systemic hypotension

• Hypoxia constriction of pulmonary arterioles tissue oxygen deprivation (PPHN)
RESPONSE OF THE BABY TO AN INTERRUPTION IN NORMAL TRANSITION

• Poor muscle tone due to insufficient oxygen supply to brain, muscles and other organs

• Depression of respiratory drive from insufficient oxygen supply to the brain

• Bradycardia
  ▪ Insufficient delivery of oxygen to heart, muscle or brain stem

• Low Blood pressure
  ▪ Poor myocardial contractility or blood loss

• Tachypnea from failure to absorb lung fluid

• Cyanosis from insufficient oxygen in blood
KEY PRINCIPLES

Anticipate

• At every delivery - at least 1 person whose primary responsibility is the newborn
• Either that person or someone readily available - skills to perform a complete resuscitation
• If need for resuscitation is anticipated - additional skilled personnel and necessary equipment
INITIAL STEPS

Birth

Term gestation? Breathing or crying? Good tone?

Yes, stay with mother

Routine care
- Provide warmth
- Clear airway if necessary
- Dry
- Ongoing evaluation

30 Sec

60 Sec
INITIAL STEPS

Birth

Term gestation?  
Breathing or crying?  
Good tone?

Yes, stay with mother

Routine care
• Provide warmth
• Clear airway if necessary
• Dry
• Ongoing evaluation

No

Warm, clear airway if necessary, dry, stimulate

30 Sec

60 Sec
Provide warmth...

Place under the warmer!
Clear airways

Position – ‘Sniffing’
Clear airways: suction

First mouth, then nose
Dry, stimulate

Dry thoroughly

Remove wet linen
Dry, stimulate
Assessment of oxygen need: Pulse-oximetry

• Goal: Achieve oxygen saturation in the IQR of pre-ductal saturations (both term & pre-term)
Administration of oxygen

• Achieve targets by either initiating resuscitation:
  ▪ With room air (preferred in term infants)
  ▪ With blended O2 & titrating as necessary (in PT)

• If blended oxygen unavailable, initiate resuscitation with room air

• Increase O2 to 100% if persistently bradycardic (<60 bpm) after 90 seconds of resuscitation with a lower FiO2
INDICATIONS OF BAG & MASK VENTILATION

After 30 seconds of Initial steps if (any):

• Baby is not breathing or is gasping

• Heart rate is less than 100 bpm

• Is Cyanotic despite supplemental oxygen
DIFFERENT TYPES OF RESUSCITATION DEVICES

**Flow inflating bags**
Fills only when oxygen from a compressed source flows in to it

**Self inflating bags**
Fills spontaneously after it is squeezed, pulling oxygen or air in to the bag

**T-piece resuscitator**
Also works when gas from compressed source flows into it. The gas is directed into the baby by occluding the opening on T-piece
FLOW INFLATING BAGS

Oxygen

Flow-control valve
SELF INFLATING BAGS
T-PIECE RESUSCITATOR

- Maximum Pressure Relief
- Gas Inlet
- Gas Outlet
- Inspiratory Pressure Control
- Circuit Pressure
- PEEP Adjustment
- Inspiratory Pressure Relief
- Gas Outlet
FREQUENCY OF BM VENTILATION

40 – 60 breaths per day

Breath ----- two -----three ----- Breath

Squeeze Release ------------------- Squeeze
FREQUENCY OF PPV
SIGNS OF EFFECTIVE POSITIVE-PRESSURE VENTILATION

• Rapid rise in heart rate

• Improvement in oxygenation

• Improving muscle tone

• Audible breath sound

• Chest movement
# Improving Efficacy of PPV

<table>
<thead>
<tr>
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<th>Actions</th>
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<tbody>
<tr>
<td>M</td>
<td>Adjust <strong>Mask</strong> to assure good seal on the face</td>
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<tr>
<td>R</td>
<td><strong>Reposition</strong> airway by adjusting head to “sniffing”</td>
</tr>
<tr>
<td></td>
<td>position</td>
</tr>
<tr>
<td>S</td>
<td><strong>Suction</strong> mouth and nose of secretions, if present</td>
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<tr>
<td>O</td>
<td><strong>Open</strong> mouth slightly and move jaw forward</td>
</tr>
<tr>
<td>P</td>
<td>Increase <strong>Pressure</strong> to achieve chest rise</td>
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<tr>
<td>A</td>
<td>Consider <strong>Airway</strong> alternative (endotracheal intubation</td>
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<td>or laryngeal mask airway)</td>
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CHEST COMPRESSIONS

- Heart rate less than 60 BPM despite 30 sec of effective positive-pressure ventilation
WHEN TO USE MEDICATIONS

• Despite Administration of effective chest compressions and effective positive-pressure ventilation with 100% oxygen:

  • Heart Rate is below 60 bpm
RHYTHM OF CHEST COMPRESSION?

• Coordinate with IPPR
• One ventilation interposed after every 3rd compression
• Total of 120 events (30 breaths + 90 compressions)

Person 1: (chest compression)

Person 2: (Positive-pressure ventilation)

--- 2 Seconds (one cycle).---
EPINEPHRINE HYDROCHLORIDE

• Cardiac stimulant
  - Increases strength & rate of cardiac contractions
  - Causes peripheral vasoconstriction

• It is indicated when HR remains < 60 after 30 sec of effective PPV and another 30 sec of coordinated chest compressions and ventilation
VOLUME EXPANDER

- Poor response to resuscitation
- Evidence of blood loss
- Pale
- Poor pulses
- CFT
THANKS