Neonatal Resuscitation

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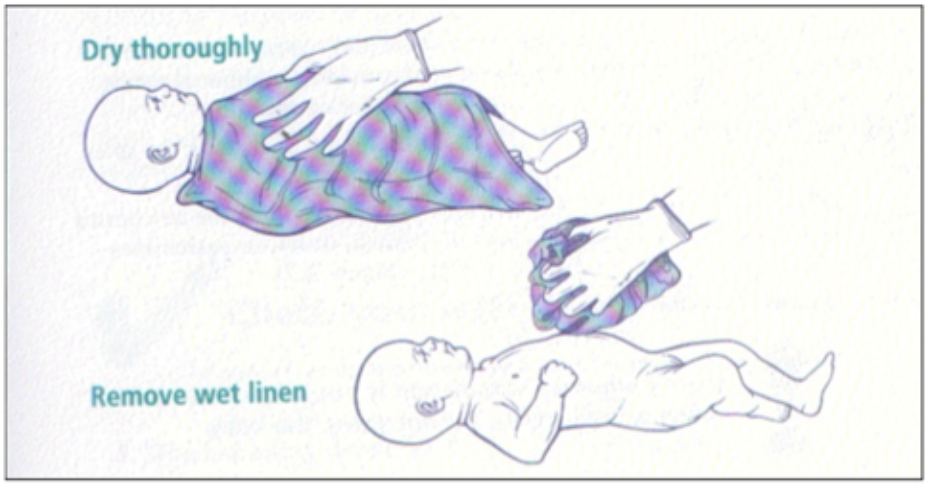
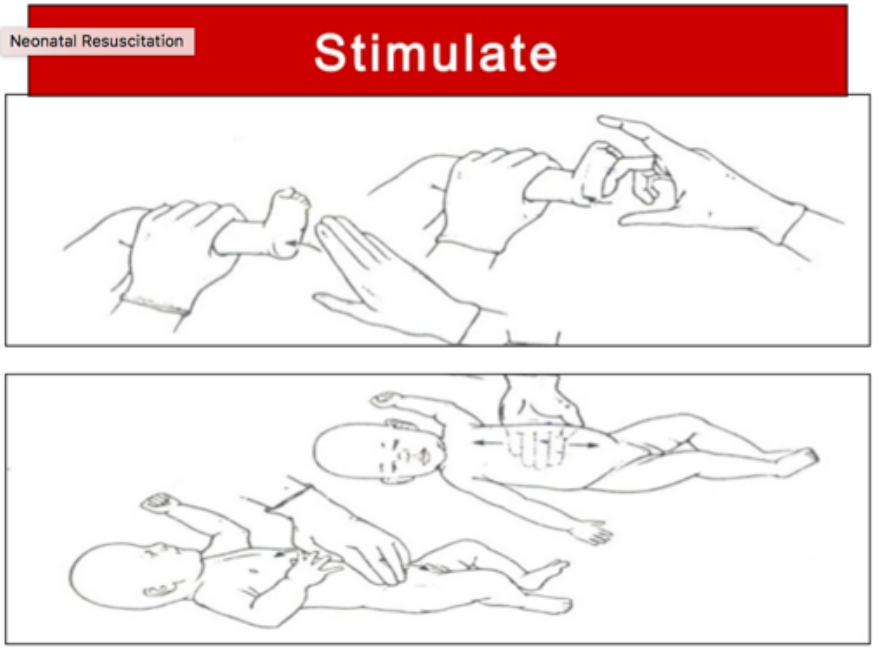
With SAMS
For all Syrians

Newborns - Management

Dry & Remove wet linen



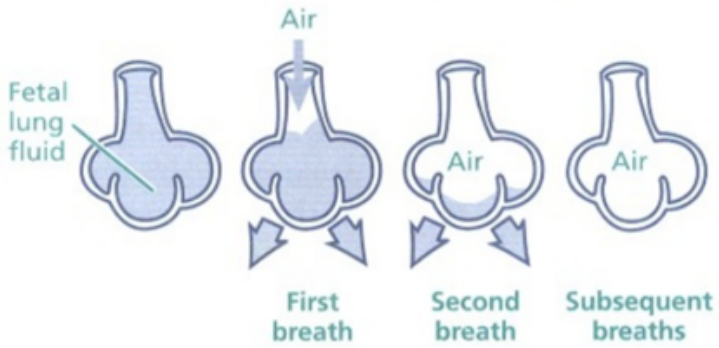
Stimulate



WHY do they need help?

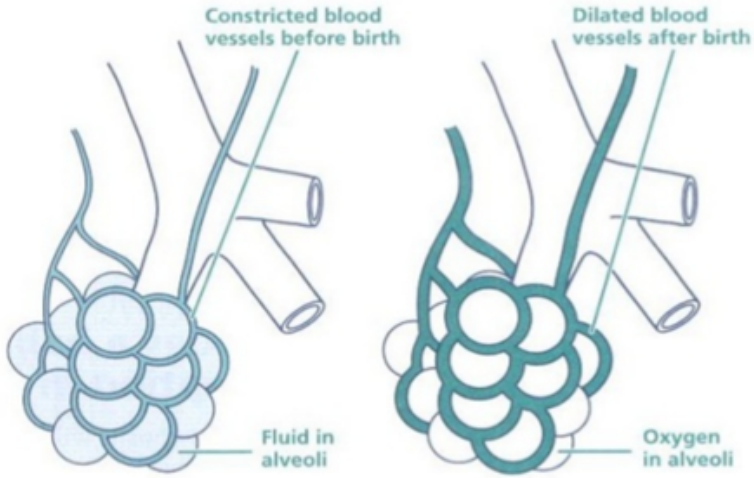
After birth

1. **Fluid in the alveoli is absorbed** → **Alveoli**
   - **Expand**
   - **Get filled with Air**



Pulmonary vessels dilate, causing increased blood flow to lungs

2.



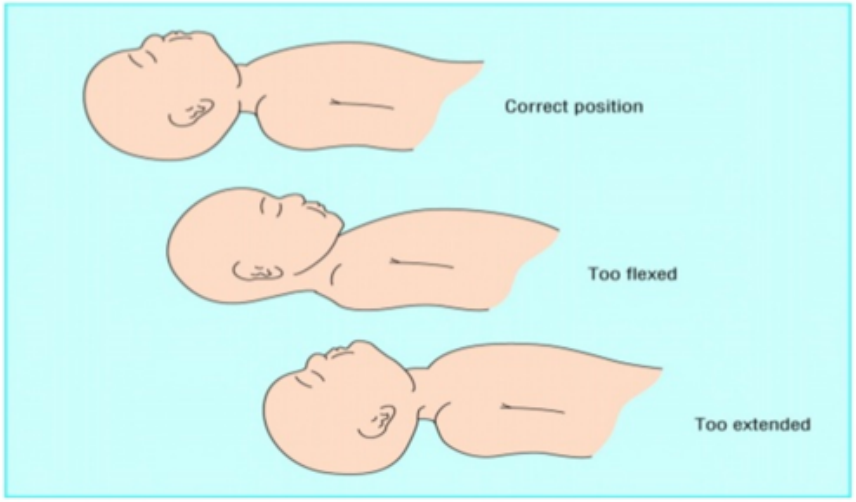
Respiratory distress

is present if baby has at least two of:

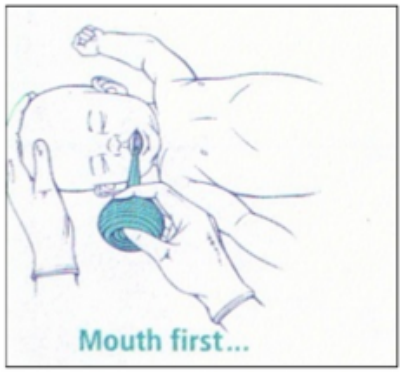
1. Respiratory rate > 60/min
2. Rib in-drawing
3. Grunting
4. Nasal flaring
5. Cyanosis.
6. Head bobbing

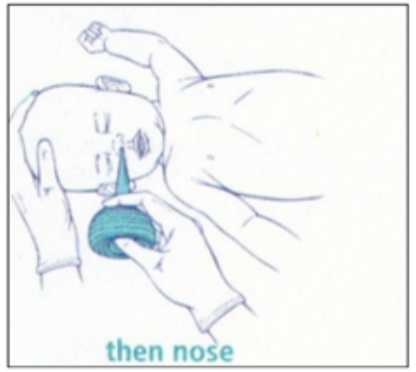
Mx of Newborns: Warmth = essential

Positioning



Clear airways (if necessary)





Indications for Bag and Mask

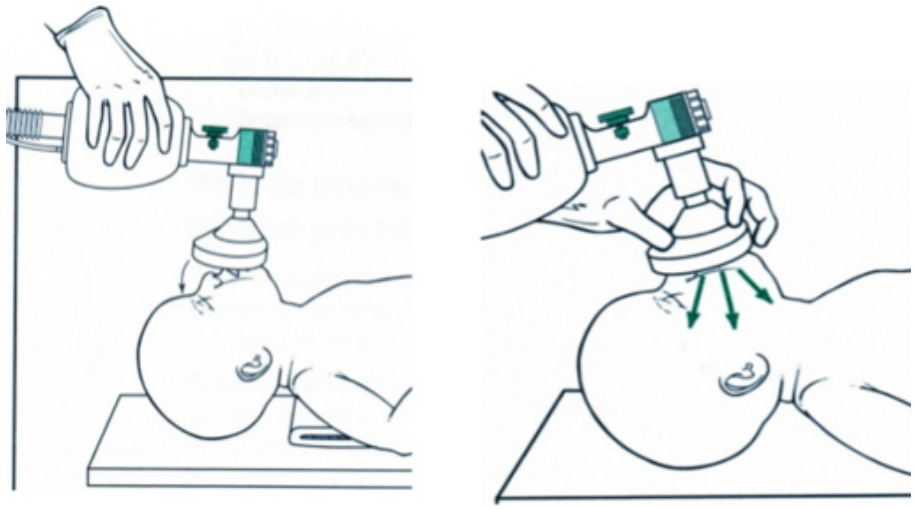
- Apnea
- HR < 100
- Saturation:

Time after birth (minutes)	(Preductal) Oxygen Saturation (%)
1	60-65
2	65-70
3	70-75
4	75-80
5	80-85
6	85-95

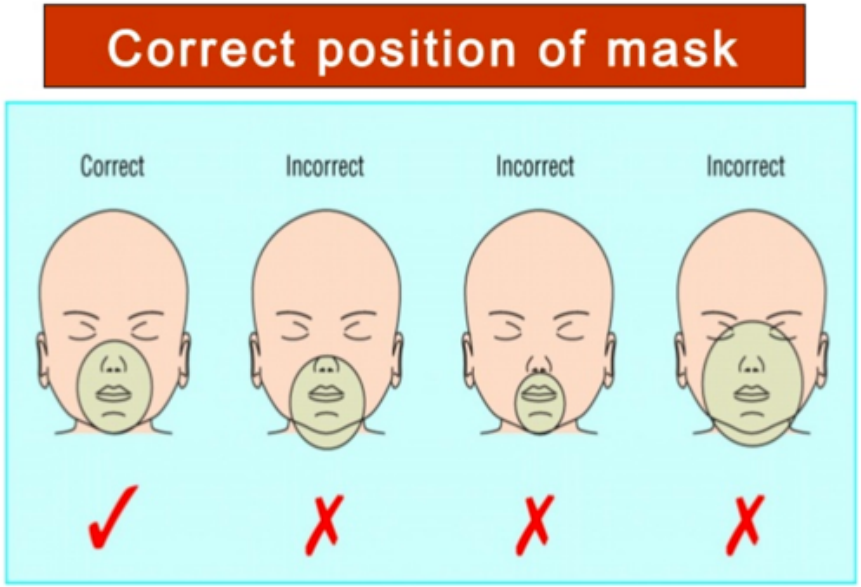
Correct position→ success

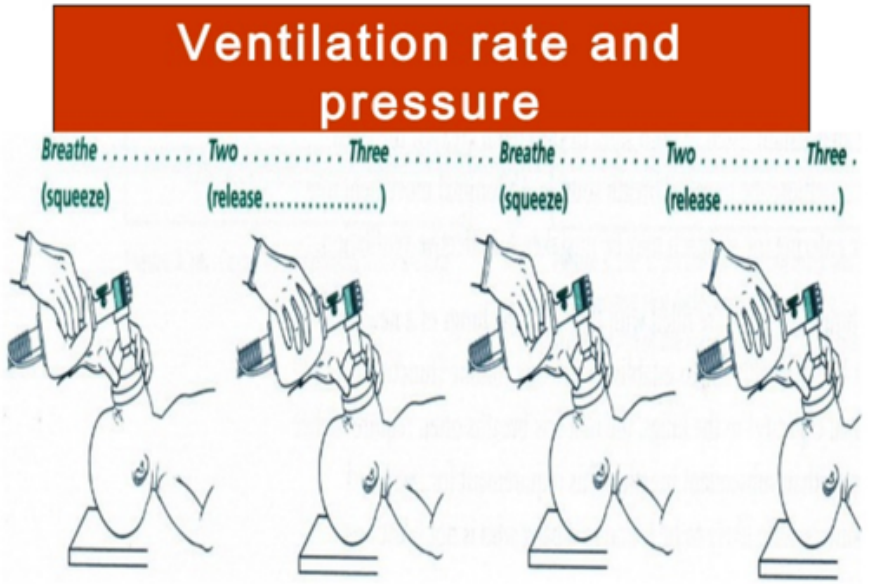
- **Position**
  - Neck slightly extended with firm support for the back
  - Lower 1/3rd of sternum between nipple line & sternum
- **Pressure required – depth**
  - 1/3rd of the AP diameter of chest
- **Rate**
  - 90/min

Forming & checking the seal



Check position mask, watch chest, Count





Signs of Effective Ventilation

Sign of response to ventilation:

- Improved heart rate

Signs of improvement in newborn:

- Improved heart rate, color, breathing, tone, and saturation

No improvement? Is chest moving?

- **M- Adjust Mask on the face**
- **R- Reposition the head to open airway**
  - Re-attempt to ventilate…if not effective then
- **S- Suction mouth then nose**
- **O- Open mouth and lift jaw forward**
  - Re-attempt to ventilate…if not effective then
- **P- Gradually increase Pressure every few breaths unti visible chest rise is noted**
  - **Max Pip 40cmH2O** If still not effective then…
- **A- Alternative Airway (ETT or LMA)**

CPR

Indications

If after 30 seconds of ***EFFECTIVE*** bag and mask ventilation with 100% oxygen,

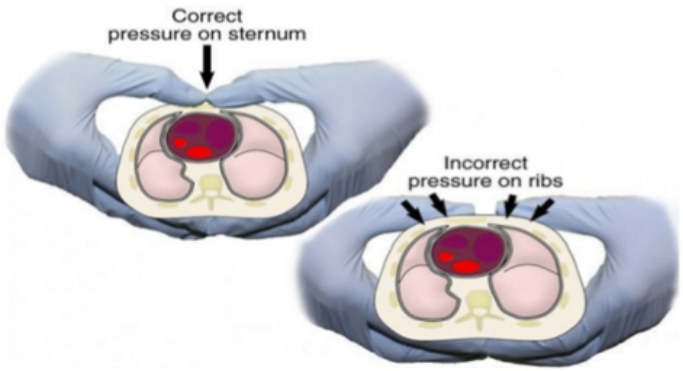
Heart Rate is below 60 per minute

Techniques of Chest Compressions

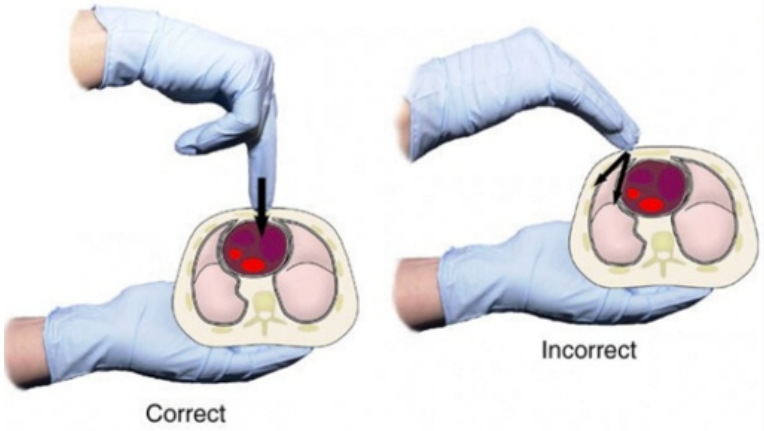
Thumb method

Two-finger method

Thumb Technique



2 Finger Technique



Preferred method - Thumb

- Advantages
  - Better control of depth
  - Less tiring
  - Superior generation of peak systolic & coronary perfusion pressure
  - Nails do not hinder performance
- Disadvantages
  - Difficult when baby is big
  - Umbilicus difficult to canulate

Rate and Adequacy

Rate

- 3 Chest Compressions then 1 ventilation
- 90 Chest Compressions to 30 ventilations in one minute

ONE- AND – TWO – AND – THREE – AND - BREATH

Evaluation after 30 sec of CC & BMV

- HR 60 per minute or more Stop CC, continue BMV at 40-60/min
- **If no improvement, check :**
  - Effectiveness of BMV
  - Oxygen is 100%
  - Technique of CC is correct

When to stop chest compressions

- When heart rate is 60 per minute or more

If no improvement,
give 0.1 1ml/kg
Adrenaline 1:10,000
via ETT or IV

Indications for intubation

Non-responsive / ineffective ventilation
Meconium aspiration
Birth asphyxia
VLBW

Intubation: Rapid Sequence Induction

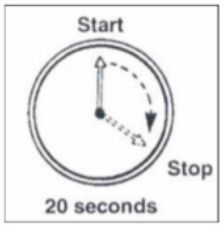
Morphine 100microg/kg IV

Atropine 20microg/kg IV

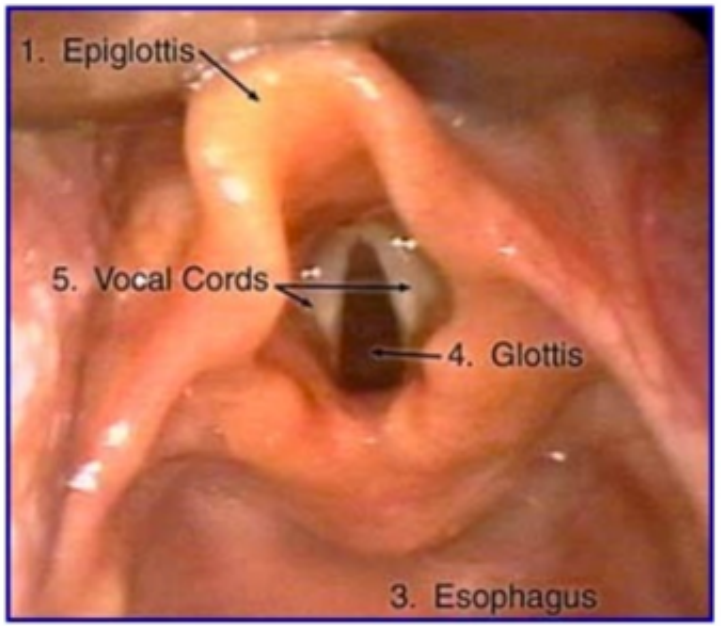
Suxamethonium 1-2mg/kg IV

Minimizing hypoxia during intubation

- Providing free-flow oxygen (Assistant's responsibility)
- Limiting each intubation attempt to **20 seconds**



Intubation view



EQUIPMENT for Intubation

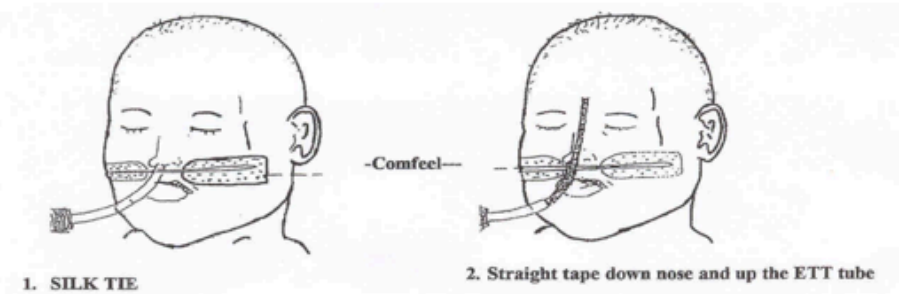
- Endotracheal tube (see Table 1).
- Laryngoscope – size appropriate.
- Magill forceps.
- Scissors.
- Introducer
- Hydrocolloid tape (Comfeel) x 2.
- Skin preparation wipe.
- Brown skin tape (leucoplast) 2.5 cms wide
- 2 lengths cut into trouser legs (oral)
- 2 lengths cut into trouser legs/1 length cut in half lengthwise (nasal)
- Size 6 suction catheter (for nasal intubation)
- Black silk tie (nasal)
- Cotton buds (nasal)

Nasal Intubation for Neonates & Infants

Table 1: Tracheal Tube Size Guide

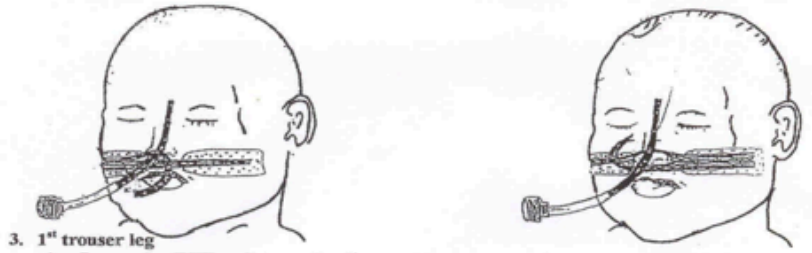
WEIGHT	TUBE SIZE	POSITION AT NOSTRIL
< 700 grams	2.0 mm - 2.5 mm	6 cm
<1000 grams	2.5 mm - 3.0 mm	7 cm
1000 grams	3.0 mm - 3.5 mm	7.5cm
2000 grams	3.0 mm - 3.5 mm	9 cm
3000 grams	3.0 mm - 3.5 mm	10.5 cm
3500 grams	3.5 mm - 4.0 mm	11 cm

Securing Nasal ETT



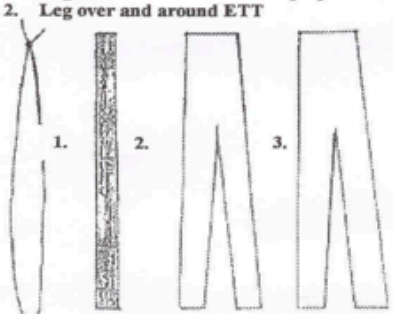
1. SILK TIE

2. Straight tape down nose and up the ETT tube



3. 1st trouser leg
   1. Leg under ETT and across top lip
   2. Leg over and around ETT

4. 2nd trouser leg on opposite cheek
   1. Leg across nose
   2. Leg under and around ETT



NB Ensure other nostril is not occluded

Ventilation: Principles (1)

Start & Settings

- PIP or Tidal vol (V_T) → watch chest move.
- V_T : 8-10 ml/ kg*
- ABG @ 15 mins
- Pressure-controlled* if < 15 kg
- Triggered Ventilation:
  - more comfortable than IMV
  - uses lower airway pressures & lower V_T
- I time 0.2, 0.3-0.5

*Pressure-controlled always easiest

Rate (breaths/min)

• Neonate	30-40
• 6/12 infant	25-30
• 1 -5 years:	20-25
• 5-12 years	15-20
• >12	12-15

Ventilation: Principles (2) Less is More!

- Minimum flow rate: 2-3L/kg*/min
- Headbox O_2: gas flow 2-3L/kg*/min
- Nasopharyngeal Oxygen: Insert distance Ala nasi→ tragus;150ml/kg*/min delivers ~50% oxygen

*estimated weight

- Lung disease, no brain injury: use controlled hypoventilation, aim FiO_2 < 0.5 to avoid VILI
- Neonates & infants: good lung up for better gas exchange (opposite in adults – dependent)

Neonatal Ventilation: Ventilator set up

	IMV	SIMV	A/C	Pressure-Control
Inspiratory time I_T	0.2-0.5	0.2-0.5	0.2-0.5	Set time 0.3-0.5
Respiratory rate RR	Set based on condition	Set based on condition	Set lower limit for apnea	Set lower limit for apnea
Peak Insp Pressure PIP	Set based on condition V_T	Set based on condition V_T	Set limit based on V_T	Set limit based on V_T
PEEP	4-10	4-10	4-10	4-10
Tidal volume V_T	4-8ml/kg	4-8ml/kg	4-8ml/kg	4-8ml/kg
Flow	3-15 L/min	3-15 L/min	3-15 L/min	3-15 L/min
FiO_2	Adjust according to O_2 sats	Adjust acc to O_2 sats	Adjust acc to O_2 sats	Adjust acc to O_2 sats

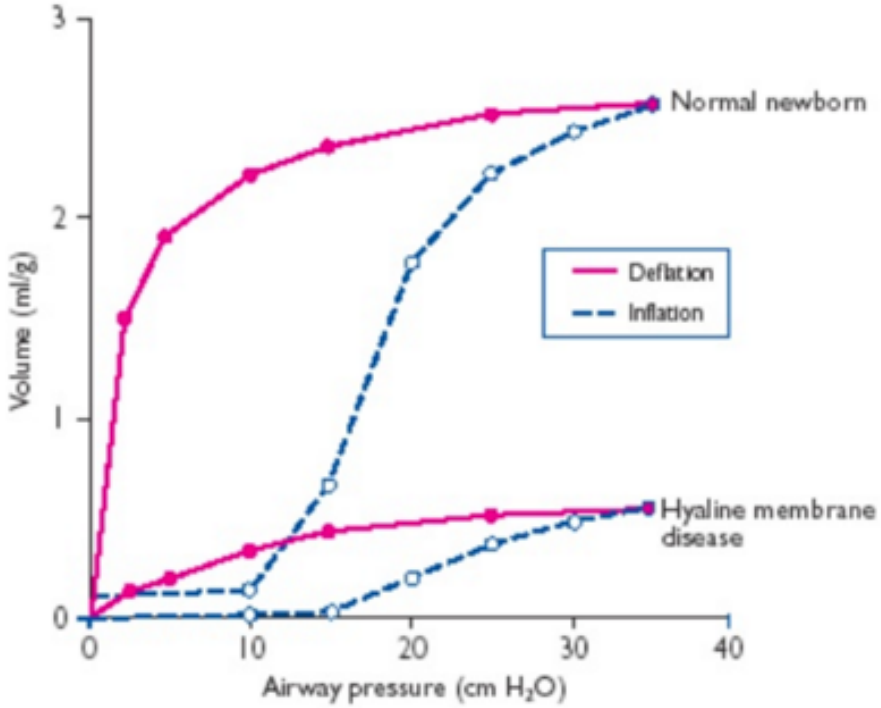
Respiratory distress syndrome (RDS)

- RDS (hyaline membrane disease, surfactant deficiency).
- ↑ risk w/pre-term delivery, asphyxia, maternal diabetes, C/Section & APH.

<u>Treatment:</u>

- oxygen
- surfactant
- ampicillin and gentamycin: RDS cannot be reliably distinguished from neonatal pneumonia.

Compliance


Normal newborn
Deflation
Inflation
Hyaline membrane disease
Volume (ml/g)
Airway pressure (cm H_2O)
0
1
2
3
0
10
20
30
40

Weaning

A. Infants intubated < 3 days: extubate from a rate of 6-10, should not have a period of endotracheal CPAP before extubation
B. Infants intubated > 3 days: extubate to nasal CPAP

1. Rapid reduction IMV rate to 5/min (NOT gradual reduction)
2. Wean I-time to <50%
3. Wean PEEP to <3-5cm H_2O
4. Wean FiO_2 to <40%
5. Extubate when spontaneous breathing from rate 5/min

RDS Management

1. Nasopharyngeal oxygen use 5 or 8 FG feeding tube: measure anterior nares to tragus of the ear & insert end of tube this distance. Start at a flow rate of 0.25 litre/min + increase to maximum 0.5 l/min.

   GIVE ONLY ENOUGH OXYGEN TO KEEP THE BABY PINK.

2. Check glucose: give 5 ml/kg IV dextrose if less than 2.5 mmol/l

   If suspect hypoglycaemia but no dextrostix, give bolus of 5 ml/kg 10% dextrose IV.

3. Antibiotics: Always give ampicillin (or amoxycillin) + gentamicin for ⩾ 5 days.

4. Fluids: IV fluids if the baby is sick enough to require oxygen.

   Nasogastric feeds can be gradually introduced as resp distress improves.

5. CXR: exclude pneumothorax, diaphragmatic hernia.

6. Other treatment. Give digoxin if there is cardiac failure. Consider giving indomethacin if there is a PDA