1. Introduction

Non-bronchoscopic bronchoalveolar lavage (NBBAL) has developed a role in the evaluation of respiratory infections in ventilated patients. NBBAL is a minimally invasive and relatively inexpensive technique. NBBAL is becoming increasingly popular on paediatric intensive care units. Guideline gives rationale and technique for NBBAL in ventilated patients for all nursing, medical and allied health professional staff on PICU. This guideline has been developed in conjunction and agreement with the paediatric physiotherapy team and should be viewed alongside the guideline UHL C47/2016 Prevention of Ventilator Associated Pneumonia UHL Childrens Intensive Care Guideline

2. Non-bronchoscopic bronchoalveolar lavage

Indications
- To obtain secretion samples to aid in diagnosis
- New admission onto PICU with an undiagnosed respiratory condition
- Suspected Community Acquired Pneumonia / Ventilator Acquired Pneumonia
- To enable the safe instillation of saline to assist in the treatment and clearance of secretions
Contraindications
- Profound hypoxia (PaO2 < 7KPa or < 4 KPa in cyanotic CHD)
- Severe pulmonary hypertension or risk of pulmonary hypertensive crisis
- Pneumothorax
- Raised ICP
- Acute pulmonary oedema
- Active seizures

Precautions
- Cardiovascular instability
- Deranged coagulation
- Pulmonary Haemorrhage
- Severe acute asthma
- High pressures on ventilator or risk of derecruitment

Complications
- Vaso vagal response
- Mucosal trauma
- Hypoxia
- Bronchospasm
- Pneumothorax
- Haemorrhage
- Haemodynamic instability
- Arrhythmias
- Altered ICP

PREPARATION OF EQUIPMENT

Good preparation helps to avoid the possible complications listed as well as reducing the amount of stress to the child and parents

A senior physiotherapist (Band 6)/ Clinical Specialist Physiotherapist (Band 7) / nurse / medic competent in this technique should be performing this technique, with a second person to assist.
**NBBAL PROCEDURE**

1. Seek and document consent from the parents/carers, if possible. If parents/carers are not present consent must be documented ‘in the patient’s best interest’
2. Inform the nurse in charge and medical staff that you are doing the procedure.
3. Complete and document a respiratory assessment of the child. Document all observations including ventilator settings, saturations, BP, HR, ETCO₂
4. Wash hands and wear gloves
5. Set up all the equipment as shown above.
   - NG tube size is double the size of the ETT
   - Use 1 ml/kg of 0.9% sodium chloride (maximum 10 ml).
6. Ensure the child is adequately sedated and paralysed so they will not cough/move during the procedure
7. Prime the NG tube (catheter) with the correct amount of 0.9% Sodium chloride adding 1 ml of air (to push all the fluid through)
8. Position the child supine with the head in the midline if a multi-pathology or if unilateral pathology then position head to the contra-lateral side (e.g. if right side pathology then position head to the left).
9. Manually inflate the child’s lungs during the procedure
10. Insert NG tube (catheter) down the ETT, via the valve connector opening on the bagging circuit
11. Stop manually inflating. Instill the 0.9% sodium chloride
12. Wait for 2 seconds then give two manual inflation breaths
13. Turn the 3 way tap to allow suction and gain the sample
14. Apply suction pressure as appropriate for child’s age and collect sample. Suction should not be applied as the catheter is withdrawn. Ensure sputum trap is held the right way up or sample will be lost
15. Continue bagging. Repeat if more samples are required and the procedure is being tolerated by the patient. (maximum of 5 times)

**3. Education and Training**

Training and raising awareness are on-going processes. On-going awareness is promoted through the induction and continuous bedside teaching. Training is provided for medical staff during lunchtime teaching (Wednesdays) and other sessions, and at junior doctors’ induction training. Nursing education is supported by the Practice Development teams, and nursing educators.

Senior Physiotherapists and Clinical Specialist Physiotherapists are expected to undertake initial training and then maintenance of competency training (see appendix 1 for example of assessment document) on an annual basis as per the Policy for Respiratory Physiotherapy On-Call and Respiratory Physiotherapy Weekend and Bank Holiday Service Trust reference C16/2017
4. Monitoring Compliance

None identified at present

<table>
<thead>
<tr>
<th>What will be measured to monitor compliance</th>
<th>How will compliance be monitored</th>
<th>Monitoring Lead</th>
<th>Frequency</th>
<th>Reporting arrangements</th>
</tr>
</thead>
</table>

5. Supporting References


6. Key Words

Non bronchoscopic bronchoalveolar lavage, BAL

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.

As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.
CONTACT AND REVIEW DETAILS

<table>
<thead>
<tr>
<th>Guideline Lead (Name and Title)</th>
<th>Executive Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kay Calvert – Clinical Specialist Physiotherapist</td>
<td>Chief Nurse</td>
</tr>
</tbody>
</table>

Details of Changes made during review:

**Contraindications** – Added:
- risk of pulmonary hypertensive crisis
- Precautions - risk of derecruitment
- Preparation - A senior physiotherapist *(Band 6)/ Clinical Specialist Physiotherapist (Band 7)* / nurse / medic competent in this technique should be performing this technique

**Preparation**
- A senior physiotherapist *(Band 6)/ Clinical Specialist Physiotherapist (Band 7)* / nurse / medic competent in this technique should be performing this technique

**Added images of equipment**

**Procedure** – Added:
- If parents/carers are not present consent must be documented ‘in the patient’s best interest’
- Complete and document a respiratory assessment of the child. Document all observations including ventilator settings, saturations, BP, HR, ETCO₂
- NG tube size is double the size of the ET
- Ensure the child is adequately sedated and paralysed

**Removed** –
- Inform Senior nurse/nurse in charge that you are doing the procedure
- Discuss with medical staff if they require a bolus of sedation or use of ketamine
- Check weight of child
- Complete a respiratory assessment
- If doing a therapeutic NBBAL, instil the saline, withdraw the catheter/ NG
- If doing a therapeutic NBBAL, instil the saline, withdraw the catheter/ NG without suction, change the patients position so that treatment can be carried out i.e. manual techniques, bagging etc… then collect the sample if required.
- Post-oxygenate once back on ventilator, if required
- Collect HR, BP, saturations and ventilator observations post treatment. Send the sample immediately to microbiology for MC&S

**Added training and equipment competency assessment form (appendix 1)**

**Removed previous monitoring criteria**

**Added Keywords**

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Title: Non Bronchoscopic Bronchoalveolar Lavage UHL Childrens Intensive Care Guideline
V:3 Approved by: PICU clinical practice group: November 2019
Trust Ref No:C47/2016

NB: Paper copies of this document may not be most recent version. The definitive version is held in the policy and guidelines library.
## Equipment competency

<table>
<thead>
<tr>
<th>Non-Bronchoscopic Bronchoalveolar Lavage (NBBL)</th>
<th>NAME:</th>
<th>GRADE:</th>
<th>SITE:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>Signature Assessee</th>
<th>Signature Assessor</th>
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</thead>
<tbody>
<tr>
<td>Can identify indications for use of equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can identify contraindications for use of equipment</td>
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<tr>
<td>Can undertake the necessary safety checks and precautions</td>
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<tr>
<td>Can demonstrate appropriate preparation of the environment</td>
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<tr>
<td>Can demonstrate appropriate setting up of the equipment</td>
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<tr>
<td>Can demonstrate appropriate preparation of the dose(s)</td>
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<tr>
<td>Can demonstrate the different treatment techniques for this equipment</td>
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<tr>
<td>Knows information to be given to patient prior to, during and after treatment</td>
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<tr>
<td>Can demonstrate making accurate treatment records</td>
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<tr>
<td>Can demonstrate how to evaluate the effectiveness of the treatment</td>
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</tbody>
</table>

**Assessee:** I am aware that I should only carry out the techniques that I have been taught and will seek further training/advice as required. It is my responsibility to maintain my own competence on an annual basis.

Signed……………………………………Print……………………………………
Designation…………………………… Date……………………………………

**Assessor**
Signed……………………………………Print……………………………………
Designation…………………………… Date……………………………………