

Less Invasive Surfactant Administration (LISA)

Procedure Responsibilities and Authorisation

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Target Audience	SMO's, Registrars, Nurse Practitioners, Clinical Nurse Specialists
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Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
1.0	Lee Carpenter	Feb 2021	New document

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Less Invasive Surfactant Administration (LISA)

1 Overview

1.1 Purpose

LISA (less invasive surfactant administration) has been shown to be an effective and safe treatment of respiratory distress syndrome (RDS). It does not require sedation, minimises airway injury, and avoids placing positive pressure ventilation on an immature lung therefore reduces need for intubation, reduces oxygen requirement, reduces pCO₂ levels and prevents risk of pneumothorax in a spontaneously breathing infant.

1.2 Scope

Waikato District Health Board (DHB) staff working in NICU e.g. Medical staff.

1.3 Patient / client group

A neonate with gestational age equal to or greater than 28 weeks.

1.4 Exceptions / contraindications

- Intubated infants
- Infants < than 28 weeks unless SMO approval

1.5 Definitions and acronyms

CNS	Clinical Nurse Specialist
CPAP	Continuous positive airways pressure
IV	Intravenous
Medical Staff	In NICU they include Neonatal Nurse Practitioners, Clinical Nurse Specialists, Registrars and SMO's
NNP	Neonatal Nurse Practitioner
RDS	Respiratory Distress Syndrome
SMO	Senior Medical Officer

2 Clinical management

2.1 Competency required

Competent at oral intubation or under supervision by SMO, NNP, CNS or Registrar.

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2.2 Indications for LISA

A gestational age equal to or greater than 28 weeks with clinical signs of RDS, such as;

- Tachypnoea and increased work of breathing
- A chest x-ray consistent with RDS
- An inspired oxygen requirement of greater than 30%
- Recent blood gas suggestive of respiratory acidosis

2.3 Equipment

The neonatal resuscitation trolley, intubation equipment and a Neopuff should be readily available. Ensure there is a working suction with a size 10 suction catheter attached. For the procedure itself the following equipment is required;

- Surfactant refer to: Poractant alfa (Curosurf) for neonates (0444) warmed to room temperature
- A 5ml syringe with a draw up needle, ensure this is not a filter needle
- A laryngoscope with the appropriate sized blade
- Vygon 6Fr 200mm
- If using 16G angiocath (130mm), a tape measure, lip or eyeliner.
- And short iv extension tubing to attach to syringe of Surfactant

2.4 Procedure

Video Link to Procedure: <https://www.starship.org.nz/guidelines/practice-recommendation-for-lisa-mist/>

Before LISA: Complete cares and aspirate the stomach, record observations, swaddle the baby and administer sucrose refer to: Sucrose Oral Liquid for Analgesia in Neonates and Infants (2905)

One nurse is assigned to hold the infant during the procedure.

If vigorous; consider use of intranasal Midazolam @200-300mcg/kg (2939)

LISA Procedure:

- Draw up the required surfactant (2.5ml/kg or 200mg/kg for first dose and 1.25ml/kg or 100mg/kg for second and subsequent doses), and remember not to use a filter needle. The vial should be gently turned upside down without shaking, in order to obtain a homogenous suspension!
- If using an IV extension, flush the tubing, but do not attach to the vygon/angiocath catheter until after insertion.
- Note position on vygon catheter or mark the angiocath at the calculated length (2 cm from the tip or calculate length (kg + 6cm) for position at the lips).

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- Remove the introducer needle from the vygon/angiocath catheter, and fashion an anterior curvature of the angiocath to aid insertion. Vygon catheter is already fashioned.
- If desired, you may give atropine at 20mcg/kg via IV.
- Visualize the cords with the laryngoscope and insert vygon/angiocath catheter aiming to pass the catheter past the vocal cords to the desired depth. Magill's forceps can be used to help.
- The baby remains on CPAP via F&P Midline CPAP throughout the procedure if at all possible to maintain PEEP pressure. If the interface on the nose is in the way of the laryngoscope push it out of the way whilst visualizing the cords, then reposition before administering the surfactant.
- There should be no more than 2 attempts by either senior medical officer, NNP, registrar or CNS to intubate, and 1 attempt by a second staff member before the procedure is stopped in favour of premedication and formal intubation.
- Remove the laryngoscope and hold the baby's mouth shut with your hand to secure the vygon/angiocath catheter in position. Check observations are stable. Check position of the vygon/angiocath catheter with the CO2 detector if unsure of placement. If a less experienced practitioner is inserting the catheter then a video laryngoscope (when available) could be used.
- Connect the IV tubing or syringe and instil the surfactant either as a continuous slow push, as demonstrated in video (see link), or in 2-4 boluses over a period of up to 60 seconds.
- If there is a fall in heart rate or the baby stops breathing, one option is to slow down the administration of surfactant.
- Flush the remaining surfactant through the IV tubing and vygon/angiocath catheter with some air.
- Remove the vygon/angiocath catheter once the surfactant has been given and maintain CPAP.

2.5 Potential complications

Be prepared to give positive pressure ventilation if clinically indicated, such as apnoea, chest not moving, or bradycardia. There may be some refluxing of surfactant into the oropharynx and this is to be expected.

2.6 After care

- Optimise the baby by positioning prone, as this is the ideal position for lung expansion and uptake of surfactant, and leave undisturbed for as long as able after the procedure.
- The baby may also sound like it will need a suction however do-not suction for up to 12 hours post procedure (as per ETT surfactant administration) unless absolutely indicated and then minimal gentle suction only.

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- Once heart rate, oxygen saturation, and respiratory effort are close to baseline values, restore the infant into their previous position, ensuring CPAP is optimized. Consider reducing CPAP pressures, and titrate inspired oxygen to saturations. Do a blood gas 30-60 minutes post procedure. Document the procedure in clinical notes.
- A second installation of surfactant is possible after 8-12 hours if clinically indicated and generally at 100mg/kg or 1.25ml/kg unless SMO direction for repeat dose of 200mg/kg (2.5ml/kg) is requested.

3 Patient information

Once a decision to perform LISA for RDS has been made, verbal consent from parent/caregivers is obtained. [Caffeine Citrate](#) (0591) should be part of the management plan for babies under 30 week's gestational age.

4 Audit

4.1 Indicators

- The threshold for LISA meets criteria 2.3
- Documented monitoring of saturations, oxygen requirement, ABG/Cap gas before, during and after procedure
- Monitor LISA incidents

5 Evidence base

5.1 Bibliography

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5.2 Associated Waikato DHB Documents

- NICU drug guideline [Caffeine Citrate for neonates](#) (Ref: 0591)
- NICU drug guideline [Midazolam for neonates](#) (Ref: 2939)
- NICU drug guideline [Poractant alfa \(Curosurf\) for neonates](#) (Ref: 0444)
- NICU drug guideline [Sucrose Oral Liquid for Analgesia in Neonates and Infants](#) (Ref: 2905)

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