



NCCU CLINICAL GUIDELINES
SECTION: 2

RESPIRATORY PROBLEMS AND MANAGEMENT

Section 2: Respiratory problems and management
Respiratory Distress Syndrome
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RESPIRATORY DISTRESS SYNDROME (RDS)

Respiratory Distress Syndrome is a condition of respiratory insufficiency as a result of surfactant deficiency. Signs of respiratory distress start soon after birth and increasingly becomes worse over the first 3 – 6 hours. It has characteristic radiographic findings of bilateral air bronchograms with a ground glass or reticulogranular appearance in the lung fields.

Previously known as Hyaline Membrane Disease.

INCIDENCE

- Is inversely related to gestational age.
- Other factors associated with incidence include preterm, low birth weight, perinatal asphyxia, maternal diabetes, multiple gestation, caesarean section without labour.

PATHOPHYSIOLOGY

A lack of surfactant and an overly compliant chest wall lead to progressive atelectasis and an inability to achieve and maintain an adequate functional residual capacity. This in turn results in an increase in work of breathing, decrease in lung compliance, increase in resistance, decreased lung volume and alteration in ventilation-perfusion ratio.

Clinical improvement occurs around 36 – 72 hours of age when surfactant synthesis occurs.

Severe RDS can be associated with raised pulmonary vascular resistance contributing to hypoxia.

CLINICAL PRESENTATION

- Signs of increasing respiratory difficulty from birth including tachypnoea, expiratory grunt, nasal flaring, retractions – sternal, subcostal and intercostal.
- Cyanosis in room air.
- These infants often have reduced tone, pallor and increase in capillary refill time.

INVESTIGATIONS

- Arterial blood gas.
- CXR (AP and Lateral).
- U&Es and glucose (baseline).
- Blood cultures, CRP, FBP (differential diagnosis).
- Consider cardiac USS to excluded CHD and to assess pulmonary vascular resistance and the ductal shunt.

MANAGEMENT

1. Aim of treatment is supportive until lung disease resolves and to prevent atelectasis. Avoid hypoxemia, acidosis and hypothermia these influence natural surfactant synthesis. Increasing FiO₂ also denatures surfactant.
2. Respiratory support as clinically indicated. Early CPAP has been shown to alter the progression of the lung disease and support natural surfactant synthesis. Discuss need for intubation with SR or consultant.

3. Surfactant replacement therapy should be used for all infants requiring intubation.
 - Prophylactic therapy with surfactant in delivery ward or theatre is the ideal when intubation is required.
 - Rescue therapy should be administered as early as possible within the first hour of life.
 - INSURE method of surfactant administration should also be considered for infants managed on CPAP.
 - See *NCCU Clinical Guideline for [Surfactant Therapy](#) and Medication protocol [Survanta](#) / [Curosurf](#) for further information.*
4. Infants who need to be transported post-delivery with an ETT *in situ* should be treated with exogenous surfactant as per the NETS guidelines.
5. Differential diagnosis is imperative as congenital pneumonia has similar signs and symptoms and x-ray appearance. Antibiotic therapy should be considered on individual basis until sepsis has been ruled out.
6. Other supportive therapies:
 - Maintain thermoregulation.
 - Fluids and nutrition (Monitor U+E's. Take into account TEWL and insensible water losses, weight fluctuations. Infants with RDS often have fluid retention. Fluid overload can also impact PDA).
 - Circulation - monitor blood pressure closely within the acute phase of RDS.

INDICATIONS FOR INTUBATION

- A rising PaCO₂ to >60mmHg and falling pH<7.25 despite CPAP.
- Increasing FiO₂ and hypoxia.
- Recurrent apnoea requiring stimulation and resuscitation.
- Incipient collapse.
- Administration of surfactant replacement therapy.
- The requirement of intubation should be discuss with the SR or consultant.

NOTE:

Avoidance of high tidal volumes is essential for prevention of air-leak syndromes, especially in the period of rapid increase in compliance following surfactant administration. Volume guarantee should be commenced as soon as the infant is placed on a ventilator.