GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Caerdydd a'r Fro
Cardiff and Vale University Health Board
Noah's Ark Children's Hospital for Wales
Ysbyty Plant Cymru
Department of Paediatric Respiratory Medicine and Cystic Fibrosis

Insert Child's Addressograph or Details Here

Guideline for the use of Nasopharyngeal Airways (NPA) in Children

Introduction

The purpose of this guideline is to provide information on the non-emergency use of Nasopharyngeal Airways (NPA) in children at the Noah's Ark Children's Hospital for Wales. It has been adapted from the Great Ormond Street Hospital for Children guideline. It is for the use of healthcare professionals looking after children under the care of the Paediatric Respiratory Medicine team.

An NPA is a flexible tube that is designed to maintain an open channel between the nostril and the nasopharynx, and to bypass upper airway obstruction at the level of the nose, nasopharynx or base of the tongue.

A correctly placed NPA should sit above the epiglottis, having separated the soft palate from the posterior wall of the oropharynx. It is important to be aware of this, as it will enable correct sizing of the NPA. If the NPA is too short it will fail to separate the soft palate from the pharynx, and if it is too long will pass into the larynx and stimulate cough and gag reflexes.

NPAs are generally well tolerated by conscious children, and are used in the management of congenital maxillofacial abnormalities, syndromic craniosynotosis, mid-facial hypoplasia or to support the upper airway post-trauma or surgery. NPAs are also used in emergency resuscitation situations, but this is beyond the scope of this guideline. For further guidance in these situations please refer to Advanced Paediatric Life Support guidelines.

Indications for an NPA

Pierre Robin Sequence:

A child with Pierre Robin Sequence (PRS) is characterised by:

- Micrognathia (an unusually small mandible),
- Glossoptosis (posterior displacement or retraction of the tongue),
- Upper airway obstruction.
- Cleft palate (incomplete closure of the roof of the mouth) is also present in the majority of patients.

In PRS, airway obstruction is mostly due to glossoptosis (with the tongue occluding the airway) result in breathing difficulty. This upper airway obstruction impedes

airflow to the lungs, resulting in increased inspiratory effort. This often worsens the degree of obstruction, as increasing intra-thoracic pressures collapse the soft tissue structures of the airway inwards.

The airway obstruction may be intermittent and may take time to develop. Some infants may not present for days to weeks after birth, most commonly with faltering growth due ongoing increased work of breathing.
PRS may be a part of other syndrome including Stickler, Treacher-Collins and Velo-cardiofacial syndromes.

Craniofacial syndromes:

Children with craniofacial syndromes such as Apert, Crouzon and Pfeiffer, may have an NPA for the treatment of obstructive sleep apnoea (OSA). In these children, and NPA may be used for months or years and often allows the avoidance of a tracheostomy.
These syndromes are typified by a mid-facial hypoplasia which includes narrowed nasal passages, underdeveloped and setback mid-facial skeletal structures and malocclusion of the upper and lower jaws. Position of the tongue can also contribute the airway obstruction.
Children may present with symptoms of upper airway obstruction, sleep difficulties, feeding difficulties and faltering growth.

Post-adenotonsillectomy:

Children with OSA are at risk of respiratory compromise following an adenotonsillectomy caused by post-operative oedema in the pharynx/larynx.
This group of children usually only require an NPA for one or two nights post-operatively, and should be considered in patients with a history of a narrow mid-face, cerebral palsy/neurological compromise and sickle cell disease (to avoid hypoxia).

Post-cleft lip and palate repair:

Occasionally a baby undergoing a unilateral or bilateral repair with anterior palate repair (vomerine flap) may require an NPA post-operatively. Often babies with PRS will have an NPA post-operatively, due to closure of palate and post-operative oedema potentially causing airway obstruction.
NPAs placed by the surgical team (ENT/Cleft) will usually be sized by the surgeons in theatre.

Sizing of the NPA

For those having an NPA inserted under the care of the Paediatric Respiratory Medicine team, the size and length of the NPA is determined by:

- Obtaining the child's crown-to-heel length (as there is a positive correlation between this and the length of the NPA) – see Appendix for chart.
- In neonates, 7cm is normally a good starting insertion length. Final insertion length can then be individually tailored based on relief of respiratory effort, or if the child starts coughing/gagging.
- Referring to a lateral neck X-ray if possible.
- Clinical assessment.

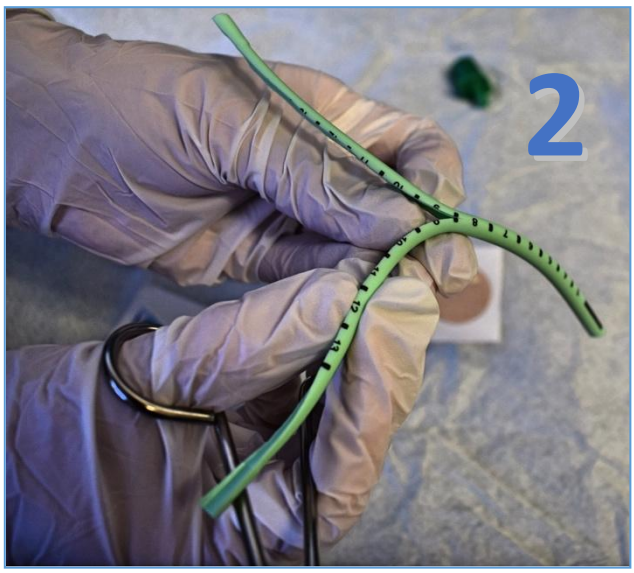
When measuring the length of the NPA required, measure from the distal tip of the tube, not the start of the opening of the bevel.
It is also important to select the correct diameter of endotracheal (ET) tube to make the NPA. If the airway is too narrow it will fail to relieve the obstruction. If it is too wide, it may cause pressure on the skin/mucosa and lead to tissue breakdown.

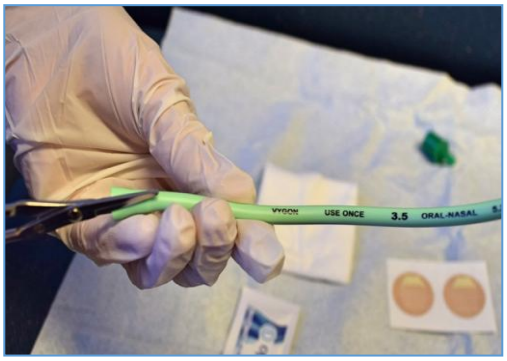
Making an NPA:

NPAs are either fashioned from a hard plastic or soft plastic uncuffed endotracheal tube. For long-term NPAs a soft endotracheal tube is preferable. For neonates, starting with a tube with an internal diameter of 3mm, 3.5mm or 4mm is usual. As the child grows, tubes with a larger internal diameter may be required.

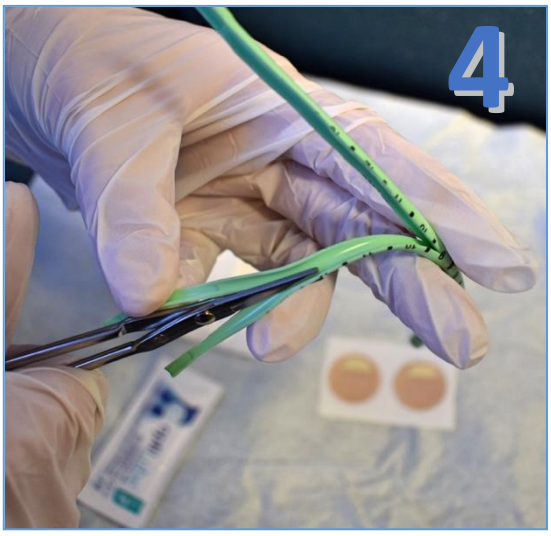
Step 1: Assemble necessary equipment in clean environment. Measure length of NPA required from the tip of the tube.

Remove the connector from the end of the tube, and make two cuts down opposite sides of the endotracheal tube until the desired insertion length is reached. Do **not** cut off the 'flaps' created on the tube by this process, as these will be used to secure the tube to the cheeks.





Step 2 and 3: Position NPA in same plane as insertion, and cut down along the top of the NPA to the desired length.
Step 4: Once top side of NPA cut, turn NPA over and cut down the opposite side.
Step 5: Two 'flaps' should have been created.



Step 6: Trim the excess plastic from the securing 'flaps'. This will help make securing the NPA easier and make it more comfortable.
Step 7: NPA complete and ready for insertion.

Insertion of an NPA

Placement:

- The right sided nostril is almost always used. This is because the natural curve and bevel of the ET tube will result in the NPA opening into the pharynx as opposed to the wall of pharynx.
- Insertion of the NPA should be parallel to the nasal floor, rather than upwards to the cribriform plate. An NPA should insert with minimal resistance. Do not force an NPA in as this may result in pain, trauma, bleeding and swelling of the upper airway.

Insertion:

- Insertion of an NPA should be a clean procedure, so therefore hand hygiene and personal protective equipment should be applied.
- If appropriate, ensure that the child is swaddled.
- Ensure the child's nostrils are clear from secretions. Suction if required.
- Ensure oxygen and suction are available at the bedside.
- Lubricate and insert NPA gently into the nostril. Insert the tip of the tube into the right hand nostril, then gently thread the tube along the floor of the nasal passage, perpendicular to the face, until the flaps rest gently against the opening of the nostril.
- If you are unable to insert the NPA consider:
    - Summoning more experienced help,
    - Using an NPA with a smaller internal diameter,
    - Consider using an NG tube as a 'bougie' to guide the NPA in.
    - Steroid-based nasal drops to assist with insertion,

- Insertion in theatre under direct vision, with or without general anaesthetic.
- Once inserted, secure the NPA with the appropriate dressing.
- Once secure, record the procedure, tube diameter and insertion length in the child's medical records.

Insert NPA into right nostril, with bevel facing into the pharynx space.

The appearance of a successfully inserted and secured NPA.

Monitoring:

- Whilst passing the NPA observe for any undue respiratory distress as evidenced by:
  - Child's general behaviour/colour
  - Oxygen saturations
  - Respiratory rate and effort
  - Heart rate
- If present, stop the procedure immediately and treat accordingly. Request assistance as appropriate.
- Immediately after successful insertion observe for:
  - Excessive bleeding from the nostril – contact medical team if persisting
  - Patency with suctioning
  - Improvement in respiratory symptoms and observations
- Monitor for blanching of the nares – leading to pressure injury or skin breakdown around the nostril rim.
- Observe for any milk/feed coming up the NPA during or after feeds, as this may indicate the NPA is too long and impairing the child's ability to swallow. If this occurs, keep the child nil by mouth until medical review.

Securing an NPA:

- Once the tube has been inserted to the desired length, there will be two 'flaps' left protruding from the nose. These can be reflected back onto the child's cheeks and secured with an appropriate dressing e.g. Hypafix tape or 'Rose-Ann' dots.

Care of long-term NPAs

Nursing input in the care of children with long term NPAs is focused in three areas:

- Maintaining correct positioning and patency of the NPA,
- Skin integrity,
- Parental teaching to support safe discharge.

Maintaining NPA:

- Parent should be taught how to check for correct positioning of the NPA and for the signs and symptoms of NPA occlusion and how to respond. Please see competencies document for further information.
- NPAs can be washed after removal for reuse with warm soapy water.
- Insertion of a newly made NPA is recommended once a week.

Care of the skin:

- Clean the nostrils as required to prevent excoriation.
- Care of dressings and underlying skin. Adhesive tapes used in securing NPAs are strong and preventative measure should be taken to protect underlying skin.
- Observe pressure areas for evidence of skin redness or breakdown. This is particularly important around the nostrils.

Suctioning:

- Care should be taken when suctioning NPAs, as inappropriate technique can result in complications, especially atelectasis, hypoxia or cardiovascular changes.
- NPAs only usually need routine suctioning during the first few days of insertion. After this time they should be suctioned only infrequently as required.
- The healthcare professional suctioning the NPA needs to know the insertion length. Too short a suction length can leave the NPA blocked, whereas too long a suction length can lead to trauma to the soft structures of the pharynx/larynx.
- Suctioning should be quick but effective enough to remove secretions and minimise complications.
- Professionals should only touch the proximal end of the suction catheter to minimise contamination.
- Instillation of saline drops has little evidence to support its practice, and is not recommended routinely.
- It is important that the child remains systemically well hydrated, and fluid requirements may have to be increased during inter-current illnesses.

Discharge:

- Parents will require training in the care and replacement of the NPA and will need to be supplied with the relevant equipment at home (such as portable suction, suction catheters, replacement NPAs).
- Parents will also require training in nasogastric tube feeding and pulse oximetry.
- Parents require basic life support training prior to discharge.
- The child will require a car seat challenge prior to discharge.

- The child's local hospital paediatric team and/or community team will also need to be informed of the NPA and supplied with a care plan and equipment list.
- Please refer to the discharge checklist supplied with this guideline for further information.

Paediatric Nasopharyngeal Airway Equipment List:

Insert Child's Addressograph or Details Here

This child has a long-term nasopharyngeal airway in situ and the following equipment needs to be supplied to the family to ensure a safe discharge home.

Monitoring:

- ☐ Pulse oximeter

Suction Equipment:

- ☐ Please arrange for the local paediatric community service to provide a portable suction unit in line with their local policy.
  If the child is from the Cardiff region, then the Laerdal portable suction unit will be provided by the Cardiff community team.

Disposables:

- ☐ ……. endotracheal tubes – size…….. (to be changed weekly/monthly) *delete as appropriate.
- ☐ Suction catheters, size……, approx. ……. used per week.
- ☐ Suction connection tubing (changed as per local team guidelines).
- ☐ Gauze pads (pack of 5)
- ☐ Scissors (double round ended)
- ☐ Water based lubricant
- ☐ Dressings/fixings

Insert Child's Addressograph or Details Here	**Child's Named Consultant:** **Ward:**

Paediatric Nasopharyngeal Airways: Carer Competencies and Discharge Planning Checklist:

This document is intended to guide the training/teaching for parents/carers to safely manage their child's nasopharyngeal airway in the community. As part of this process, it defines some necessary competencies that the carer will need to achieve to allow a safe discharge home. The trainer needs to initial each performance criteria once completed by the carer. Please enter comments as required.

First carer's name: *Relationship to child:*	
Second carer's name: *Relationship to child:*	

Training Schedule:

Time & Date	Session	Carer and Trainer	Initial

Suctioning:

Performance Criteria:

	Carer 1	Carer 2
Carer is able to identify the need for suctioning and is aware of potential complications. *Remarks:*		

	Carer 1	Carer 2
Carer is able to recognise when their child needs suctioning and is able to correctly use the equipment. *Remarks:*		

	Carer 1	Carer 2
Carer is able to demonstrate the correct method and technique of suctioning. *Remarks:*		

	Carer 1	Carer 2
Carer is able to safely recognise the need for suctioning, and is able to independently carry out suctioning applying the correct technique throughout. *Remarks:*		

Evaluation of training:

When both carers and practitioners are satisfied that the recognition of when suctioning is indicated, the suctioning technique is correct, and carers can perform suctioning safely and independently, please sign below:

Carer 1:	**Date:**
Carer 2:	**Date:**
Trainer:	**Date:**

Caring for a Nasopharyngeal Airway (NPA):

Performance Criteria:

	Carer 1	Carer 2
Carer is aware of the need to change dressings/tapes to ensure NPA is adequately secured. *Remarks:*		
	Carer 1	**Carer 2**
Carer observes changing of NPA tapes and hygiene care of skin and nostrils. *Remarks:*		
	Carer 1	**Carer 2**
Carer is able to carry out dressing/tape changes and hygiene carers of skin and nostrils with assistance. *Remarks:*		
	Carer 1	**Carer 2**
Carer is able to safely carry out dressing/tape changes and hygiene cares of skin and nostrils independently. *Remarks:*		

Evaluation of training:

When both carers and practitioners are satisfied that the technique of dressing/tape changes and hygiene care has been carried out competently and allows independent practice, please sign below:

Carer 1:	**Date:**
Carer 2:	**Date:**

Trainer:	Date:

Making a Nasopharyngeal Airway (NPA):

Performance Criteria:

	Carer 1	Carer 2
Carer is shown how to prepare all of the equipment to make a NPA and observes one being made. *Remarks:*		
	Carer 1	**Carer 2**
Carer can prepare and make a NPA with assistance. *Remarks:*		
	Carer 1	**Carer 2**
Carer can prepare and make a NPA independently. *Remarks:*		

Evaluation of training:

When both carers and practitioners are satisfied that the technique of making a new NPA can be carried out competently and independently, please sign below:

Carer 1:	**Date:**
Carer 2:	**Date:**
Trainer:	**Date:**

Inserting a Nasopharyngeal Airway (NPA):

Performance Criteria:

	Carer 1	Carer 2
Carer is able to identify the size and length of NPA in use and how often it needs to be changed *Remarks:*		
	Carer 1	**Carer 2**
Carer is able to recognise the need for a routine and/or emergency change of NPA. *Remarks:*		
	Carer 1	**Carer 2**
Carer is has observed an NPA change and is able to demonstrate correct positioning and preparation of equipment. *Remarks:*		
	Carer 1	**Carer 2**
Carer is able to undertake an NPA change with assistance. *Remarks:*		
	Carer 1	**Carer 2**
Carer is able to insert/change an NPA independently on at least two occasions *Remarks:*		

Evaluation of training:

When both carers and practitioners are satisfied that the recognition of when suctioning is indicated, the suctioning technique is correct, and carers can perform suctioning safely and independently, please sign below:

Carer 1:	**Date:**
Carer 2:	**Date:**
Trainer:	**Date:**

Emergency Care of a Nasopharyngeal Airway (NPA):

Performance Criteria:

	Carer 1	Carer 2
Carer is aware of potential emergency situations relating to an NPA. *Remarks:*		

	Carer 1	Carer 2
Carer can identify and correctly use emergency equipment, and is aware of what equipment should be carried with the child. *Remarks:*		

	Carer 1	Carer 2
Carer to be taught Basic Life Support and to practice on a manikin. *Remarks:*		

	Carer 1	Carer 2
Carer knows the action to take on a blocked tube, and the action to take if a new tube cannot be inserted. *Remarks:*		

Evaluation of training:

When both carers and practitioners are satisfied that the technique of making a new NPA can be carried out competently and independently, please sign below:

Carer 1:	**Date:**
Carer 2:	**Date:**
Trainer:	**Date:**

Statement of Competence:

Concerning:

Insert Child's Addressograph or Details Here

I agree that I have received full training and now feel comfortable and competent to provide care for my child's nasopharyngeal airway independently.

Carer 1: ***Please print name***	
Signature	**Date:**

Carer 2: ***Please print name***	
Signature	**Date:**

I confirm that the above carers are competent in the care of nasopharyngeal airways:

Trainer Name:	**Position:**
Signature	**Date:**

Appendix: Information Sheet for Cot Space/Parents:

Managing an NPA on the ward

Children's Hospital for Wales
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Cardiff and Vale University Health Board

respiratory nurse (02920) 742116
paediatric respiratory consultant (02920) 747747

Background information

• Managing an infant with micrognathia with or without a cleft palate often involves the use of a nasopharyngeal airway
• Usually for children without complex conditions, the problems resolves with growth: by 6 months the NPA can be taken out during the day, and by 9-12 months the NPA can usually be taken out at nighttime.
• Whilst the NPA is in situ most children will be fed by NG tube except for small tastes to try and avoid oral aversion.

Ward management of an infant with Nasopharyngeal airway

•These infants may have profound obstruction when asleep without the NPA in situ, but usually when they are awake and settled with quiet breathing, they breathe quite well.
• Problems arise if these infants become unsettled, uncomfortable or cry, as breathing hard may cause the soft structures of the airway to collapse in and cause obstruction even with the NPA in situ.

ONE OF THE CARDINAL ELEMENTS OF MANAGING A CHILD WITH AN NP AIRWAY IS MINIMAL HANDLING

• In a situation where the infant is unsettled and it is not clear why, it is important to check that the NP airway is not blocked.
• Parents are generally expert at managing their child's airway so involve them.
• Try suctioning **once** down the airway. (Repeated suctioning can be irritating and upset the infant so try to avoid. It also tends to produce more secretions.)
• If there is no improvement then the quickest and easiest approach to restoring a functioning NP airway and regaining a settled situation is to remove and replace the airway immediately .
• These children can generally manage without the nasopharyngeal airway for a few minutes so there is no rush – take your time
• The NP airways can be washed in warm water
• Always use a flexible green VIGON airway – wash in warm water and reuse the existing tube or use the spare tube which is hanging on the cot.
• Do not decide to use a rigid Portex ETT tube – this is not flexible and will be difficult and traumatic to pass thereby exacerbating the situation.
• Call the respiratory team

Last updated 17/11/2016

Dr Julian Forton 17/7/2018

Picture 1 Appendix: Crown-Heel Chart