Clinical Guideline: Surfactant Administration

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For use in: NSC Neonatal Units
Guidance specific to the care of neonatal patients

Used by: Medical Staff, Neonatal Nurse Practitioners

Key Words: Surfactant, gestation, delivery, meconium, doses

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Audit Standards:

1. All infants <27 weeks gestation will receive prophylactic surfactant at delivery¹
2. Any infant >26 weeks and <30 weeks gestation should receive a dose of surfactant if intubated at delivery or if the mother has not received corticosteroids prenatally¹.
3. Any infant requiring ventilation with symptoms of Respiratory Distress Syndrome (RDS) will receive surfactant.
Guideline for Surfactant Administration

1. Introduction
The administration of exogenous surfactant at or soon after birth should be considered for infants judged to be at high risk of developing Respiratory Distress Syndrome (RDS). Prophylactic and rescue treatment reduces:

- Incidence of pneumothorax
- Risk of developing pulmonary interstitial emphysema
- Ventilatory requirements
- Mortality

Natural surfactants have been found to be superior to synthetic ones with further reductions in mortality, a lower occurrence of pneumothorax and faster weaning.

2. Indications
- Infants requiring low FiO₂ where INSURE technique (Intubation, Surfactant then Extubation) may be appropriate
- Infants requiring prophylactic surfactant and ongoing ventilation
- Infants requiring rescue surfactant and ongoing ventilation

3. Possible Complications of Surfactant
- Endotracheal tube blockage
- Pulmonary haemorrhage
- Intracranial haemorrhage

4. Prophylaxis
- All infants <27 weeks gestation within 15 minutes of birth
- It should be considered if the infant is >26 weeks gestation but <30 weeks gestation and intubation is required in the delivery suite or if the mother has not received prenatal corticosteroids.

Surfactant should be administered as soon as possible after intubation as this leads to earlier establishment and maintenance of the functional residual capacity. Where Survanta is administered on the unit rather than the delivery suite – it should be administered as soon as the infant is monitored and stable.

5. Early Rescue
Consider using surfactant in the following:
- Any infant requiring ventilation with an increasing oxygen requirement
- Chest X-ray consistent with RDS
- Severe meconium aspiration
- Group B Streptococcus pneumonia
- Pulmonary haemorrhage

6. Further doses
- The need for a second or third dose should be based on a persistent oxygen requirement (FiO₂ >30%) and continued ventilation
- The infant on CPAP 6cm H₂O in >50% oxygen who is going to require ventilation

A single dose is adequate for surfactant deficiency in most infants the crucial variable for the need for a second dose is lung injury. If the infant has made significant improvement (FiO₂ <0.3, with reducing pressure and/or rate) further doses
will not be required. If an infant remains in hypoxic respiratory failure further doses could be considered along with alternative ventilatory strategies\textsuperscript{18}.

7. Administration of Curosurf

7.1 Dose

100-200mg/kg per dose\textsuperscript{19} (rounded to the nearest whole vial)
Further doses at 100mg/kg as indicated by clinical condition
Prescribed on the drug chart

1. Once intubated, after initial inflation breaths – ensure that the chest wall is rising with inflation, checking for symmetrical air entry/chest expansion. If there is any discrepancy the tube should be pulled back slightly and the air entry re-assessed. Where confident that the tube has passed through the cords the 1\textsuperscript{st} dose should be given before ventilation commences.
2. Suction if necessary to clear secretions.
3. Make sure the infant is in a supine position and the head in the midline
4. Thread the nasogastric tube (NG) down the endotracheal tube and administer the surfactant as a rapid single bolus
5. Withdraw the syringe and draw up 1ml of air and flush the NG tube with the air to ensure that the surfactant has been administered.
6. Give positive pressure ventilation for 30-60 seconds (or until the surfactant is no longer refluxing in the ETT) to facilitate the spreading of the surfactant – these breaths may need to be of a slightly higher pressure with a longer inspiratory time.
7. Connect to ventilator – usually there is a need to reduce initially the FiO\textsubscript{2} and then the pressures within 30 minutes as lung compliance improves quite rapidly. Therefore monitoring should be established and the doctor/NNP should be monitoring chest wall movement. Watch the TcpO\textsubscript{2}/SaO\textsubscript{2} and alter the FiO\textsubscript{2} as necessary.
8. A blood gas should be taken within 30 minutes of administration of surfactant.
9. If the infant is stable and the results of the blood gas analysis are good, extubation should be considered with a view to CPAP.

8. Administration Of Survanta

8.1 Dosing

100mg/kg equivalent of 4ml/kg preferably within 8 hours of birth\textsuperscript{19}
Further doses as indicated by clinical condition within 48 hours
Prescribed on the drug chart

8.2 Administration

To ensure that the Survanta is evenly distributed throughout the lungs each dose is divided into fractional doses and then administered whilst the infant is in different positions i.e. head on alternate sides – between each fractional dose the infant is ventilated for 30 seconds.

9. Storage

Both Curosurf and Survanta should be:
- Stored at +2 to +8°C
May settle and may need gentle swirling to obtain uniform suspension
DO NOT SHAKE
Should be checked for discoloration before use
Warmed slowly to room temperature before administration
Any unused, unopened warmed surfactant can be returned for storage to the refrigerator as long as it is within 24 hours – once only.

References


8. Stevens TP, Harrington EW, Blennow M, Soll RF. (2007) Early surfactant administration with brief ventilation vs. selective surfactant and continued mechanical ventilation for preterm infants with or at risk of respiratory distress syndrome. *Cochrane Database of Systematic Reviews.* October 17;(4):CD003063. [Ia]


