

GUIDELINES ON THE MANAGEMENT OF ENTERAL FEEDING: Nasogastric Tube Placement & Nasogastric Feeding


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Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

CONTENTS

		Page Number
1.0	Introduction	3
2.0	Definition of Guideline	3
3.0	Definitions / Terms	3
4.0	Applicable to	3
5.0	Objectives of the Guideline	3
	Guidelines	
	6.1 Purpose of nasogastric tube feeding	
	6.2 Types of nasogastric tubes	
6.0	6.3 Preparation of environment, child/infant and equipment	4
	6.4 Measuring and inserting a nasogastric tube	
	6.5 Clarifying tube placement	
	6.6 setting up and administering a nasogastric feed	
	6.7 Removing a nasogastric tube	
7.0	Special Consideration	13
8.0	Companion Documents	13
9.0	Implementation Plan	14
10.0	References	14
11.0	Appendices	16

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

1.0 Introduction

Enteral feeding is an artificial method of providing a child/infant with nutrition via a nasogastric tube or gastrostomy (Bunford 2010). A nasogastric tube is a polyvinyl or polyurethane tube that is passed through the nose and oesophagus and into the stomach (Clynes & O'Connor 2010).

Some infants and children require nasogastric tube feeding because they are unable to take nourishment orally due to conditions such as anomalies of the throat, oesophagus or bowel, or impaired swallowing capacity.

2.0 Definition of Guidelines

Guidelines represent the written instructions about how to ensure high quality services are delivered. Guidelines must be accurate, up to date, evidence-based, easy to understand, non-ambiguous and emphasise safety. When followed they should lead to the required standards of performance.

3.0 Applicable to

All nursing staff who pass, access and administer food/medication via a nasogastric tube


4.0 Objectives of the Guidelines

The purpose of the guideline is to promote safe, effective and consistent practice in relation to Nasogastric tube placements and Nasogastric Tube Feeding

5.0 Definitions / Terms

Nasogastric Tube: A nasogastric tube is a narrow bore tube passed into the stomach via the nose. It is used for short- or medium-term nutritional support and administration of medications, and also for aspiration of stomach contents and decompression of the stomach

Nasogastric Feeding: Nutrition support provided through a tube inserted through the nose via the oesophagus into the stomach

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

6.0 Guidelines

6.1 Purpose of Nasogastric Tube Feeding:

Children may be unable to feed orally for the following reasons:

- The child is unable to ingest sufficient nutrition for normal growth and development in acute or chronic illness.
- The child is unable to absorb sufficient nutrients from their food
- Poorly developed or inadequate swallowing reflexes.
- Anorexia or vomiting due to treatment regime e.g.: chemotherapy congenital heart disease, renal disease (Great Ormond Street Hospital (GOSH 2012)

Contraindications to Inserting Nasogastric Tube (Shlamovitz 2013)

- Gastroesophageal surgery or trauma to the gastrointestinal tract.
- Trauma / Surgery to the Face or neck (nasopharyngeal, upper airway, laryngeal or corrective surgery. Laryngeal Surgery (including tracheostomy)
- If Tracheostomy present - if child returns from surgery with a nasogastric tube, and it becomes misplaced, it should not be re-passed without prior discussion with the Consultant, who will normally decide this post operatively, refer to post-operative notes
- Structural defects (for example: fractured base of skull, fracture of face or nose, deviated septum, tracheal-oesophageal fistulas).
- Post surgical repair of cleft palate (should not be passed without consultation with plastics team)
- Craniofacial surgery.
- Unconscious patient - absent gag reflex. (in the Emergency Department, consult with medical staff)


Any child / infant who has upper airway anomalies or who could be included in the above list should have a check x-ray to confirm the position of the tube following passing of nasogastric tube.

6.2 Types of Nasogastric tubes:

There are two main types of nasogastric tubes- a polyvinyl chloride (PVC) feeding tube and polyurethane (PU) feeding tube (Bunford 2010). All NG tubes passed in OLCHC are SINGLE USE ONLY (Infection Control Department 2012).

Table 1

<u>TYPE OF NG TUBES</u>	<u>LONG/SHORT TERM</u>	<u>LENGTH OF TIME FOR USE (AFTER INSERTION)</u>	<u>TYPE OF LUBRICANT</u>	<u>PRESENCE OF GUIDE WIRE</u>
Polyvinyl Chloride (PVC) Feeding Tube	Short term tubes	7-10 days, as per manufacturer	Sterile water	No
Polyurethane (PU) Feeding Tube	long-term tubes	For up to 30 days, as per manufacturer	Sterile water	No

Our Lady's Children's Hospital, Crumlin		 <p>Ospidéal Mhúire na Leanaí, Croughlinn</p> <p>Our Lady's Children's Hospital, Crumlin</p>
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

Fine Bore Feeding Tube (Polyurethane (PU)/ silk tube)	long-term tubes	For up to 6 weeks, as per manufacturer	Pre-insertion: Lubrication present within tip of tube. To activate lubricant: dip tip in sterile water. Internal lubricant- must be activated prior to removal of guide wire. Flush side arm access port with 10mls of sterile water. Confirm tube position prior to flushing tube with water.	Yes. Optional to use - may not be required in a conscious, cooperative patient.
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6.3 Preparation of the environment, child/infant and equipment

Equipment:


- Plastic apron
- Disposable latex free gloves
- 2 enteral Syringes 10/20ml syringe for PVC tube or 50/60ml for a polyurethane tube.

NOTE: The polyurethane tube is softer and more prone to damage. The smaller the syringe the greater the suction which, in turn may damage the tube. Please refer to manufacturer's guidelines for the most suitable syringe (Trigg & Mohammed 2010).

- pH paper (range 0-6)
- Sterile water for flushing the tube
- Naso-gastric tube (appropriate size & type)
- Hypoallergenic tape (see appendix 2 for patients with Epidermolysis Bullosa)
- Skin protector (e.g. Cavilion®, Duoderm®)
- Nasal tray
- Oral tray, include toothbrush/toothpaste as appropriate to child's age
- Emesis bowl, tissues
- Soother, if used by infant
- Sublingual sucrose if prescribed. (suitable only for infants under 6months) (OLCHC, 2014)

The size of an NG tube should be determined by clinical assessment based on type of feed, size of child and clinical need and in collaboration with the dietician and medical team.


Action:	Rationale & Reference:
Passing a nasogastric tube may be 1-2 person procedure depending on size of infant/child.	The insertion of an NG tube can be traumatic. For this reason the assistance of a second person can help relax and distract the child (Howe et al 2010).
Explain procedure to child / parents / carers. Obtain verbal consent from the parents/guardians and child as appropriate	Explanations can gain co-operation and trust and allay fears (Ball et al 2012). Obtain verbal consent from the parents/guardians
Gather equipment & ensure it is intact.	To prepare environment (Trigg & Mohammed 2010)
Decontaminate hands thoroughly and put on disposable plastic apron. Use Aseptic Non-Touch Technique (ANTT) level 3 here and throughout the procedure.	Prevention of cross infection (SARI HSE 2009, Infection Control Department 2013, OLCHC 2013)


Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	


Ensure with the PU tube (silk tube) that the guide wire is not bent and that it is correctly inserted into the middle of the tube.	To prevent injury from guide wire (Clynes and O'Connor 2010).
Arrange assembled equipment, open packages and cut tape & dressing to correct size. Draw up flush of correct volume for type of nasogastric tube as per manufacturer's guidelines.	
Attend to nasal care and oral hygiene needs.	As infants are nasal breathers, obstruction to the other nostril may affect their patent airway (Clynes & O'Connor 2010) Therefore it is important to remove debris and organisms from around the nose and mouth.
Sublingual sucrose can be given immediately prior to and during NG insertion in infants up to 6 months . Offer soother to infant if appropriate.	In order to reduce pain and provide comfort. Non-nutritive sucking enhances analgesic effect of sucrose. (OLCHC Hospital Formulary 2014)
Elevate the head of the bed. Position the infant/child with assistance, if appropriate (parent/staff member), so that the nostril can be easily accessed. Position them by placing them on their side or back on the elevated part of the bed. Restrain hands by wrapping the infant in a baby blanket. Younger children may have to be held.	To allow easier swallowing to facilitate passage of the tube (Dougherty & Lister 2011) Holding the infant/child securely will help to prevent movement and injury to the child during the procedure. It will also ensure that the procedure is carried out swiftly therefore causing less distress to the child. This should be done in compliance with the clinical holding guideline (OLCHC 2009).

6.4 Measuring and inserting a Nasogastric Tube

Action:	Rationale & Reference:
Decontaminate hands	Infection Control Department 2013
To measure the length of tube to be inserted: Place the tip of the tube at the tip of the child's nose and extend the tube to bottom of the child's earlobe. From there, extend downward to midway between the xiphoid process and the umbilicus.	This measurement is the approximate length of tubing needed to reach the stomach. (Bunford, 2010) All other methods of measuring the length of the tube to be inserted are frequently found to be either too short or go beyond the body of the stomach (Beckstrand, Ellet & McDaniel 2007, NPSA 2011).
Mark the place on the tube with pen or tape or take note of the number on the length of the tube	To record the length needed (Bunford, 2010, NPSA 2011)
Lubricate the tube tip of the NG tube by placing the tip of the NG tube in sterile water Do not use KY jelly.	Lubrication facilitates the passage of the tube through the nasopharynx (Bunford 2010) KY jelly may affect Ph (Clynes & O'Connor 2010).
Stabilise the infant/child's head: Infant, side lying position: place the palm of the non dominant hand along the side of the infant's face. Avoid hyper extending the neck. OR Infant, supine position: encircle mandible with an extended thumb and forefinger.	There is less risk of aspiration in a side lying position (Clynes & O'Connor 2010). Hyper extension of an infant's neck can occlude the airway. (Clynes & O'Connor 2010).

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	


	
<p>Child: Ask the child to :</p> <ul style="list-style-type: none"> • sit in an upright position • extend their neck, • keep their head still, • Breathe through the mouth and to swallow when instructed. Encourage child to have a sip of water (Bunford 2010). 	<p>Extending the neck relaxes the child and provides a better angle for tube insertion Giving the child a role to play in the procedure elicits cooperation (Ball et al 2012).</p>
<p>Ensure the cap at the end of the tube is closed.</p> <p>Insert the tube into the selected nostril ensuring that the curved end of the tube is facing downward. Angle it slightly upwards and gently advance it along the base of the nose into the pharynx.</p> <p>Continue to pass the tube until the marked point is at the opening of the nostril. The tip should now be in the stomach</p>	<p>Prevents leakage of stomach contents (Clynes & O'Connor 2010).</p> <p>Following the curves of the nasal passage facilitates tube insertion and decreases trauma (Bunford 2010). (Clynes and O'Connor 2010).</p>
<p>Infants:</p> <ul style="list-style-type: none"> • Encourage swallowing with use of a soother. • In synchrony with the child's swallow reflex continue to advance the tube to the pre measured length. 	<p>Swallowing eases the passage of the tube and reduces risk of insertion into trachea (Howe et al 2010)</p>
<p>Check the child/infant's mouth and oropharynx to ensure the NG tube is not coiled in the child / infant's throat.</p>	<p>To help ensure correct positioning</p>
<p>Observe for signs of vagal stimulation while passing the tube past the gag reflex area. These include</p> <ul style="list-style-type: none"> • decreased pulse 	<p>Vagal stimulation can cause cardiac depression, bronchial constriction, coughing, gagging and vomiting. (Smith et al. 1991)</p>

Our Lady's Children's Hospital, Crumlin		 <p>Ospidéal Mhúire na Leanaí, Croughlinn</p> <p>Our Lady's Children's Hospital, Crumlin</p>
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

<ul style="list-style-type: none"> • gasping • coughing • cyanosis • apnoea • gagging • vomiting <p>If any of the above symptoms occur, remove the tube and wait for the child's/infant's condition to stabilise before proceeding. (Clynes & O'Connor 2010).</p>	<p>GOSH (2012) state that if gagging occurs ask the child to take a sip of water and swallow to aid the passage of the NG tube over the glottis.</p> <p>If gagging occurs in infant encourage infant to suck on soother.</p> <p>Swallowing helps ease discomfort and closes the epiglottis and facilitates passage of the tube into the oesophagus (Bunford 2010).</p>
<p>Observe for signs that NG tube placement is in the trachea or bronchus:</p> <ul style="list-style-type: none"> • excessive coughing • choking • cyanosis <p>If this occurs withdraw the NG tube and reinsert after the child/infant has recovered and symptoms have ceased.</p>	<p>Presence of the tube in the trachea or bronchus occludes the airway and is potentially hazardous. (Clynes & O'Connor 2010).</p>
<p>Ask the person assisting to hold the tube in place or tape the tube temporarily in place while you verify correct placement.</p>	<p>To keep it secure when the nurse is getting the tape to prevent slippage. (Bunford 2010).</p> <p>Correct and safe functioning of the tube requires correct placement (Glasper et al 2010).(see appendix 1)</p>

6.5 Clarifying tube placement

Action:	Rationale & Reference:
<p>Aspirate 1 ml of stomach fluids into a 10/20ml syringe if PVC tube or 50/60ml if PU syringe, by applying gentle negative pressure.</p>	<p>Aspiration of stomach contents indicates the presence of the tube in the stomach (Clynes & O'Connor 2010, NPSA 2011).</p>
<p>Test aspiration fluid with pH paper (Clarke & Richardson 2007, NPSA 2011). Match colour change of the strip with colour code reference on the box to identify the pH of the stomach contents</p> <p>Note: Absence of fluid is not necessarily evidence of incorrect placement. The stomach may be empty, or the tube may not be in contact with stomach contents. (Clynes & O'Connor 2010).</p> <p>Note: DO NOT INJECT AIR INTO THE NG TUBE TO DETERMINE POSITION</p> <p>If in doubt about correct placement of NG tube - DO NOT COMMENCE FEED.</p>	<p>A pH reading of 0-5.5 indicates contact with stomach contents and this verifies that the tube is in the stomach (Bunford 2010). Note: An infant/child on gastric acid blocking medications e.g. ranitidine, omeprazole may have a gastric pH of >5.5.</p> <p>Testing placement by injecting air into the tube and listening with a stethoscope can be misleading because a bolus of air can be auscultated over the stomach when the tube is still in the oesophagus. Also the sounds heard are similar to those heard when air is instilled into the lungs via a nasogastric tube. (NPSA 2005, 2011, Clynes & O'Connor 2010).</p>

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

<p>If unable to aspirate stomach contents:</p> <ul style="list-style-type: none"> Place the infant/child on the left side to pool gastric secretions and aspirate again. If still unable to aspirate stomach contents, slightly advance the tube (approximately 1 cm) and re attempt aspiration. The child/infant may be offered a drink if appropriate to their fasting status / oral restrictions and re attempt aspiration after 5 minutes. If this is unsuccessful, contact medical team for further management. An x-ray should be obtained if any questions arise concerning the placement. (ASPEN 2009) If a pH reading is >5.5, review patient's medications. 	
<p>Once correct placement is determined secure the tube to the infant/child's cheek with adhesive tape. Adhesive tape should be wide enough to cover the NG tube with overlap at each side, allowing 3cms of tube to be secured.</p> <p>A skin protector or hydrocolloid dressing may be applied to the infant/child's cheek prior to securing the tube. Adhesive tape should not extend beyond the boundary of the skin protector.</p>	<p>A secure taped tube decreases the risk of tube displacement and aspiration and allows for freedom of head movement (Bunford 2010)</p> <p>To prevent skin reaction & damage (Bunford 2010).</p>
<p>If the feed is not to be commenced immediately, gently flush the tube with 2-5mls of sterile water once correct placement is determined (volume and fluid restriction appropriate).</p>	<p>To ensure patency of the tube (Bunford 2010).</p>
<p>For a polyurethane feeding tube the internal lubricant of the tube must be activated immediately before the stylet is removed. Flush the tube through the stylet connector with 10mls of water and remove stylet, flush only after position of tube has been clarified (see table 1).</p>	<p>The wire is intended for insertion only as it occludes the tube's lumen.</p>
<p>Dispose of all equipment appropriately.</p> <p>Decontaminate hands</p>	<p>To promote safety and prevent cross contamination. (OLCHC 2010)</p> <p>To prevent cross infection (SARI HSE 2009, Infection Control Department 2013, OLCHC 2013)</p>
<p>Document insertion depth of tube and side it is inserted</p>	<p>To maintain accountability through accurate recording of clinical practice (An Bord Altranais 2002)</p>
<p>Note – where possible children who require long term nasogastric tubes should be encouraged to pass their own NG tubes (if age- appropriate).</p>	<p>To promote independence in managing their own care therefore encouraging compliance with feeding regime (Holden et al 1997, Johnson 2007).</p>

NOTE: Orogastric Tubes.

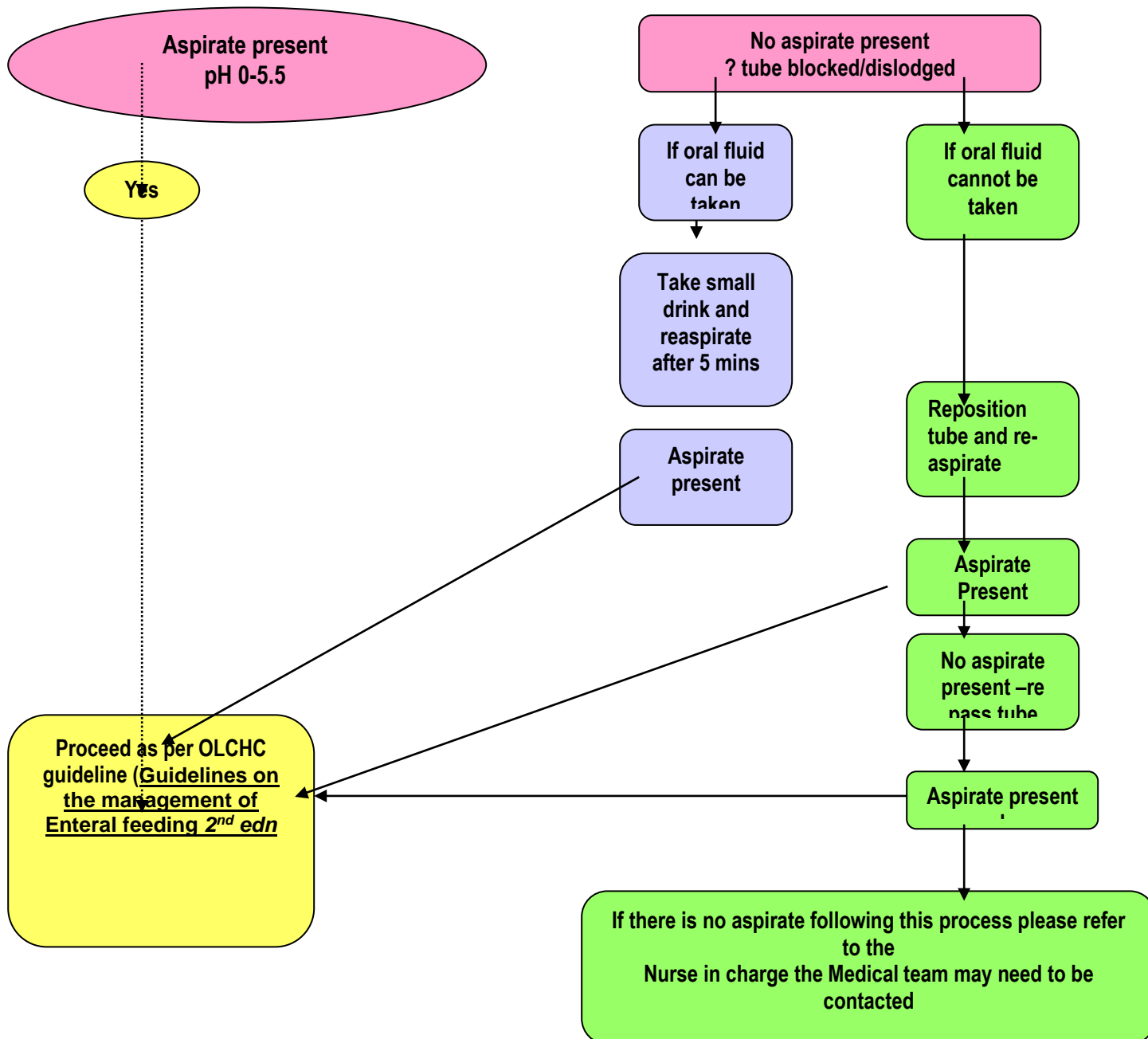
The technique and precautions taken with an orogastric tube are the same as those for NG tube insertion and management. Care should be taken not to damage lips or gums which can occur if the orogastric tube is secured too tightly (GOSH 2012).


NOTE: Please refer to Appendix 2 for the management of NG tube insertion into a patient with Epidermolysis Bullosa.

Table 2

Algorithm for Checking Tube Placement


The following steps should be taken to check the placement of a nasogastric tube prior to the commencement of feeding. Aspirate the tube using the appropriate size syringe and check the PH of the aspirate using the appropriate PH paper. If at any stage you are unsure of the NG tube position –**Do Not Commence Feed**- contact the nurse in charge who will request a medical review




Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

6.6 Setting up and administering a nasogastric feed

Action	Rationale & Reference
Refer to Part 1, points 2, 3 and 7. Infant: change nappy ensuring universal precautions are maintained.	The baby will be more comfortable.
Prior to commencing the feed: Ensure that it is the correct amount and type that it has been stored correctly and is in date.	To prevent error and adhere to hospital guidelines
Hang times: If applicable prime the feeding container and tubing. Add no more than 4 hours volume of feed. Milk Formula should be exposed to room temperature for no longer than 4 hrs, after which time it should be discarded (ASPEN, 2009). Note: If formula has been heated this time frame is reduced to one hour in the clinical setting	(See Dietician Guidelines in appendix 1 for hang times of feeds). Milk Formula at room temperature is subject to bacterial growth. (Bunford 2010)
In order to verify correct placement of nasogastric tube:-Refer to Part 6.5	
If requested by medical team, check for residual volume from previous feeds before each intermittent feed. Document and record the amount and character of the fluid. If volume is large prior to bolus/intermittent feeding contact team and follow their instructions - feeding volume may need to be reduced. If there is more than one half of the previous feed remaining, refer to medical staff prior to giving feed.	To maintain accountability through accurate recording of clinical practice (An Bord Altranais 2002)
Prior to the feed position the child by: Requesting that he/she sit normally in a chair. Alternatively elevate the head of the bed. Or Infant by: Placing the infant at a 30 degree angle Or. Holding the infant in the crook of the arm with head and chest elevated.	Correct positioning enhances patient's comfort and safety. Elevating the patient's head and chest enhances the gravitational flow of feeding. It can minimise risk of regurgitation and aspiration (Brown 2011).
Any medication that is due should be administered prior to feeds. Flush the tube with 5 - 10mls of sterile water after instilling the medication using the second syringe. (If an infant is on restricted fluids the volume of flushes must be included in total fluid intake). Refer to feeding chart and dietician prescription sheet prior to commencing feeds.	To provide clustered care and ensure minimal disruption to the child/infant. To ensure medication is administered as prescribed at the correct time. (An Bord Altranais 2007)
A label should be affixed to all feed formula administration containers. The label should contain the: <ul style="list-style-type: none"> • name of the nurse responsible for hanging and preparing the feed • type of feed. • date and time the feed was prepared and hung. 	To promote safety and prevent potential confusion if the child is transferred to a different unit or a new staff member takes over the care. (OLCHC 2010) (ASPEN 2009)
ADMINISTERING THE FEED Intermittent bolus feeding:	Pinching off the tube prevents excess air from entering the stomach via the tube (Bunford, 2010).

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

<p>A) Open Feed system: Clamp or pinch off the proximal end of the tube and attach the barrel of the 20 ml / 60 ml syringe to the tube. Warm feed in bottle warmer if preferred by infant/child Pour the feed into the barrel of the syringe.</p> <p>Unclamp the tube and let the feed flow in slowly with gravity. Hold the barrel of the syringe approximately 15cms above stomach level. Refill the syringe before it empties. A new giving set must be used with each feed for open feed systems.</p> <p>Note: If child is on intermittent gravity feeds or NG is left on reservoir, change syringe with each feed.</p> <p>Note: If a thickening agent is to be added to feeds, the use of a pump may need to be considered as the diameter of the NG tube may be too narrow to allow flow of feed. (Trigg & Mohammed 2010)</p> <p>B) Closed Feed System: A closed pack can be used for 24 hours. Aseptic technique must be used when setting up these feeds. (Refer to Appendix 1 for management of same).</p>	<p>The greater the height of the syringe the faster the flow rate. Rapid feeding may cause Dumping Syndrome (Skale 1992, Jacobs 2010, Irving et al 2014).</p> <p>(See Dietician Guidelines in appendix 1 for hang times of feeds). Milk Formula at room temperature is subject to bacterial growth. (Bunford 2010)</p>
<p>Continuous feeds: Hang the prepared container with attached clamped tubing. Set the feeding pump to the prescribed rate. Attach the primed tubing to the feeding tube, unclamp the tubing and set the pump to the desired rate and press start. There should be 4 hours worth of feed in the container. After 4 hours the container and tubing should be changed and a fresh feed commenced. Check ph of the NG tube 4 hourly and as per patient's condition.</p>	<p>To prevent bacterial contamination (ASPEN 2009).</p> <p>Use clinical nursing observations and medical advice to determine need for more frequent checks.</p>
<p>As the last of the feed empties from the neck of the syringe or container, pour in a water flush 3mls - 30mls, depending on the child's clinical condition and following any instructions from the dietician.</p>	<p>Flushing the tube rinses feed from the tubing and prevents blockage. (Bunford 2010)</p>
<p>Talk to the infant or child during feeds. Cuddle infant and allow them to suck on a soother during feeds. Introduce non-nutritive sucking with a gloved finger or a soother as appropriate. Refer to speech and language oral stimulation programme specific to the infant/ child.</p>	<p>Talking can help the child / infant associate feeding times with something pleasant and become accustomed to the social nature of feeding.</p> <p>Sucking a soother allows the infant to associate the oral experience of sucking with the sensation of satiation. (Bunford 2010).To improve the sucking reflex (Pinelli & Synington 2010)</p>
<p>Pinch or clamp the tube before removing syringe or tubing, cap the tube.</p>	<p>Prevents reflux of feed. (Skale, 1992)</p>
<p>Tie up the NG tube using tape or an elastic band.</p>	<p>Ensure the tube is secure so as an infant cannot</p>

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

	pull at the NG tube and potentially dislodge it.
If the tube is to be vented place the empty syringe barrel above stomach level.	Allows decompression of air from into the syringe thereby preventing vomiting (Howe et al 2010).
Burp or wind the infant after feeding.	To expel air from the stomach.
When feed is completed place infant lying on his/her back in the cot, unless otherwise indicated by their medical condition e.g. Gastroesophageal reflux (in these circumstances the head of the cot may need to be elevated)	Correct positioning of the infant is necessary to reduce the risk of Sudden Infant Death Syndrome. (ISIDA & HSE, 2012).
Document date, time, type and volume of feed given. Record any vomits / regurgitations, using the twenty four hour clock. Include the amount and character of any residue present.	To record fluid balance, to ensure adequate hydration / nutrition. To maintain accountability through accurate recording of clinical practice (An Bord Altranais 2002)

6.7 Removing a nasogastric tube


The decision to remove an NG tube will be made in collaboration with nursing staff, dietician and medical team.

Action	Rationale & Reference
Explain procedure and need for removal to child/parents/carers	Explanations can gain co-operation and trust and allay fears (Ball et al 2012).
Gather equipment for removal: adhesive remover, gloves, kidney dish.	To prepare environment (Trigg & Mohammed 2010)
Gently use adhesive remover to remove the hypo-allergenic tape and skin protector.	Using adhesive remover will reduce trauma of removal of tapes from skin.(Mather & Denyer 2008, Denyer 2011)
<p>Child: Encourage the child to take a deep breath and as he/she exhales, gently and swiftly remove the NG tube from the child/infant's nose.</p> <p>Infant: Observe the infant's breathing and remove the tube, as above, as the infant exhales.</p>	To ensure the NG tube is removed swiftly and with as little distress as possible to the patient (Glasper et al 2010)
Dispose of NG tube in appropriate waste disposal bin.	Prevention of cross infection SARI (HSE 2009) OLCHC (2010)
Comfort child/infant and tend to oral and nasal hygiene.	To remove debris and organisms from around the nose and mouth and to promote comfort for the child. Prevention of cross infection SARI (HSE 2009) OLCHC (2010)

7.0 Special Considerations

8.0 Companion Documents

OLCHC (2013) Aseptic Non-Touch Technique Reference Guide

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	


9.0 Implementation Plan

Communication and Dissemination


- Guidelines will be posted on hospital Intranet
- Hard copies of the guidelines will be placed in the Nurse Practice Guideline Folder in each clinical area
- Email will be circulated to all staff informing them of issue of guideline
- Information will be circulated in NPDU Newsletter

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Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

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Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

10.0 Bibliography

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11.0 Appendices


APPENDIX 1

Department of Clinical Nutrition and Dietetics Tel: 01 4096809 Fax: (01) 4096146 E-mail: dietetic.secretaries@olchc.ie

7.0 SUMMARY: GUIDELINES ON THE HANG TIME OF ENTERAL FEEDS & PLASTICS FOR

INPATIENTS Feeds should always be handled using a non touch aseptic technique. (give ANTT)Always check the label and date on bottle before using.

System	Max Hang Time of Giving Set Pack/ Reservoir	Max Hang Time of Feed	Comment
Sterile Pre Filled Pack Feeds or Closed Systems (e.g. Infatrini™, Nutrini™ and Nutrison™ range of feeds)	24hours	24hours	<u>Pack feeds and Closed Systems Pack feeds</u> may be hung for a maximum period of 24 hours if child is being fed continuously (ASPEN 2009). For Bolus Feeds using the pack system. • Always use the Infinity Pack giving set with the drip chamber (i.e. not the mobile giving set). The drip chamber prevents retrograde contamination of the feed from the feeding tube (ASPEN 2009). This is the giving set used In OLCHC. • Always leave the giving set connected to the pack between bolus feeds. • Packs can be left hanging between feeds (i.e. there is no need to keep the pack and giving set refrigerated between feeds as there is no evidence to support this). • Use a new giving set every time the pack is changed. • Try to minimize the number of disconnections • When disconnecting the giving set from the feeding tube (i.e. NG/PEG) use aseptic techniques. • Replace clear cap on the purple end of the giving set between feeds. Do not discard purple tip or clear cap when setting up feeds • To be conservative, before reconnecting the giving set to the NG/PEG tube for the next bolus feed, press the “fill set” button on the Infinity pump to flush out the 10-15mls of feed in the tube and refill with new feed from the pack. This will flush out any contamination in the distal end of the giving set (Moffitt et al. '97).

Our Lady's Children's Hospital, Crumlin		
Document Name: Guidelines on the Management of Enteral feeding: Nasogastric Tube Placement & Nasogastric Feeding		
Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

Powdered infant Formulae and other Reconstituted Powdered Feeds	4 hours	4 hours	These feeds are non sterile .
Ready to feed infant Formula (e.g. SMA HE / Infatrini)	4 hours	4 hours	When these feeds are decanted their sterility is decreased and therefore they become non-sterile.
Expressed Breast Milk (EBM) (Fresh or defrosted)	4 hours	4 hours	Always check the name on the EBM bottle and dates on label before using. Use second checker
Bolus Syringe Feeds that remain on Reservoir	Change with each feed.	Gravity Infusion	Change with every feed irrespective of feed type.
Feeds infused via jejunal route (nasojejunal, jejunostomy or gastrojejunal).	4 hours	4 hours	When a patient is fed directly into the small intestine there is a greater risk of developing infection as the defence mechanism of the acidic stomach has been bypassed (Courtney-Moore, 1985).

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APPENDIX 2

Special Considerations for Children with Epidermolysis Bullosa (EB):

Despite great care, NG tubes can cause internal and external trauma and they should not be placed routinely in a child with EB.

Due to the sensitive nature of the mucosa and skin of children with EB, the following special considerations should be taken into account:

Action:	Rationale:
<p>Whatever the age of the patient, the tube used should be as soft and of as narrow a gauge as possible.</p> <p>Use a small size NG tube – A size 5FR is the smallest available and is the tube of choice.</p>	<p>This tube will minimise the risk of damage to the oral and oesophageal mucosa as it is the softest tube available (Hayes 2010).</p>

Our Lady's Children's Hospital, Crumlin		
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Reference Number: GMEFNTPNF-CBS-09-15-V2	Version Number: 3	
Date of Issue: 10 th September 2015	Page No: 1	

<p>NG tubes are difficult to secure, and only non adhesive dressings or silicone tape that are recommended for fragile skin should be used.</p> <p>Secure the NG tube in place by firstly placing a protective dressing on the skin e.g. Mepitel ® and securing tube with a soft silicone tape e.g. Mepitac ®</p>	<p>Prevents damage to the skin as it provides a non-adhesive method of securing the tube. (Haynes 2010, Trigg & Mohammed 2010).</p> <p>These wound dressings are recommended as they do not adhere to the skin. They are 'sticky' to the touch but are easily removed from the wound without pain or trauma (Denyer 2010, Lara- Corrales <i>et al</i> 2010).</p>
<p>For removal of nasogastric tube, use silicone medical adhesive removers</p>	<p>To safely remove adhesive products. (Denyer 2011)</p>

Consider contacting the CNS in EB for advice if necessary.

NOTE: This may be used for children with various skin conditions.

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