London Neonatal
Operational Delivery Network

**North West London**

**NETWORK CLINICAL GUIDELINE**

# Less Invasive Surfactant Administration (LISA) pathway in North West London Neonatal Network neonatal units

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| Related documents | |

## INTRODUCTION

The aim of this document is to provide a consistent clinical approach to infants undergoing Less Invasive Surfactant Administration (LISA) across the North West London Perinatal Network based on latest national and international guidance and evidence including the BAPM Neonatal Airway Safety Standard published in 2024.

This process of surfactant administration is also known as Minimally Invasive Surfactant Therapy (MIST) but for consistency the term 'Less Invasive Surfactant Therapy' or 'LISA' will be used in this document.

Less invasive surfactant administration (LISA) is a method of surfactant delivery to preterm infants for treating respiratory distress syndrome (RDS). The primary pathology in RDS is relative surfactant deficiency. A meta-analysis of trials comparing LISA with other methods of surfactant delivery indicated that, for RDS, LISA reduces the need for mechanical ventilation at any time during neonatal intensive care, which can reduce the composite risk of death or bronchopulmonary dysplasia and the time on mechanical ventilation.[1,2,3]

The incidence of RDS is highest in babies <32 weeks gestation.[3] However, LISA can be considered for higher gestations, as factors other than prematurity can contribute to surfactant deficiency, though for all gestations the likelihood of other causes of respiratory distress should be considered prior to LISA administration.

LISA must be performed whilst continuous non-invasive ventilation is performed.[3] In the majority of cases, it is suggested that this is nasal continuous positive airway pressure (nCPAP) to ensure adequate alveolar aeration and dissemination of surfactant. However, LISA can be performed on high flow nasal cannula oxygen therapy ($HFNCO_2$) as guided by the attending Consultant.

## RATIONALE & SCOPE

This document has been created as guidance for all neonatal staff involved in administration of surfactant through LISA technique. This guideline is to ensure consistent and safe standards are met and maintained in LISA.

In the neonatal units of the North West London Perinatal Network, the surfactant of choice is poractant alfa (Curosurf®).

## DEFINITIONS & ABBREVIATIONS

CPAP – Continuous positive airway pressure

ETT – Endotracheal tube

$FiO_2$ – Fraction of inspired oxygen

HFNCO2 - High flow nasal cannula oxygen therapy

LISA - Less Invasive Surfactant Administration

MIST – Minimally invasive surfactant therapy

NWL – North West London

RDS – Respiratory distress syndrome

## FULL GUIDELINE

### 1.1 Respiratory distress syndrome and surfactant administration

It is recommended that consultants are prospectively aware of all cases on whom LISA is being considered or delivered.

LISA is usually performed on the Neonatal Unit to aid neonates with respiratory distress and reduce the frequency of mechanical ventilation being used. It may also be performed on Labour Ward/ Delivery Suite subject to local guidelines and consultant approval.

Surfactant is not a resuscitation drug and needs to be given once the baby is stabilised; stabilisation of the baby after birth should follow NLS guidelines.[3]

There is no lower gestational age limit for LISA, but careful consideration needs to be made of the benefits of LISA vs other methods of surfactant administration (intubation with INSURE technique) for primary surfactant administration in neonates <25 weeks gestation. Babies <27 weeks who are born in a level 1 or 2 unit will usually be intubated for transfer and LISA may not be appropriate.

The incidence of RDS is correlates with the degree of prematurity. In neonates >32 weeks gestation the incidence of RDS is reduced, and benefits of LISA less proven.[3,4] However, LISA should also be considered for gestations >32 weeks with respiratory distress, as factors other than prematurity (maternal glucose dysregulation, infection, hypothermia etc.) contribute to surfactant deficiency. In babies born at gestations >32 weeks other causes of respiratory distress should be considered prior to LISA administration.

Surfactant deficiency is commonly associated with the requirement for supplemental oxygen, and we suggest the $FiO_2$ requirement ≥ 0.3 as a lower threshold for LISA.[3,5] However, there is no lower limit of $FiO_2$ requirement that precludes surfactant administration in the context of clinical signs of increased work of breathing and a likely diagnosis of surfactant deficiency. Clinical signs of surfactant deficiency include tachypnoea, grunting, recessions and, less commonly, cyanosis.

Radiological evidence may support the diagnosis of surfactant deficiency – ground glass appearance with air bronchograms, low volumes lungs and a bell-shaped thorax.[6] However, radiological evidence is not essential prior to administration of LISA as RDS is primarily a clinical diagnosis and the greatest benefit of LISA comes with early administration. A chest x-ray should be considered to exclude other pathology in infants >32 weeks gestation where the diagnosis of RDS is less common.[3]

**Preterm risk factors for the development of RDS requiring surfactant replacement[6]:**

- Lack of exposure or incomplete course of antenatal steroids.
- Premature rupture of membranes for more than 6 days.
- Chorioamnionitis.
- <28 weeks gestation especially after Caesarean section.
- Small for gestational age and pre-eclampsia.
- Infants hypothermic following birth and initial stabilisation (<36.5 $^0$C)
- Surfactant deficiency is also commonly seen in babies of mothers with dysregulation of glucose control in pregnancy, this includes gestational and pre-existing diabetes mellitus.

### 1.2 Indications and patient demographics

**Indications for LISA method:**

- Neonates with RDS < 72 hours of age with clinical stability on non-invasive ventilatory support with FiO2 ≥0.3 requiring rescue surfactant early in the course of the disease[5]
- Neonates < 72 hours of age with significant work of breathing and clinical signs consistent with surfactant deficiency +/- radiological evidence of surfactant deficiency. $FiO_2$ may be <0.3 but surfactant administration deemed likely to positively impact their clinical course. Additionally, POCUS lung ultrasound might be used to assess severity of RDS and need for surfactant replacement depending on local practices.

All neonates in whom LISA is performed must be considered likely to tolerate the LISA procedure

**Clinical considerations for safe and effective LISA administration:**

- Normothermic preterm neonate, likely to maintain their temperature during the procedure[5]
- Effective non-invasive ventilatory support (nCPAP or $HFNCO_2$)
- Neonate on continuous oxygen saturation and heart rate monitoring
- Clinical team trained in performing and supporting LISA administration

***Exclude pathologies requiring different treatment strategies prior to LISA administration***

- The most common example of this is pneumothorax. Clinical assessment, and where possible on the neonatal unit, transillumination, chest –X-ray or lung ultrasound should be performed to exclude significant pneumothorax prior to administering LISA therapy.[7]
- It is advisable that neonates ≥ 34 weeks should have adequate assessment including a chest X-ray to exclude pathologies other than surfactant deficiency.

**When to consider intubation and mechanical ventilation:**

Neonate with:

i. a primary diagnosis other than RDS where surfactant administration alone is unlikely to be helpful (and possibly harmful) and where sustained ventilator support is necessary (e.g. pneumothorax, pneumonia, sepsis, pulmonary haemorrhage, persistent pulmonary hypertension of the newborn, meconium aspiration syndrome,). In particular, consider these differential diagnosis in neonates born ≥34 weeks gestation, where surfactant deficiency as the primary underlying aetiology(unless infant of a diabetic mother) is less common.

ii. an evolving pattern of respiratory failure which suggests / necessitates rapid endotracheal intubation and mechanical ventilation instead of LISA (severe respiratory distress, severe respiratory acidosis, high oxygen requirement > 60% on non invasive ventilation).

### 1.3 Preparation and dose

- Where possible / appropriate – update the parents regarding the rationale for, and process of, the LISA procedure.
- "Poractant alfa" is the surfactant product used, otherwise known by the brand name Curosurf® and is available in 120mg or 240mg vials. Availability of 240mg vials may vary across trusts.
- Curosurf® should be stored in a secure fridge, but accessible to medical and nursing staff.
- Where surfactant administration – via LISA or via the ETT – is likely to be given in the delivery room (with prior discussion and Consultant awareness), the surfactant should be taken to these deliveries by the neonatal team.
- Always prescribe any Curosurf® which has been drawn up regardless of whether it is then given. It is recommended that Curosurf® usage is logged in a formalised log book.
- Warm the vial in your hand for 5 minutes before administration. Curosurf® should NOT be warmed in an incubator or cot.
- If appropriate consider the administration of whole vials, with the number given determined by the baby's birth weight. This should only be under senior recommendation.

**Initial / first LISA surfactant administration**

- The recommended dose of Curosurf® for first exogenous surfactant administration is 200mg/kg[8]

**Suggested doses of Curosurf® when the weight is unknown.**

Subject to local guidelines, LISA can be given in the Delivery Room / on Labour Ward with Consultant approval and a team trained and competent to do so.

Often, to maintain clinical stability, a weight will not have been performed prior to stabilisation on nasal CPAP or HFNCO2 in the Delivery Room. This can make titration of an appropriate dose of surfactant challenging.

- If an estimated fetal weight has been performed within the last 7 days, this should be used to guide surfactant dose.[8]
- If no recent estimated fetal weight is available, **Appendix 3** can be used to guide the surfactant dose based upon gestation, predicted weight and a target Curosurf® dose of 200mg/kg.[8,9]

If, when the weight is known, the surfactant dose is noted to equate to <150mg/kg then a further surfactant dose could be considered if required d based on clinical condition.

**Repeated doses of surfactant by LISA**

A second and occasionally a third dose of surfactant should be given if there is ongoing evidence of RDS such as persistent high oxygen requirement and other problems have been excluded[5]. Repeat LISA administration should be a consultant-led decision.

Between LISA administrations, careful review of the initial administration should be performed to identify whether surfactant was successfully instilled and how the next procedure can be performed to maximise success.

- The recommended Curosurf® dose for repeated LISA administration is 100mg/kg, but the dose can vary between 100-200mg/kg as defined in local guidelines.[4,9]

- The total dose of surfactant administered over repeated surfactant administrations should not exceed 400mg/kg[9]

### 1.4 Premedication for the procedure

It is recommended that for LISA procedures performed on the neonatal unit premedication should be used to sedate and provide analgesia for the procedure, however, this is at the discretion of the attending Consultant. Using weight banded doses can reduce the time of preparation of these medications (Appendix 4.)

#### 1.4.1 Opiate sedation/analgesia & comfort care

While the recommended choice of analgesia is Fentanyl in this NWL Network guideline, local protocols for opiate premedication should be checked and adhered to, unless specifically advised otherwise by the attending Consultant.

The rationale for this method of pharmacological sedation is to the aim of achieving light sedation wit analgesia whilst preserving respiratory drive.
It is the spontaneous respiratory drive that is both necessary to maintain oxygen saturations and heart rate during the procedure, and to aid surfactant dispersion through the lungs.

The recommendation of this guideline is:

- Intravenous fentanyl at a dose approximating 0.7micrograms/kg is used for sedation[3]
- Oral/buccal breast milk or 24% sucrose also used for comfort/analgesia

A weight-based dosing regime has been calculated for the fentanyl and this can be found in **Appendix 4**.

#### 1.4.2 Atropine

A potential complication of the LISA procedure include an induced bradycardia which comes from both physical stimulation of the parasympathetic nervous system when using the laryngoscope to visualise the upper airway and the effect of the fentanyl sedation.[3]

Atropine should be available for use without delay in case of sustained bradycardia, not responding to increased inspired oxygen and lung recruitment techniques. However, local protocols should be followed as to whether (or not) this is routinely drawn up prior to the procedure.

- The recommended atropine dose for LISA is 10micrograms/kg.[3]

### 1.5 Method of Administration

- LISA is a 2-person administration technique, and requires continuous neonatal nursing support the procedure.[3]
- LISA should be performed only by an experienced neonatal doctor or ANNP who has been trained to carry out the procedure and is confident in intubating preterm infants (there must also a prior Consultant approval regarding their suitability to perform the procedure).[3]
- LISA should be performed by staff who are competent in intubation.[3]

- Use of the video laryngoscope is highly recommended, particularly for procedures on the neonatal unit, but not mandated for LISA administration.[3]

***A LISA procedure should not be used to train junior doctors to intubate.***

It is suggested that formalised training is performed and recorded to assess competence of clinical staff (medical and nursing staff) with performing and supporting the procedure.[3]

A laryngoscope should be used to visualise the vocal cords. Whilst LISA may be perceived as being less technically difficult than intubation, confirming correct catheter placement requires confidence in the operator's capability to recognise appropriate placement, the use of video laryngoscopy can support this.

Use of the video laryngoscope requires further training and assessment prior to use in an in-vivo clinical situation. If video laryngoscopy is unavailable or if there is no clinician in attendance trained and competent in using the video laryngoscope then a standard laryngoscope should be used with insertion of the LISA catheter under direct vision of the clinician performing laryngoscopy.

### 1.5.1 Equipment required:

- Airway trolley (containing ETTs and associated equipment should complications arise)
- Non-invasive positive pressure ventilation support e.g. NeoPuff®
- Equipment for continuous monitoring of O2 sats and heart rate
- Suction devices with appropriately sized suction catheters
- Premedication (and giving equipment)
- Laryngoscope (+/- video laryngoscope) with appropriate sized blade
- Surfactant administration equipment – sterile dressing pack, 5 ml syringe, 20 G needle to draw up surfactant.
- Poractant alfa (Curosurf®)
- LISA catheter for endotracheal instillation of surfactant.
- (Optional) T-piece / vascular device connector to reduce direct pressure effect on the LISA catheter when administering the surfactant.

### 1.5.2 Suggested LISA methodology:

**PLEASE USE ACCOMPANYING NWL LISA CHECKLIST WHEN PERFORMING PROCEDURE (Appendix 1)**

**Part 1: Preparation**

- **Ensure criteria for LISA are met and Consultant awareness and approval for procedure.**
- Clinical examination +/- point of care techniques (transillumination or lung USS), chest X-ray to exclude significant pneumothorax requiring aspiration/drainage.
- Inform parents and explain procedure.
- Ensure appropriate environment for the procedure – controlled clinical situation with appropriately trained staff and availability of all necessary equipment and medications.

- Ensure baby is normothermic, and measures in place to maintain normothermia during procedure.
- Ensure baby settled with regular respiratory pattern and appropriate bilateral air entry on non-invasive ventilation providing positive end-expiratory pressure.
- Ensure good mask or nasal prong seal if using nCPAP and effective CPAP delivery.
- Check that the baby has continuous heart rate and saturation recording.
- Check suction devices available and methods for non-invasive lung inflation / ventilation are available and set appropriately.
- Have airway trolley available containing equipment for intubation should the procedure have complications.
- Prepare the pre-medications as per the guideline (or local protocol if an agreed difference).
- Ensure baby can be positioned to facilitate easy laryngoscopy (no obstructions from incubator, suitable height for operator, good swaddling). IV cannula should be available and the chest can be seen to assess regularity and work of breathing.

**Part 2: Pre-medication / sedation**

- Use of fentanyl IV (see Premedication section and Appendix 1) or opiate pre-medication as per local protocol if agreed difference. Administer opiate sedation and saline flush over 3-5 minutes.
- Use of buccal 24% sucrose or MEBM as non-pharmacological interventions for comfort
- Await for observed sedation to take effect (normally 2-5 minutes) prior to laryngoscopy and administration of surfactant, but do not delay once adequate sedation observed.
- Monitor for apnoea and be prepared to give IPPV.

**Part 3: Administration**

- Wash hands and wear clean gloves.
- Place baby supine, wrapped in blankets to minimise heat loss. Ensure comfort of baby – swaddling, comfort holding.
- Keep the nCPAP/HFNC$O_2$ prongs in situ and deliver the $FiO_2$ as needed guided by the baby's oxygen saturations.

- Direct or video laryngoscopy should be performed with continuous non-invasive ventilatory support that provides end-expiratory pressure to maintain alveolar aeration (nCPAP or HFNC$O_2$).
- Upper airway secretions to be suctioned as required.
- When a clear view of the vocal cords is seen the specialised LISA catheter should be inserted between 1.5-2.0cm through the vocal cords.[3]
    - < 27 weeks gestation 1.5cm beyond vocal cords
    - > 27 weeks gestation 2cm beyond vocal cords
- If the cords are adducted, withdraw catheter tip and wait for them to open. If a clear view cannot be obtained, the catheter cannot be inserted or there is a clinical deterioration, pause the procedure and remove the laryngoscope.
- Secure the LISA catheter using a finger in the midline (not side) of the mouth and then remove the laryngoscope/ videolaryngoscope. Do not leave the laryngoscope/ videolaryngoscope in place for any longer than necessary. Remove the laryngoscope carefully to avoid dislodging the catheter. Close the mouth to ensure effective end-expiratory pressure support.

- Review the insertion length of the LISA catheter at the lips, it may have moved during laryngoscope removal. Confirm appropriate position by comparing it to the length of recommended ETT insertion for gestation **(Appendix 5)** – should be equivalent +/- 0.5cm
- Hold the catheter at the lips and take note of the length at the lip; this should not change during surfactant instillation.
- Check the baby is stable and breathing.

- An assistant will be needed to help attach the syringe and give the surfactant. (If available) Attach the T-piece directly to the catheter hub, with the syringe containing surfactant attached at the other end.
- Administer surfactant slowly – at a recommended rate of 0.5-1ml/minute - whilst encouraging spontaneous breathing with gentle stimulation.[3] Each 240mg of surfactant should be administered over ~ 3 mins - followed by air to push any residual surfactant through the T-piece and into the lungs. Remove the LISA catheter once surfactant administration complete.
- Reduce rate of surfactant administration if reflux is seen or breathing becomes irregular or there is hypoxia/bradycardia. If a large amount of surfactant refluxes into the pharynx, pause and apply non-invasive respiratory support (nCPAP or $HFNCO_2$) with a closed mouth. Encourage spontaneous breathing with gentle stimulation to redirect surfactant into lungs. Avoid applying suction unless there is evidence of ongoing airway obstruction.
- Consider aspiration of the NGT during the procedure to assess whether surfactant is being delivered via the endotracheal route (via LISA catheter) and relative volume of surfactant reflux.
- During administration of surfactant titrate $FiO_2$ to maintain oxygen saturations between 90-95%. Post procedure it should be possible reduce $FiO_2$.
- If at any time there is apnoea or prolonged bradycardia or hypoxia, the procedure should be abandoned and positive pressure ventilation applied +/- consideration of intubation.

**Part 4: Post-procedure care**

- Aim to nurse the baby prone with minimal handling.
- Ensure effective non-invasive ventilatory support (nCPAP or $HFNCO_2$)
- Monitor work of breathing and oxygen saturations – targeting the appropriate saturation range for gestation.
- Reduce $FiO_2$ slowly, as per the $O_2$ target saturations. Maintain non-invasive respiratory support generating PEEP.
- Update parents regarding the procedure
- Document the procedure in the clinical notes, ensuring surfactant has been prescribed and administration recorded appropriately on the medication charts.
- If there is ongoing audit of the LISA procedures, complete audit form **(Appendix 6)**

**Troubleshooting during the LISA procedure:**

- Reduce rate of surfactant administration if reflux is seen or breathing becomes irregular, or there is hypoxia/bradycardia
- If a large amount of surfactant refluxes into the pharynx, pause and ensure continued application of non-invasive respiratory support (nCPAP with a closed mouth or HFNCO2)
- Consider aspiration of the NGT during the procedure to assess whether surfactant is being delivered via the endotracheal route (via LISA catheter) and relative volume of surfactant reflux
- Abandon the procedure and provide positive pressure ventilation if prolonged apnoea, bradycardia, or hypoxia

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London Neonatal Operational Delivery Network

## Appendix 1: LISA - Neonatal Checklist

Patient label

**Less invasive surfactant administration – North West London**

**The checklist should be filled in contemporaneously during the procedure and must be filed in the patient's notes**

| | | | |
|---|---|---|---|
| | Date of administration: _____/ _____/ _____ Time of administration: _____:_____ | | |
| Pre-procedure | Patient details confirmed | □ Yes | □ No (give reason) |
| | Ensure criteria for LISA are met and consultant is aware and approves of procedure | □ Yes | □ No (give reason) |
| | Clinical examination +/- point of care techniques to exclude significant pneumothorax | □ Yes | □ No (give reason) |
| | Ensure normothermia of baby, and measures in place to maintain normothermia during procedure | □ Yes | □ No (give reason) |
| | Ensure continuous heart rate and saturation recording | □ Yes | □ No (give reason) |
| | Prepare equipment – as per NWL guideline - including:<br>Airway trolley<br>Non-invasive positive pressure ventilation support e.g. NeoPuff®<br>Suction devices with suction catheters<br>Premedication (and giving equipment)<br>Laryngoscope (+/- video laryngoscope) with appropriate sized blade<br>Poractant alfa (Curosurf®)<br>LISA catheter<br>Surfactant administration equipment –<br>Dressing pack, 5 ml syringe, 20 G needle, T-piece / vascular device connector | □ Yes | □ No (give reason) |
| | Ensure baby stable and settled on appropriate and effective mode of non-invasive ventilation, chest visible to assess regularity and work of breathing | □ Yes | □ No (give reason) |
| | IV cannula in-situ, available and working | □ Yes | □ No (give reason) |
| | Ensure adequate neonatal comfort prior to laryngoscopy – swaddling, comfort holding. Use buccal 24% sucrose or MEBM as non-pharmacological interventions for comfort | □ Yes | □ No (give reason) |

| | | | |
|---|---|---|---|
| Procedure | Keep the nCPAP/HFNC$O_2$ prongs in situ and deliver the $FiO_2$ as needed guided by the baby's oxygen saturations. | □ Yes | □ No (give reason) |
| | Administer opiate premedication & saline flush over 3-5 minutes IV | □ Yes | □ No (give reason) |
| | Perform direct or video laryngoscopy with continuous non-invasive ventilatory support (nCPAP or HFNC$O_2$) | □ Yes | □ No (give reason) |
| | Insert LISA catheter through the vocal cords to the desired length | □ Yes | □ No (give reason) |
| | Remove laryngoscope carefully maintaining catheter position, hold the catheter at the lips maintaining target insertion length | □ Yes | □ No (give reason) |
| | Administer surfactant slowly (1ml/minute), encouraging spontaneous breathing with gentle stimulation | □ Yes | □ No (give reason) |
| | Remove the LISA catheter once surfactant administration complete | □ Yes | □ No (give reason) |
| | | | |
| Post-procedure | Ensure effective non-invasive ventilatory support (nCPAP or HFNC$O_2$) | □ Yes | □ No (give reason) |
| | Nurse the baby prone with minimal handling for the following hour | □ Yes | □ No (give reason) |
| | Monitor work of breathing, titrate $FiO_2$ to maintain target oxygen saturations | □ Yes | □ No (give reason) |
| | Document the procedure in the clinical notes | □ Yes | □ No (give reason) |
| | Ensure surfactant has been prescribed and administration recorded appropriately on the medication charts | □ Yes | □ No (give reason) |

| | | | |
|---|---|---|---|
| Performed by | Person supervising/assisting LISA: | Name and sign: | Job title: |
| | Person performing LISA: | Name and sign: | Job title: |

**Appendix 2 BAPM Neonatal Airway Safety Standard, LISA checklist example**

## Less Invasive Surfactant Administration (LISA) Checklist

**Has this infant previously been intubated or received LISA?** If so, please check their records.

| Baby's Name: |
|---|
| Hospital number: |
| DOB: |

| Does the baby meet the criteria for ventilation rather than LISA? | Has pneumothorax been considered? | Loading dose of Caffeine citrate needed? | IV antibiotics? | Consultant aware? (if applicable) |
|---|---|---|---|---|
| Y / N | Y / N | Y / N | Y / N | Y / N |

| Equipment | Patient | Team/Roles | Post LISA Notes |
|---|---|---|---|
| ☐ Laryngoscope (Video and Direct)<br>☐ Fine tracheal catheter<br>☐ Surfactant prescribed and ready<br>☐ Facemask, T-piece with correct PIP/PEEP settings.<br>☐ Working suction and catheter<br>☐ Intubation equipment available<br>☐ OG tube and syringe for aspiration<br>☐ Timer<br>☐ McGills Forceps (if used)<br>☐ Atropine prescribed and ready (if used)<br>☐ Sedative and Naloxone drugs prescribed and ready (if applicable) | ☐ Identify patient and check ID<br>☐ Parents aware<br>☐ Non-invasive respiratory support (eg.CPAP/ nHFT)<br>☐ Position baby/swaddle<br>☐ Analgesia/sedation<br>☐ Thermoregulation<br>☐ IV access<br>☐ ECG and saturation monitoring<br>☐ OG aspirated | **Team Leader:** to check sedative plan and vocalise escalation plan<br><br>**Airway:** insert Surfactant catheter<br><br>**Drug administration:** administer sedative drugs (if used) and assist in Surfactant administration<br><br>**Patient comfort:** non-pharmacological comfort measures and suction<br><br>**Patient observation:** monitor observations and OG aspiration | **Catheter inserted by** (name and role):<br><br>Catheter insertion length post vocal cords:<br>**1.5cm for babies < 27 weeks**<br>**2cm for babies >27 weeks**<br>Note: Black tip on surfcath is 2cm, Ensure 0.5cm black tip visible above vocal cords in babies <27 weeks.<br><br>Amount of Surfactant aspirated from the OG tube in mL:<br><br>**Any complications occurring during the procedure to be documented here:** |

**Checklist completed by (name & role):**

**Signature:**

**Date:**

British Association of Perinatal Medicine

**Appendix F** - Less Invasive Surfactant Administration (LISA) Checklist, © BAPM, 2024

**Appendix 3 – Suggested surfactant dosing regime where the birth weight is unknown (target ~ 200mg/kg Curosurf® administration)**

| Gestational age | Curosurf dose |
|---|---|
| 25+0 → 27+6 weeks | 120mg |
| 28+0 → 29+6 weeks | 240mg |
| 30+0 → 33+6 weeks | 360mg |
| 34+0 → 36+6 weeks | 480mg |
| >37+0 weeks | 600mg |

**Appendix 4 – Fentanyl premedication for sedation for LISA**

## Fentanyl for LISA

**Initial dose**:
0.7 micrograms/kg/dose as an IV bolus over 3 – 5 minutes.
In order to give as a slow IV bolus, dilute in either sodium chloride 0.9% or glucose 5% (as below)

**Calculations based on solution diluted to 5 micrograms in 1mL**

**To obtain this solution,**
**mix 0.25mL of fentanyl injection 100micrograms in 2mL with 2.25mL sodium chloride 0.9% or glucose 5% to produce a solution of 5micrograms in 1mL**

| Baby's birth weight (kg) | Fentanyl dose in micrograms | Volume in mLs of diluted fentanyl | Volume in mLs of diluent (sodium chloride 0.9% or glucose 5% | Total volume to be given |
|---|---|---|---|---|
| Up to 1 | 0.5 | 0.1 mL | 1 | 1.1 mL |
| 1.01 - 1.5 | 1 | 0.2 mL | 1 | 1.2 mL |
| 1.51 – 2 | 1.5 | 0.3 mL | 1 | 1.3 mL |
| 2.01 – 3 | 2 | 0.4 mL | 1 | 1.4 mL |
| 3.01 -3.5 | 2.5 | 0.5 mL | 1 | 1.5 mL |
| 3.51 - 4.5 | 3 | 0.6 mL | 1 | 1.6 mL |
| 4.51 - 5 | 3.5 | 0.7 mL | 1 | 1.7 mL |

## Appendix 5 - ETT / LISA catheter insertion length to be inserted*

| ETT / LISA length at lips (cm) | Corrected gestation (weeks) | Actual or estimated weight (kg) |
|---|---|---|
| 5.5 | 23–24 | 0.5–0.6 |
| 6.0 | 25–26 | 0.7–0.8 |
| 6.5 | 27–29 | 0.9–1.0 |
| 7.0 | 30–32 | 1.1–1.4 |
| 7.5 | 33–34 | 1.5–1.8 |
| 8.0 | 35–37 | 1.9–2.4 |
| 8.5 | 38–40 | 2.5–3.1 |
| 9.0 | 41–43 | 3.2–4.2 |

ETT – Endotracheal tube, LISA - Less Invasive Surfactant Administration

*Adapted from Kempley ST, Moreiras JW, Petrone FL. Endotracheal tube length for neonatal intubation. Resuscitation 2008;77:369–73.