

Respiratory distress in a newborn baby

Respiratory distress

- Cause of significant morbidity and mortality
- Incidence 4 to 6% of live births
- Many are preventable
- Early recognition, timely referral, appropriate treatment essential

Respiratory distress

- RR > 60/ min*
- Retractions
- Grunt
- ± Cyanosis

* Tachypnea

Causes of respiratory distress

- Pulmonary
- Cardiac- Congenital heart disease
- CNS- Asphyxia, IC bleed
- Metabolic- Hypoglycemia, acidosis

Causes of respiratory distress - Medical

- Respiratory distress syndrome (RDS)
- Meconium aspiration syndrome (MAS)
- Transient tachypnoea of newborn (TTNB)
- Asphyxial lung disease
- Pneumonia- Congenital, aspiration, nosocomial
- Persistent pulmonary hypertension (PPHN)

Surgical causes of respiratory distress

- Tracheo-esophageal fistula
- Diaphragmatic hernia
- Lobar emphysema
- Pierre -Robin syndrome
- Choanal atresia

Approach to respiratory distress

History

- Onset of distress
- Gestation
- Antenatal steroids
- Predisposing factors- PROM, fever
- Meconium stained amniotic fluid
- Asphyxia

Approach to respiratory distress

Examination

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

Assessment of respiratory distress

Score *	0	1	2
1. Resp. rate	<60	60-80	>80
2. Central cyanosis	None	None with 40% FiO ₂	Needs >40% FiO ₂
3. Retractions	None	Mild	Severe
4. Grunting	None	Minimal	Obvious
5. Air entry	Good	Decreased	Very poor

* Score > 6 indicates severe distress

Approach to respiratory distress

Chest examination

- Air entry
- Mediastinal shift
- Adventitious sounds
- Hyperinflation
- Heart sounds

Preterm - Possible etiology

Early progressive - Respiratory distress syndrome or hyaline membrane disease (HMD)

Early transient - Asphyxia, metabolic causes, hypothermia

Anytime Pneumonia

Term – Possible etiology

Early well looking

- TTNB, polycythemia

Early severe distress

- MAS, asphyxia,
malformations

Late sick with
hepatomegaly

Cardiac

Late sick with shock

- Acidosis

Anytime

- Pneumonia

Suspect surgical cause

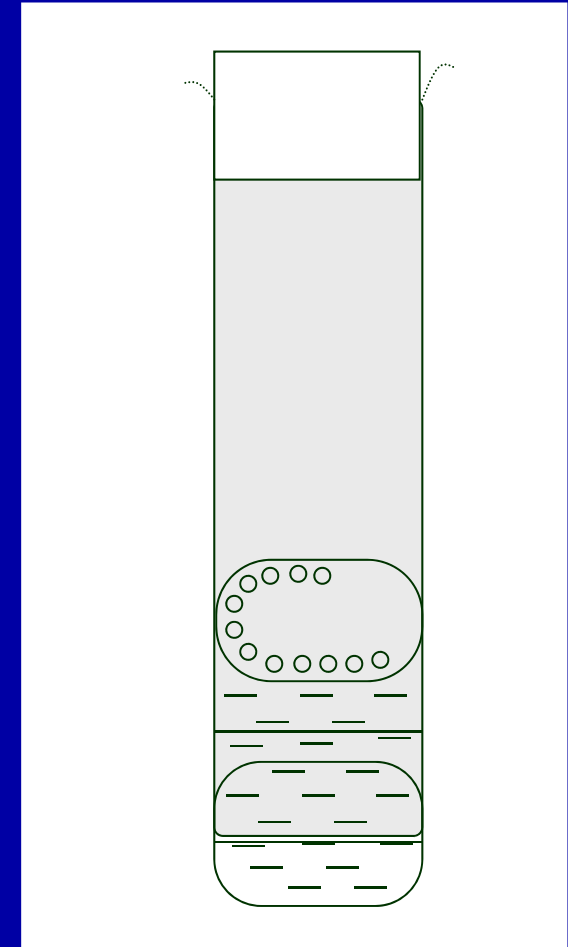
- Obvious malformation
- Scaphoid abdomen
- Frothing
- History of aspiration

Investigations

- Gastric aspirate
- Polymorph count
- Sepsis screen
- Chest X-ray
- Blood gas analysis

Shake test

- Take a test tube
- Mix 0.5 ml gastric aspirate + 0.5 ml absolute alcohol
- Shake for 15 seconds
- Allow to stand 15 minutes for interpretation of result



Respiratory distress - Management

- Monitoring
- Supportive
 - IV fluid
 - Maintain vital signs
 - Oxygen therapy
 - Respiratory support
- Specific

Oxygen therapy*

Indications

- All babies with distress
- Cyanosis
- Pulse oximetry $\text{SaO}_2 < 90\%$

Method

- Flow rate 2-5 L/ min
- Humidified oxygen by hood or nasal prongs

* Cautious administration in pre-term

Pulse oximetry

- Effective non invasive monitoring of oxygen therapy
- Ideally must for all sick neonates and those requiring oxygen therapy
- Maintain SaO₂ between 90 – 93 %

Respiratory distress syndrome (RDS)

- Pre-term baby
- Early onset within 6 hours
- Supportive evidence: Negative shake test
- Radiological evidence

X-ray - RDS



Pathogenesis of RDS

- Decreased or abnormal surfactant
- Alveolar collapse
- Impaired gas exchange
- Respiratory failure

RDS - Predisposing factors

- Prematurity
- Cesarean born
- Asphyxia
- Maternal diabetes

RDS - Protective factors

- PROM
- IUGR
- Steroids

Antenatal corticosteroid

- *Simple therapy that saves neonatal lives*

- Preterm labor 24-34 weeks of gestation irrespective of PROM, hypertension and diabetes
- **Dose:**
Inj Betamethasone 12mg IM every 24 hrs X 2 doses; or Inj Dexamethasone 6 mg IM every 12 hrs X 4 doses
- Multiple doses not beneficial

Surfactant therapy - Issues

- Should be used only if facilities for ventilation available
- Cost
- Prophylactic Vs rescue

Surfactant therapy - Issues

Prophylactic therapy

Extremely preterm <28 wks
<1000 gm

Not routine in India

Rescue therapy

Any neonate diagnosed to have RDS

Dose 100mg/kg phospholipid Intra tracheal

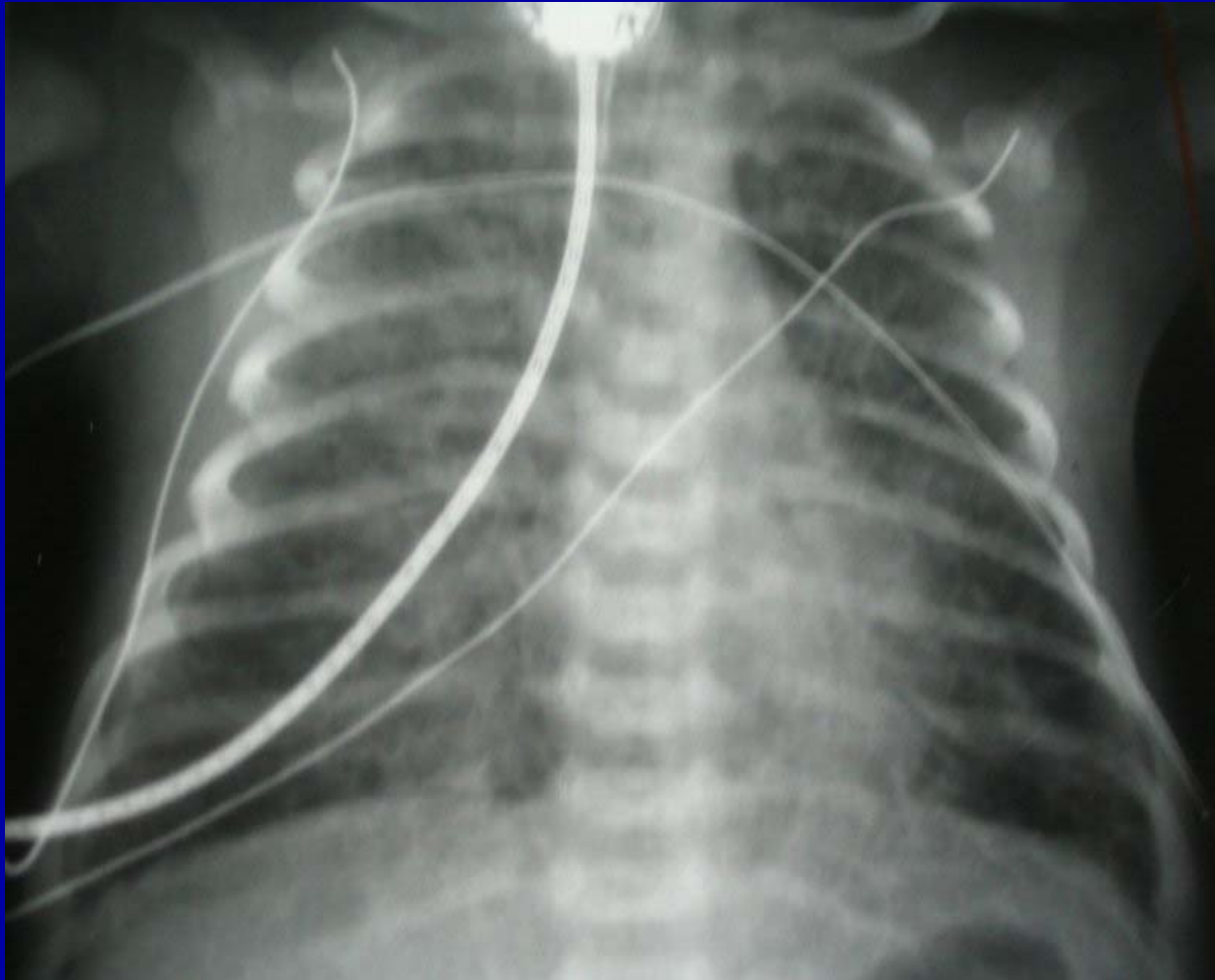
Meconium aspiration syndrome (MAS)

- Meconium staining
 - Antepartum, intrapartum
- Thin
 - Chemical pneumonitis
- Thick
 - Atelectasis, airway blockage, air leak syndrome

Meconium aspiration syndrome

- Post term/SFD
- Meconium staining – cord, nails, skin
- Onset within 4 to 6 hours
- Hyperinflated chest

X-ray - MAS



MAS - Prevention

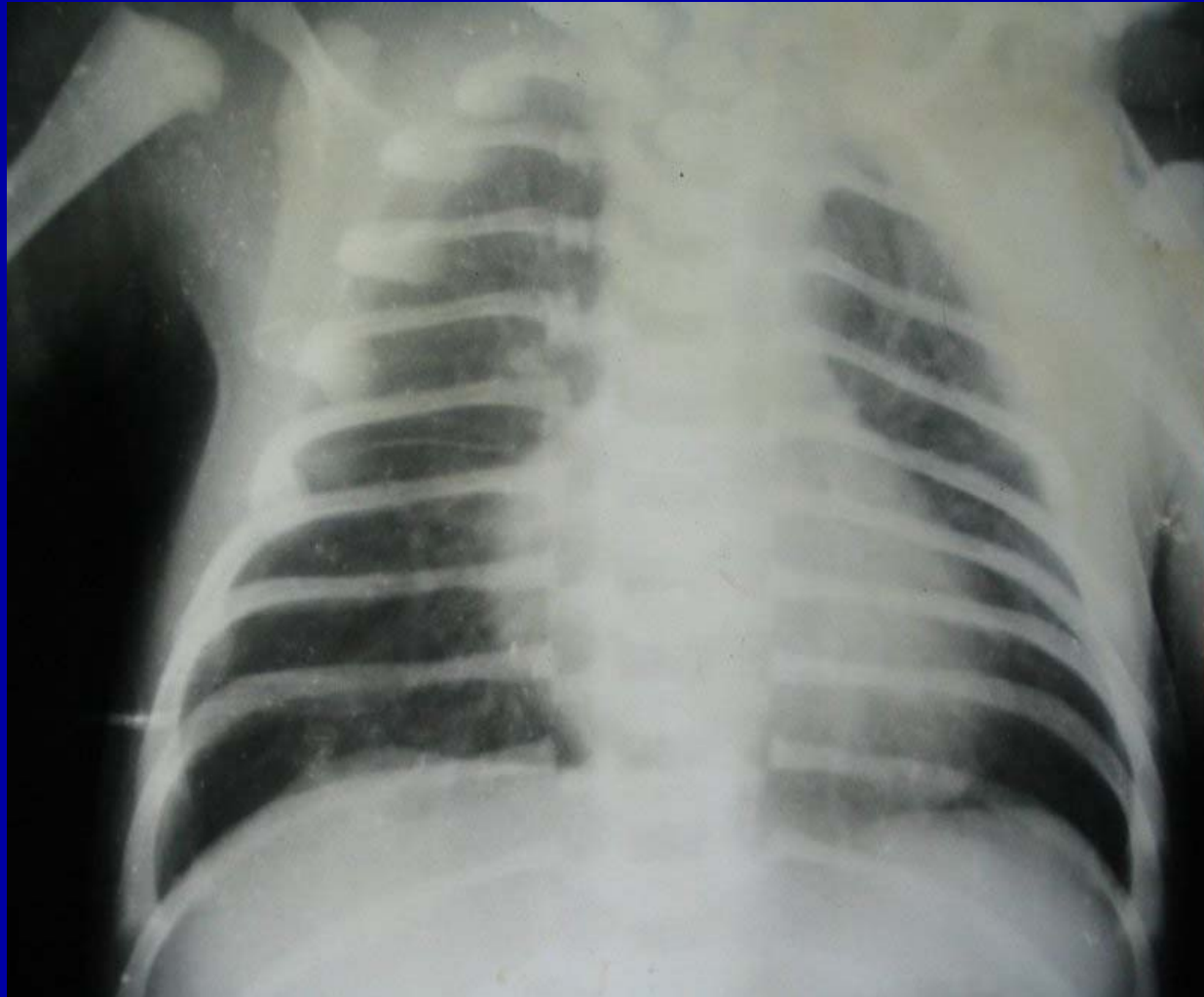
- Oropharyngeal suction before delivery of shoulder for **all** neonates born through MSAF
- Endotracheal suction for **non vigorous*** neonates born through MSAF

** Avoid bag & mask ventilation till trachea is cleared*

Transient tachypnoea of newborn (TTNB)

- Cesarean born, term baby
- Delayed clearance of lung fluid
- Diagnosis by exclusion
- Management: supportive
- Prognosis - good

X-ray- TTNB



Congenital pneumonia

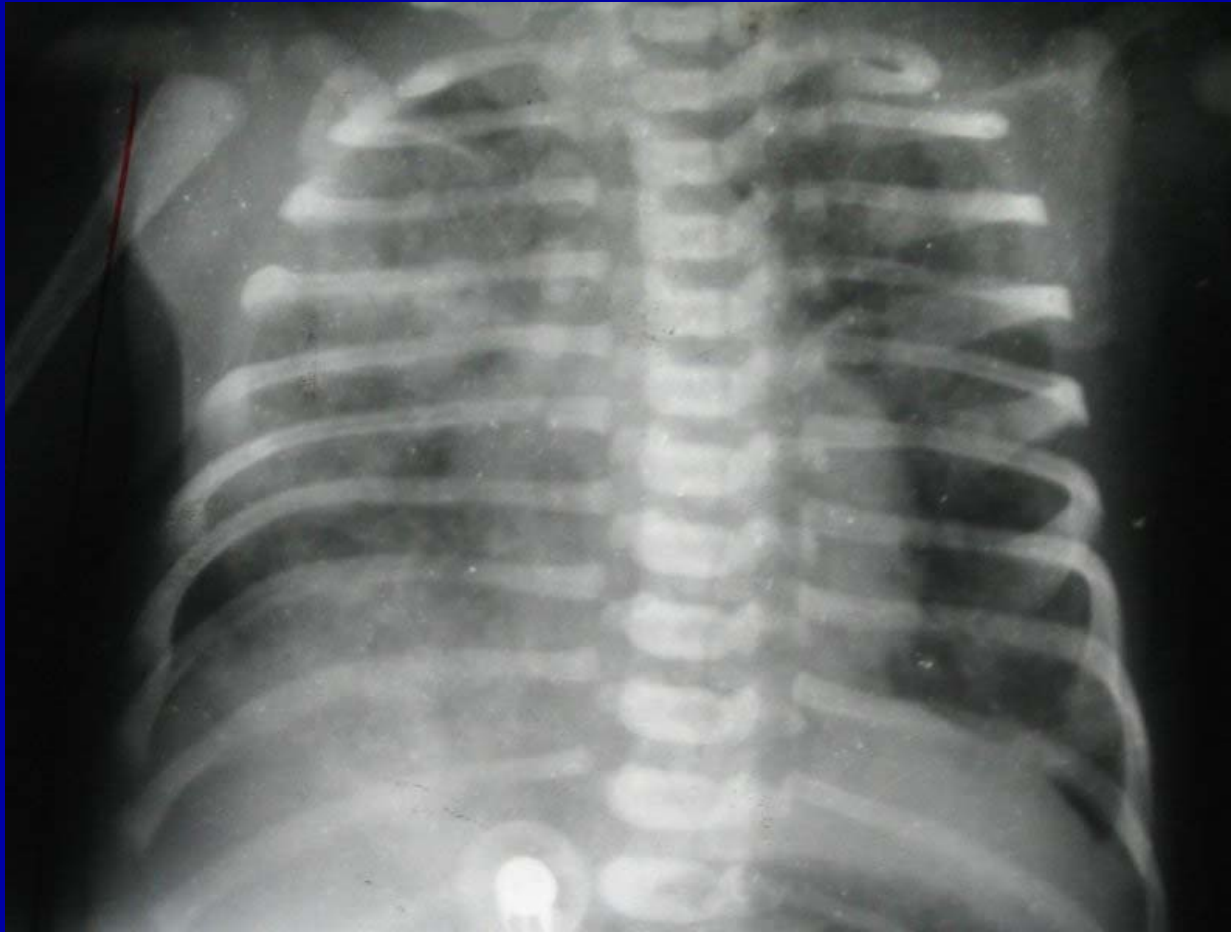
Predisposing factors

PROM >24 hours, foul smelling liquor,
Peripartal fever, unclean or multiple per
vaginal

Treatment

Thermoneutral environment, NPO, IV
fluids, Oxygen, antibiotics-
(Amp+Gentamicin)

X-ray – Congenital pneumonia



Nosocomial pneumonia

Risk Factor : Ventilated neonates
: Preterm neonates

Prevention : Handwash
: Use of disposables
: Infection control
measures

Antibiotics : Usually require higher
antibiotics

Respiratory distress in a neonate with asphyxia

- Myocardial dysfunction
- Cerebral edema
- Asphyxial lung injury
- Metabolic acidosis
- Persistent pulmonary hypertension

Pneumothorax

Etiology

Spontaneous, MAS, Positive pressure ventilation (PPV)

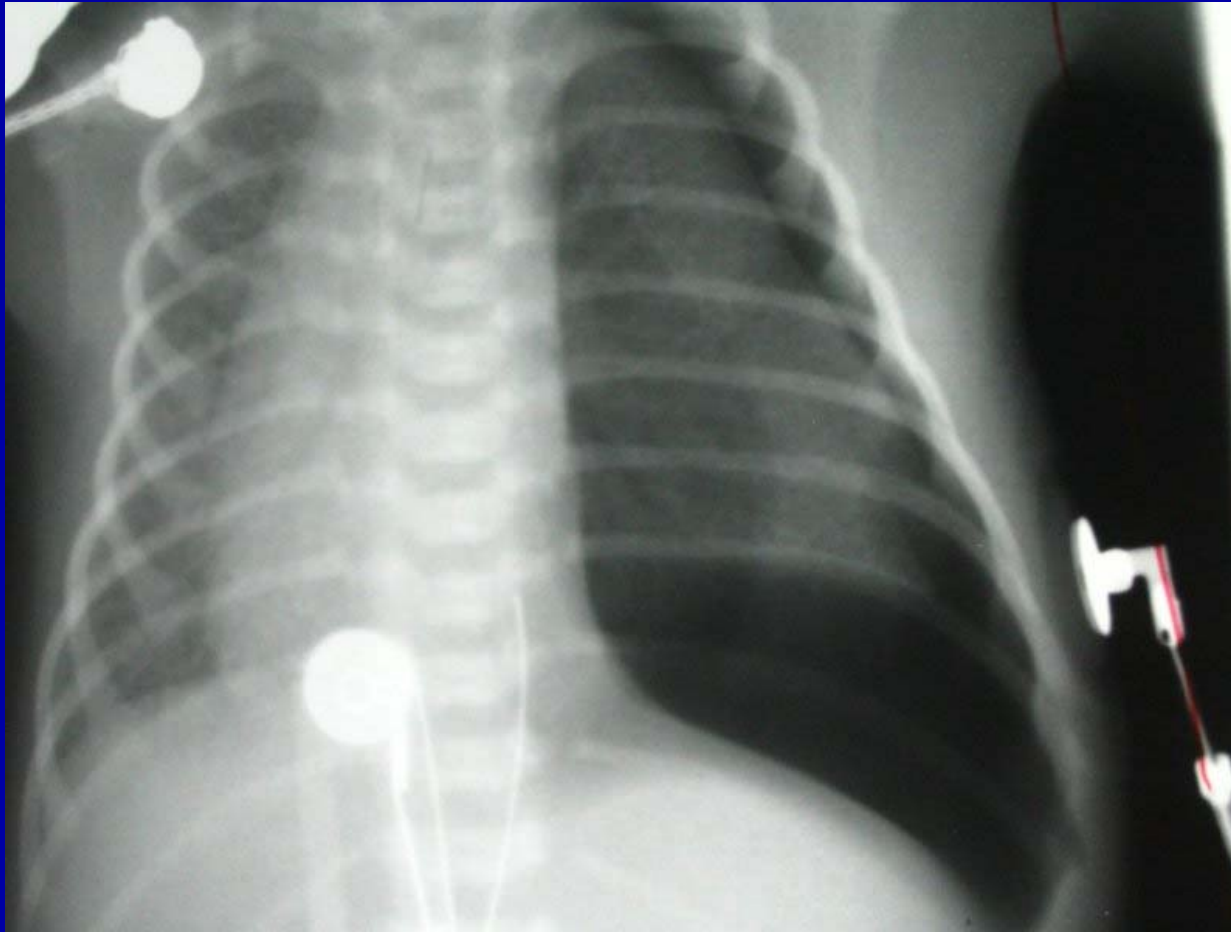
Clinical features

Sudden distress, indistinct heart sounds

Management

Needle aspiration, chest tube

X-ray - Pneumothorax



Persistent pulmonary hypertension (PPHN)

Causes

- Primary
- Secondary: MAS, asphyxia, sepsis

Management

- Severe respiratory distress needing ventilatory support, pulmonary vasodilators
- Poor prognosis

Respiratory distress (needing referral)

- RDS (HMD)
- MAS
- Surgical or cardiac cause
- PPHN
- Severe or worsening distress