

# Chapter 10

## RESPIRATORY DISTRESS IN NEWBORN

Respiratory distress accounts for significant morbidity and mortality in neonates. It occurs in 4 to 6 percent of neonates. Many of the conditions causing respiratory distress are preventable. Early recognition and prompt management are required

### Learning objectives

After completion of this module the participant should be able to-

- Diagnose common causes of respiratory distress in Term and Preterm newborns
- Identify babies with respiratory distress and assess severity of respiratory distress
- Deliver oxygen and manage babies with respiratory distress
- Monitor babies on oxygen therapy

### Common causes of respiratory distress

#### Preterm baby

- Respiratory distress syndrome
- Congenital Pneumonia
- Miscellaneous causes: hypothermia, hypoglycemia

#### Term baby

- Transient tachypnea of newborn (TTNB)
- Meconium aspiration
- Pneumonia,
- Asphyxia

### Surgical causes

- Diaphragmatic hernia
- Tracheo-esophageal fistula
- B/L choanal atresia

### Other causes

- Cardiac
- Metabolic

## Approach to respiratory distress

**History** A detailed relevant antenatal and perinatal history should be taken based on the common causes:

- Gestation
- Onset of distress
- Previous preterm babies with respiratory distress
- Antenatal steroid prophylaxis if preterm delivery
- Rupture of Membranes > 24 hours, Intrapartum fever, chorioamnionitis
- Meconium stained amniotic fluid
- Asphyxia
- Maternal diabetes mellitus

## Examination

- Severity of respiratory distress
- Neurological status
- CFT
- Hepatomegaly
- Cyanosis
- Features of sepsis
- Look for malformations

## Assessment of severity of respiratory distress

**Table 10.1: Silverman Anderson Score and its interpretation**

Score	Upper chest retraction	Lower chest retraction	Xiphoid retraction	Nasal flaring	Grunt
0	Synchronised	None	None	None	None
1	Lag during inspiration	Just visible	Just visible	Minimal	Audible with Stethoscope
2	See-Saw	Marked	Marked	Marked	Audible with unaided ear

## Interpretation

**Score 0-3 = Mild respiratory distress – O<sub>2</sub> by hood**

**Score 4-6 = Moderate respiratory distress - CPAP**

**Score > 6 = Impending respiratory failure**

**Table 10.2 : Downe's score and its interpretation**

Score	Respiratory rate	Cyanosis	Air entry	Grunt	Retraction
0	<60/min	Nil	Normal	None	Nil
1	60-80/min	In room air	Mild decrease	Audible with Stethoscope	Mild
2	>80/min	In >40% FiO <sub>2</sub>	Marked decrease	Audible with unaided ear	Moderate

### Interpretation

Score <6 = Respiratory distress

Score > 6 = Impending respiratory failure

### Investigations

The diagnosis is based on the x-ray findings and the sepsis screen.

### Chest X-ray

To look for

- Respiratory Distress Syndrome (RDS) - Air bronchogram, decreased lung volume and hazy lungs
- Meconium Aspiration Syndrome (MAS) - Fluffy shadows involving both lungs with hyperinflation
- Pneumonia - Infiltrates
- Pulmonary hemorrhage, RDS - White out (Opaque lung)

**Sepsis screen : TLC, DLC, CRP, Micro ESR, IT Ratio, ANC**

**Blood Culture:** This may give a clue to the infectious etiology of the respiratory distress

### Management

#### General management

- Give oxygen with oxygen hood or nasal cannula to achieve appropriate oxygen saturation
- Maintain normal body temperature (see section on hypothermia)
- Give IV fluids if the baby does not accept feeds or has severe respiratory distress
- Maintain blood glucose, if low treat hypoglycemia
- If baby has apnea
  - a. Stimulate to breathe by rubbing the back or flicking the sole
  - b. If does not begin to breathe immediately provide positive-pressure ventilation with bag and mask
  - c. Aminophylline if baby is preterm

- d. If recurrent apneic spells, treat for sepsis and organize transfer to a specialized centre for assisted ventilation.

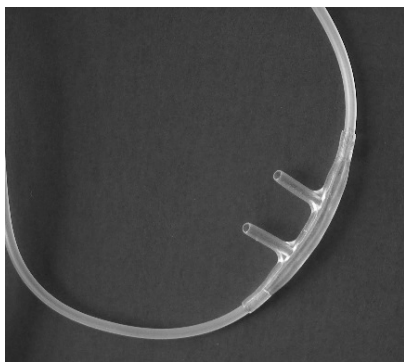
**Specific management**

**Moderate to Severe breathing difficulty**

- Monitor and record the baby’s respiratory rate, presence of chest indrawing or grunting on expiration, and episodes of apnoea every hour until the baby no longer requires oxygen and then for an additional 24 hours.
- Monitor the baby’s response to oxygen by oxygen saturations.
- Insert an oro-gastric tube to empty the stomach of air and secretions.
- After taking a sepsis screen including blood culture start antibiotics.
- When the baby begins to show signs of improvement:
  - Give expressed breast milk by oro-gastric tube
  - Allow the baby to begin breastfeeding as the respiratory distress settles. Baby can be put on to breast while on oxygen by nasal cannula with continuous monitoring.
  - If the **baby cannot be breastfed**, give expressed breast milk using a cup & spoon or paladai.

<b>TABLE 10.3: Methods for administering oxygen</b>		
<b>Method</b>	<b>Nasal catheter</b>	<b>Head box</b>
<b>Flow</b>	• Low = 0.5 L per minute	• Low = 3 L per minute
	• Moderate = 0.5 to 1 L per min	• Moderate = 3 to 5 L per min
	• High = more than 1 L per min	• High = more than 5 L per min

**Nasal Prongs :**



These are a useful means of delivering oxygen. Appropriate size prongs, which fit the neonate well, should be used. If a large size of the nasal cannula is used, it may cause blanching of the ala nasi and injure the nose.

## Nasal Catheter

- Use a 6-8 french catheter.
- Determine the distance the tube should be passed by measuring the distance from the nostril to the inner margin of the eyebrow.
- Gently insert the catheter into the nostril.
- Ensure that the catheter is correctly positioned.
  - Look into the baby's mouth;
  - The catheter should not be visible at the back of the mouth;
  - If the catheter is visible at the back of the mouth, pull the catheter out slowly until it is no longer visible.
- Adjust the flow of oxygen to achieve the desired oxygen saturation.
- Change the nasal catheter twice daily. Give oxygen using a face mask while changing the catheter if necessary.

## Head Box

- Place a head box over the baby's head.
  - Ensure that the baby's head stays within the head box, even when the baby moves.
  - Adjust the flow of oxygen to achieve the desired oxygen saturation.
- If the baby's breathing difficulty worsens or the baby is desaturating or has central cyanosis:
- Give oxygen at a high flow rate
  - If breathing difficulty is so severe that the baby has central cyanosis even in 100% oxygen, organize transfer and urgently refer the baby to a tertiary hospital or specialized centre capable of assisted ventilation.

If investigations reveal evidence of sepsis, stop antibiotics after 7 – 10 day and observe the baby for 24 hours after discontinuing antibiotics.

If the baby's oxygen saturation on pulse oximetry are acceptable, gradually wean from oxygen. If the baby has no difficulty breathing and is feeding well, discharge the baby.

<b>Pulse oximetry</b> : Maintain a saturation of 88 – 92% in preterm and 90-93 % in term neonates
---

### **Mild breathing difficulty**

- Monitor for respiratory distress and oxygen saturation. Give oxygen if needed.
- Give expressed breast milk by gastric tube
- When oxygen is no longer needed, allow the baby to begin breastfeeding. If the baby cannot be breastfed, continue giving expressed breast milk using an alternative feeding method.
- If the breathing difficulty worsens at any time during the observation period: treat for moderate breathing difficulty
- All babies with mild and transient respiratory distress, do not need antibiotics. However, if the respiratory distress persists for more than 6 hour or there are risk factors, start antibiotics after taking a sepsis screen. Once respiratory distress settles and the sepsis screen is negative – STOP ANTIBIOTICS.

### ***Antenatal corticosteroids for prevention of RDS***

- *Antenatal corticosteroid therapy is a simple and effective therapy that prevents RDS.*
- *Optimal effect of antenatal steroids is seen if delivery occurs after 24 hrs of starting therapy.*
- *Recommended Dose is Inj Betamethasone 12 mg IM every 24 hrs X 2 doses or Inj. Dexamethasone 6 mg IM every 12 hrs X 4 doses.*
- *Give to mothers with preterm labour or APH before 34 wks of gestation.*

## **VIDEO DEMONSTRATION OF DIFFICULTY IN BREATHING**

This video demonstrates a neonate with fast breathing, chest retractions, nasal flaring and grunting.

## EVALUATION

A 7 day old baby born at term with a birth weight of 2.8 kg is brought with complaints of difficulty in breathing and inability to feed at the breast. The present weight is 2.65 kg, temperature is 36°C, and respiratory rate is 96 / min with moderate retraction with grunting and central cyanosis.

1. What is your assessment about the respiratory status of this baby and what is the likely diagnosis?

---

---

---

---

2. What supportive management would you do for this baby?

---

---

---

---

3. What are the ways of giving oxygen to the baby and how will you monitor efficacy of oxygen delivery.

---

---

---

---

4. A baby is born prematurely at 32 weeks of gestation and develops respiratory distress soon after birth with grunting and chest retractions. What is the likely diagnosis.

---

---

---

---

5. What are the principles of management of severe breathing difficulty?

---

---

---

---

6. How will you manage a baby who is brought with breathing difficulty and develops apneic spells.

---

---

---

---