GUIDELINES AND AUDIT
IMPLEMENTATION NETWORK

Guidelines for caring for an infant, child, or young person who requires enteral feeding

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Preface

There are a large number of children and young people in settings such as hospitals, homes, schools and respite facilities, who require various enteral feeding regimes to achieve effective nutrition. Enteral feeding can have a big impact on family life resulting in both psychological and practical problems which should be addressed regularly. Multi professional teams provide support to ensure the safe and effective management of all aspects involved with enteral feeding. It is therefore essential that all staff, families and carers have the necessary knowledge and skills to provide safe, effective, person centred care.

GAIN has identified the need to develop guidelines. The objective is to ensure that a consistent approach is provided for the management of enteral devices in children and young people across all Health and Social Care Trusts in the province. This document contains guidelines covering the types, indications for use and potential risks of enteral feeding devices used in children across hospital and community settings. It also aims to enhance the communication processes between the hospital and community to ensure a seamless pathway. Service users also identified the need for supporting booklets and these have been developed for parents and carers providing a summary of the essential information that they require. Although the guidance relates to the management of enteral devices, it is important to acknowledge that there is work on-going regionally, regarding the procurement of disposables and equipment used. When completed this will enhance the usage of these guidelines and provide uniformity for families and staff.

In preparing for this guideline, we have conducted literature searches, and reviewed the most up-to-date guidelines published by professional bodies. We also consulted external experts in the field for peer reviews.

I believe that this guideline will improve patient care and will provide a person centred approach. I would strongly recommend that practices are audited within each Trust area. Any learning should be shared regionally

Finally, I am grateful to all the members of the working group and external experts who have taken time out from their busy schedules to review the guidelines. I also want to thank the GAIN team for their help in producing these guidelines.

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Aims of Guidelines

The aims of this clinical guideline are to:

- Ensure that all practices associated with the commencement, care, management and replacement of enteral feeding devices in infants, children and young people are based on the best current evidence.

- Standardise practice both for the management of enteral feeding and replacement of enteral feeding devices across all Health and Social Care Trusts to ensure a consistent approach for staff and families.

- Provide a standardised approach to training for all staff and parents whose infants/children/young people require enteral feeding.

- Improve communication and documentation processes between hospital and community for infant/children/young people that require enteral feeding.

Note:

This guideline excludes neonates/ pre-term babies because their physiology is different to that of an older baby. As a result, staff caring for such babies within neonatal units should adhere to national, regional and local guidance.

Please note that throughout these guidelines the terminology 'child' will cover infant, child and young person.

Enteral Feeding

Enteral nutrition is the provision of safe and effective nutritional support through the use of an enteral feeding device. It is generally required when a child is unable to meet their nutritional and/or hydration needs orally. The enteral device may also be used for aspiration purposes, venting and/or administration of medications. Enteral devices are situated in the gastrointestinal tract –stomach/jejunum/duodenum.

Enteral feeding aims to:

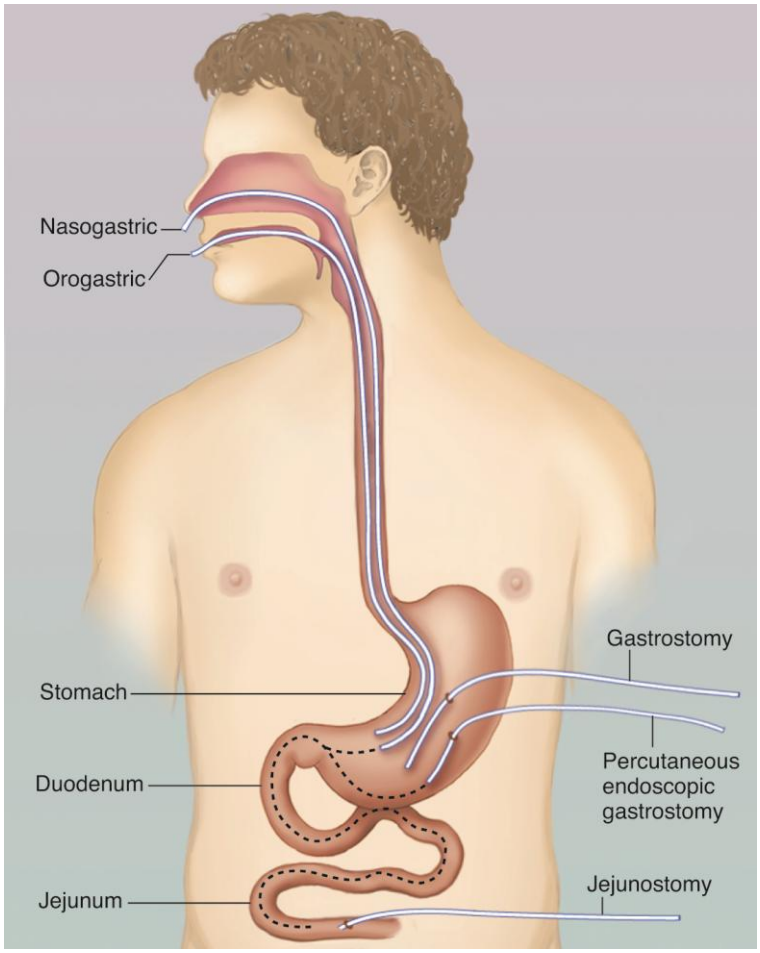
- Provide effective nutrition support.
- Empower the child and/or family to participate in nutritional care decisions.
- Enable provision of feeding in all hospital and community settings taking into account the unique needs of each child.[1]

Enteral Feeding Devices

The table below indicates the different routes and types of enteral devices currently being used with children. Also included are indications for use and potential risks.

Type of Enteral Feeding Device	Placement and Use	Indications	Potential Risks
Orogastric Tube	A feeding tube passed through the mouth directly into the stomach Bolus/continuous feeds	More commonly used in neonates Inability to maintain adequate oral intake of nutrition / medicines/fluids Fractured base of skull	Difficulty in obtaining aspirate to check position Aspirate may have a pH reading above 5.5 due to medications Accidental dislodgement Tube migration or misplacement into oesophagus/lung Trauma to mucosa Blockage
Nasogastric Tube **2 types:** Short Term use Long term use	A narrow tube that is passed into the nose and down the oesophagus into the stomach which allows liquid feed/medication to be delivered directly into stomach. Bolus/continuous feeds	Inability to maintain adequate oral intake of nutrition / medicines/fluids	
Gastrostomy devices Percutaneous Endoscopic Gastrostomy tube(PEG)	Feeding devices which allow liquid feed, fluids and/ or medicines to be delivered directly into the stomach Suitable for Bolus/continuous feeds Venting and/or aspiration purposes	Long-term Inability to maintain oral intake	Accidental dislodgement Tube migration Granulation at stoma site Infection

Type of Enteral Feeding Device	Placement and Use	Indications	Potential Risks
Button / Low profile device Non-balloon gastrostomy tube Balloon gastrostomy tube(also called a replacement gastrostomy or G tube)	An initial gastrostomy tube can be inserted endoscopically, radiologically, surgically or percutaneously in a surgical theatre environment		Buried bumper(internal plate has become buried in stomach wall) Blockage
Nasoduodenal tube **Nasojejunal tube**	A polyurethane tube which is inserted via nose through the stomach and into either the duodenum or jejunum Position confirmed radiologically **Continuous** feeds only	Inability to maintain adequate oral intake of nutrition / medicines/fluids Delayed gastric emptying Gastro-oesophageal reflux resulting in risk of aspiration Intractable vomiting Delayed gastric emptying Motility disorder Anatomical anomaly	Trauma to entry site Infection Tube misplacement/ Migration Accidental dislodgement of tube Small bowel intussusception Tube blockage Electrolyte imbalance with large gastric losses
Transgastricjejunal tube (gastrojejunostomy)	Long term use Balloon type devices placed endoscopically or radiologically via an established gastric stoma **Continuous** feeds only		
Jejunostomy Balloon button device Tube device G tube with external fixator	Long term use Enteral feeding device inserted surgically into jejunum **Continuous** feeds only		



LOCATIONS OF VARIOUS TYPES OF ENTERAL FEEDING TUBES

Nasoduodenal, nasojejunal, and percutaneous endoscopic jejunostomy tubes extend(dotted line) to the small intestine instead of ending in the stomach.

Illustration by © Taina Litwak 2008

Enteral Device Essentials

In the interest of patient safety and professional liability, manufacturers' recommendations and multi professional codes of practice such as the NMC code[2]for nursing and the HCPC for Dieticians must be followed. Everyone involved in enteral feeding should receive initial training to obtain competencies and on-going training to maintain competencies.[3]Records should document competencies achieved based on regional guidelines.
The risk of complications developing can be reduced by adhering to guidance provided regarding management of the enteral device and stoma site, and being able to observe and recognise any arising complications.[4]

Before accessing an enteral feeding device it is essential the following is known:

- Reason(s) for the enteral device e.g. feeding, medicines, aspiration, venting.[5]
- When, where and how was the enteral device inserted
- How the device is secured e.g. anchoring sutures
- The type/size of enteral device used and how it is retained?
- Where the tip of the enteral device is situated – stomach/small intestine

This information should be included in the individualised care plan for the child within the hospital/community setting (Appendix 1).

Discharging a child from hospital to home following insertion of an enteral feeding device

- Parents/ carers should be enabled to be involved in the management of the child's enteral feeding device as soon as possible following insertion. Where possible, the child should be empowered by staff and family, to contribute to the management of their enteral feeding.
- The Child's Community Nursing Team should be contacted as soon as the child has been identified as requiring enteral feeding support within the community.

- If a child is discharged within 72 hours of gastrostomy insertion- a 'red flag' alert advice label is to be included in child's hospital notes and discharge information and, parents/ carers should be instructed to **STOP** feeding and seek urgent medical advice immediately if the child experiences the following:

    - Pain on feeding
    - Prolonged or severe pain post-procedure
    - Fresh bleeding
    - External leakage of gastric contents[6] (Appendix 2)

  The discharge checklist should be completed before the child's discharge and copied to the CCN Team (Appendix 1).
- The CCN Service should contact the family following discharge and arrange a home visit.[7]

Competency Based Training

- Before discharge, parents/ carers should be trained and deemed competent in all aspects of their child's enteral feeding device and feeding regimen. A record of competencies must be forwarded to the relevant Community Team. An update of this training should be offered annually within the community setting and at any stage when there has been a change in the child's enteral device and/or feeding regimen.

- The training delivered to parents/ carers should be provided by a registered professional who is competent in all aspects of enteral tube feeding.

- The training of parents/ carers should include:
    - Minimising the control and risk of infection e.g. hand washing, cleaning of equipment and food safety awareness.
    - Type, make and size of the enteral device.
    - Feeding Pump if required
    - General management of the enteral device including:
        - Checking position.
        - Flushing.
        - Administration of feeds/fluids / medicines.
        - On-going care of stoma site.
        - Trouble shooting guidance, including the accidental dislodgement of device.[8 9 1]

Infection Prevention and Control in Enteral Feeding [10 11 12 13 14]

- There are associated infection risks with enteral feeding due to potential contamination during feeding preparation and administration.

- Aseptic Non-Touch Technique (ANTT) principles should be applied when preparing feeds and throughout the duration of enteral feeding.

- Effective hand decontamination by the person preparing and administering the enteral feed should be adhered to. (Appendix 3)

- Personal protective equipment such as gloves and aprons should be used by Healthcare workers.

- In order to minimise infection, all aspects of care relating to enteral feeding must be taught to parents/carers before the child is discharged from hospital.

- Instructions regarding cleaning of reusable syringes, extension sets and feeding pump are to be discussed and provided to family.

- All disposable items should be bagged and placed in the household bin. Enteral syringes cannot be put into the household recycling bin.

Post-Insertion of enteral device

Enteral device inserted via oral/nasal passage	Rationale
Ensure device is securely taped in position and always replace tape if it appears to be loose.[15]	To avoid displacement.
Use a soft hypoallergenic dressing on face for securing device and check facial skin daily for any reactions to tape/pressure.	To detect any tape allergy and skin breakdown.
Avoid unnecessary pressure to nasal/oral passage when applying securing tape.[16]	Nasal/oral devices should be able to move freely when swallowing to avoid pressure necrosis.
Use alternate nostrils on tube replacement where possible and document	To avoid trauma to one nasal passage.
Naso gastric tube must only be only replaced by a competent trained person and position confirmed before use. Some Naso gastric tubes can be washed and reused as per manufacturer's guidance.	
Nasojejunal/duodenal tube must only be replaced in hospital.	Confirmation of placement must be determined radiologically
Gastrostomy/jejunal devices	**Rationale**
<u>Initial post-operative care</u> Monitor child's vital signs and pain score, early warning score ½ hourly for 4 hours, then hourly for 4 hours and then 4 hourly if vital signs remain within normal limits.	To detect any postoperative complications.
Observe dressing on wound site for leakage of gastric contents or bleeding ½ hourly for 4 hours, then hourly	

for 4 hours and then 4 hourly if no concerns are noted. Give regular analgesia as prescribed noting effect. Administration of feed should commence as per Surgeons and Dietetic recommendations – every child is individually assessed.[10] **STOP FEED/ MEDICATION DELIVERY IMMEDIATELY IF THERE IS:** • **PAIN ON FEEDING** • **SIGNS OF DISTRESS/ PHYSIOLOGICAL INSTABILITY** • **PROLONGED OR SEVERE PAIN POST–PROCEDURE** • **FRESH BLEEDING** • **EXTERNAL LEAKAGE OF GASTRIC CONTENTs** • **SEEK MEDICAL ADVICE** **If child is discharged within 72 hours post insertion of device this information is to be highlighted to parents, GP and community staff and child's notes clearly labelled (Appendix2).**[6]	 Ensure pain is effectively managed Possible complications include chemical peritonitis, infection, bowel perforation, and haemorrhage and aspiration pneumonia. Prompt recognition and early action reduces the risk of further complications.
<u>Care of stoma site</u> During the initial 24 hours the enteral device site should be covered with a non-occlusive sterile dressing. This should be placed under fixation plate if used. Extension plate should be placed to avoid pressure at stoma site. Record the number visible at the fixation plate in the child's notes. On Day 1 dressings should be removed post-operatively and site left exposed unless exudate is present. Clean daily using Aseptic Non Touch Technique with sterile water until stoma site has healed which can take at least two weeks. Gently dry thoroughly.	 To reduce risk of infection, maintain healthy stoma and prevent skin breakdown.[4] Extension device should retain the tube but not exert any tension on the stoma canal.[17] Indication if tube has migrated. To remove debris from stoma site and device which may be a medium for bacterial growth.[5]

Use gauze that does not shed fibres when cleaning stoma site. Always ensure the stoma site is thoroughly dried. Do not apply any creams or talcum powder.	Loose fibres can become entangled in gastrostomy device causing trauma to the child and device.[4]
The child may have a shower following discharge from hospital ensuring the enteral device is not submerged under water. The child may have a bath once the stoma site has healed. Once stoma site is healed the enteral device tubing, tube and surrounding skin should be cleaned and dried daily with non-perfumed hypoallergenic soap and fresh tap water.	To minimise moisture in which infection/skin damage can develop.
Discuss with Health Professional if child is able to go a swimming pool - stoma site must be healed	Chlorine may aggravate stoma site
Clean stoma site as previously advised following the swimming pool	To prevent cross infection and promote discretion
Always observe stoma site and surrounding skin for signs of inflammation, swelling, exudate and discomfort. If there are any concerns contact Community Team.	Indication of infection
<u>Management of external fixation plate</u> Do not move external fixation device until instructed to do so and training provided. Fixation plate is then adjusted on a weekly basis	To allow traction to assist in the stoma formation.
Avoid taping tube to abdomen	To promote straight tract formation.
When the stoma tract is established – the position of the external fixation plate can be marked with an indelible marker – as the child gains weight it may be necessary to renew the indelible marking.	To ensure device remains in the correct position to avoid complications. Markings on the device over time can be difficult to identify therefore it assists child, parents, carers ensure correct positioning.[18]
<u>Rotation of enteral device</u> Initial rotation/advancement of the gastrostomy	To promote stoma tract formation

device is dictated by the Surgeon and each child is individually assessed as to when this will commence. Thereafter the enteral device should be rotated 360 degrees on a daily basis. Contact Community Children's Nurse (CCN) if there are any concerns. **JEJUNAL DEVICES SHOULD NOT BE ROTATED**[5]	To prevent buried bumper. Maintain patency of tract and tube. Prevention of trauma to small intestine and twisting of tubing.
<u>Clamp on enteral device</u> When tube is not in use, the adapter end should be closed and the clamp left open or repositioned daily.	To prevent damage to the tubing.[17]
<u>Balloon enteral devices</u> Check and change the water(sterile water[10] is used) in the balloon once a week.	To ensure device is adequately in place and to maintain function of the enteral device.
Replace the enteral device as per manufacturer's advice and according to training provided. Always check device is in correct place before and after placement by aspirating contents and checking pH value Gastric confirmation should be pH value 5.5 and below; small bowel confirmation should be pH value 6-8.	To ensure functioning of device and ensuring device is in correct position to avoid complications for child.[5]
Measure stoma size annually or sooner if the child has gained or lost excessive weight	To ensure the correct size of device is being used to avoid complications

Disposables required for enteral feeding

A risk assessment should be undertaken for each child taking into account susceptibility to infection and the care setting in order to establish if disposable products required are 'Single Use' or 'Single Patient Use'. [10]

- 'Single use only' - cannot be reused.
- 'Single patient use' i.e. can be reused only on the same child following cleaning. These should be replaced weekly or sooner if required based on Manufacturer's recommendations

- Syringes used for enteral feeding are purple and marked for enteral use.[19l]
- A 20/50ml* purple enteral syringe is recommended where possible because the larger the syringe the less pressure delivered to enteral device which prevents potential damage to internal tubing of enteral device. [20]

- In Hospital, 'single use only' enteral syringes, are only used.
- In community, 'Single patient use' enteral syringes are most generally used, unless the child's risk assessment identifies the need for 'single use only'.

- Disposables required for feeding will vary depending on the Dietitian's regimen for the individual child for e.g. bolus/intermittent/continuous feeding.
  - The enteral feeding system should be compatible with the child's enteral feeding device.
  - Extension sets that are reusable may be required for administration of feed, for e.g. button gastrostomy.

***Reference to 50ml syringe includes 50/60ml syringe**

Enteral Feeds

There are two types of feed:

- Ready to use feeds which have been specially prepared and pre-packed. These are ideally administered with a closed system. In some cases these may have to be decanted. This is agreed with the Dietitian and family.
- Reconstituted feeds are feeds which come in a powdered form and need to be prepared before use.

To minimise the risk of bacterial contamination: [12 22 23 24]

- Initial and on-going/annual training will be provided to family and carers to maintain proficiency and prevent complications. This will include basic food hygiene

principles, for example, hand washing and cleaning of the preparation area and utensils.

- Ready to use feed are the preferred choice in preference to feeds that require decanting, reconstitution or dilution. The most appropriate feed will be prescribed for the child

- All feeds must be used within the marked expiry date.

- Store 'ready to use' feeds in a cool, dry place out of direct sunlight. Avoid storing feeds in gardens sheds/garages and next to radiators.

- 'Ready to use' feeds may be given as a continuous feed, within a closed administration system, up to a maximum of 24 hours once opened.

- Where a feed has been decanted into a feeding administration set, this should be administered within 4 hours and written in the individualised care plan.

- Avoid wastage where possible; once opened, the remaining 'ready to use' feed should be labelled with date and time it was opened, refrigerate and dispose of after 24 hours if not used.

- Reconstituted feeds should be made up with hot water of at least 70 degrees Celsius (to do this, boil the kettle and leave it to cool for no longer than 30 minutes).[21]

- Reconstituted feeds and feeds that have extra ingredients added **should not** be left in feeding administration set for longer than 4 hours – if feeding is required for a longer period, feed can be added freshly every 4 hours.

- Where the child is prescribed continuous feeding – the feeding set must be changed after 24 hours.

- Certain specialised feeds may fall outside this guidance and it is important to check the individualised care plan for specific guidance. Always seek advice from the Dietitian.

Use of liquidised/blended food:

- The administration of liquidised food via an enteral feeding tube is not currently recommended by the British Dietetics Association due to the risk to nutritional inadequacy.[25] [26] Use of liquidised food also increases the likelihood of feeding tube blockage and the risk of gastric infection. It could pose particular risks to infants less than six months, jejunal fed patients or those immuno-compromised.

- The emotional needs and preferences of parents/ carers considering the use of liquidised/ blended food should be taken into account alongside the clinical needs of

the child. However, they need to be made aware of the potential risks to health and the viability of the child's feeding tube. Practitioners should ensure that a full risk assessment is carried out and that they work within their employers' clinical governance guidance and risk management frameworks. Seek Dietetic advice if blended/liquidized food is being considered by the family/child.

Checking position of enteral feeding devices [27 28 29 30]

- A naso-jejunal tube should be checked by recording the marking at the nostril and length of the jejunal tube left outside of the child's body from the nose.

- **ALWAYS** check, confirm and document the position of a nasogastric/naso-jejunal/ naso-duodenal tube following initial insertion, before administering each feed, before giving medications/flush and at least daily when not in use. If there are any difficulties in obtaining aspirate from nasogastric tube refer to NPSA flow chart (Appendix 4) [6 31 32 33 34 35]

- The position of nasogastric/ naso-jejunal/ naso-duodenal tube must be rechecked following episodes of vomiting, retching or coughing spasms or when there is a suggestion of tube displacement. Position should also be checked if there are indications of any new or unexplained respiratory symptoms.

- The position of gastrostomy/ jejunal devices must be checked if there is any evidence of dislodgement of the device. Indications of this include unusual leakage of stomach contents around site, unusual redness or swelling around site, excessive vomiting and/ or abdominal distension or pain.

- Correct gastric tube position is confirmed with a gastric aspirate pH value between 1 and 5.5. **DO NOT USE THE DEVICE if pH value is above 5.5.**

N.B. Children taking antacids, H2 antagonists or proton pump inhibitors are likely to have a stomach pH greater than 5.5 in which case it may be difficult to confirm tube placement with the necessary accuracy. The need to continue this medicine should be reviewed by the prescriber against the need to feed via gastric tube. Additionally individual risk assessments on a case by case basis may be required.

- Correct small bowel position (jejunum/duodenum) is confirmed with pH value 6-8.

- **ALWAYS** check position of all newly inserted devices, and before and after changing a gastrostomy device to ensure the tip of the device is in the correct position.

- Ensure pH strips are CE marked, stored correctly and within expiry date.[31 32 33]

Flushing enteral devices

- Flushes are required (after confirming the correct position of device):
    - Before and after each medication administration.
    - Before and after feeding.
    - Daily if the enteral device not currently in use.[33]
    - During continuous feeds the tube should be flushed every 4-6 hours.[36]

- A pulsatile flushing action ('Push/pause technique') should be practiced when flushing to promote a turbulence effect within the tube. This ensures adequate flushing of device and will help to prevent any blockages of enteral device and promote patency of the tube.[37 38]

- A 20ml/50ml enteral syringe should be used for flushing. It is important to always use the largest size of enteral syringe. This is because the larger the syringe the less pressure delivered to enteral device which avoids potential damage to internal tubing of the enteral device.[20]
    - Sterile water should be used to flush all types of enteral feeding devices in hospital settings[10]
    - Freshly drawn tap water can be used for children who are receiving nasogastric or gastrostomy feeds and are not immuno-compromised.
    - Cooled freshly boiled water or sterile water from a freshly opened container should be used for children who are immunocompromised, this includes children who require jejunal feeding.[10]

- The volume of flush will be advised by the Dietitian and indicated on the child's care plan.[20]

- Volumes of flushes administered should be recorded on child's care plan or fluid chart.

Administration of enteral feeds

- Aseptic Non Touch Technique (ANTT) must be practiced throughout any procedure relating to enteral feeding.

- It is important that the child is established on a feeding regimen which meets their nutritional and dietary requirements.

- The feeding method and prescription is indicated by the Dietitian/ Consultant in consultation with the child and family.

- The correct volume of feed should be prepared at the beginning of the feed.

- Ensure that the child is nursed at, least a 30-40 degree angle; ensuring that their head is above the level of their stomach during feeding to avoid nausea, vomiting and reflux.

- Stop the feed and seek medical attention if there are any signs of shortness of breath, paleness, vomiting or persistent coughing as the child may have aspirated.

- Accurate record keeping should be completed in hospitals/ respite settings and schools. This should include the pH value (for devices that need their position checked before use), date and time of the feed, volume and type of feed being administrated, if the feed was tolerated.

- The enteral feeding device should be flushed on completion of the feed as per the child's care plan.

There are two methods of enteral feeding: [39]

- Bolus feeding which can be given by the gravity method or feeding pump (Intermittent)
- Continuous feeding using a feeding pump

Intermittent and or Bolus feeding:

Intermittent and or Bolus/gravity feeding is the administration of small frequent feeds at regular intervals. It is more physiological than continuous feeds as it stimulates a normal and enzymatic feeding response. This also enables a more 'normal' life for child's family as it allows time lapse between feedings.

Continuous feeding:

Continuous feeds are the administration of a feed at a slower rate over a prolonged period of time. This is indicated when a longer, slower feeding time is more appropriate for the child.

Jejunal/Duodenal feeding:

Jejunal/ duodenal feeding are ALWAYS administered over a longer slower period of time.

The decision to feed continuously overnight must be clearly identified and documented by Dietitian/Consultant and a risk assessment and management plan should be discussed with parents and completed [40 41 42 43]

Risks assessment for continuous overnight enteral feeding

Risk	***Control measure***
Aspiration of feed	*Dietitian/Consultant to identify the need for overnight feeding i.e. severe reflux, vomiting, a condition requiring a slower rate of feeding.*
	Discuss with parents the potential risks with overnight enteral feeding.
Dislodgement of feeding device	*The child should sleep in the same room as the parents*
	Position the child at an angle of 30 degrees or more during enteral feeding.
	Feed thickener/anti reflux medication should be prescribed if child has reflux.
Strangulation/entanglement due to feed tubing	*Child should never be left unattended if awake during the night.*
	The feeding pump should be positioned at the side of the cot/bed with the administration set threaded through the bars rather than dangling over the top of the cot sides.
	The feed tubing should be threaded through the inside of the child's pyjamas.
	Regular review should be carried out for the need of continued overnight feeding.
	Multidisciplinary Team assessment of the family's home needs should be undertaken.

Oral Hygiene

- For children under 2 years mouth care should be recommended.

- Tooth brushing should be performed twice daily.

- If the child is not allowed oral fluids - additional oral hygiene maybe required to keep the mouth moist to prevent gum disease and stimulate saliva and gastric secretions.[32]

- The child should be registered with a Dentist.

Administration of medications via an enteral feeding device [37 44 19]

- Parents/carers/health professionals should be aware of the risks associated with administration of medicines via enteral feeding devices

- Medicines prescribed for administration via the enteral route should be in a suitable formulation e.g. liquids or soluble tablets. If a medicine is not available in a liquid or soluble form, it may be necessary to crush a tablet or open a capsule. Always refer to a Pharmacist for guidance on suitable formulations and suitability of crushing tablets or opening capsules.

- A very limited number of medicines are licensed for administration via enteral feeding devices and most administration of medicines via this route falls outside the product license for that medicine, as does crushing tablets and opening capsules not specifically designed for this purpose. However, this may be the only option for administration of a particular drug.

- If medicines are to be administered via an enteral feeding device and this is outside of the medicines product license, it is important everyone involved in the prescription, supply and administration of the medicine is aware, in the event of any adverse effects resulting from administration via this route.

- A structured medicines review should be carried out on an individual basis for each patient prior to administration of medicines via an enteral feeding device. Any unnecessary medicines should be discontinued and where possible, drug therapy should be kept to a minimum and alternative licensed routes of administration used if appropriate.

- Nurses should always follow NMC (Nursing and Midwifery Council) Code (2010) and NMC Standards for medicines management (2010) in addition to local Trust medicines code and policies.

- General guidance on administration of medicines via enteral feeding devices (Appendix 5).

Risk assessment chart for administration of medicines via an enteral device

Risk	Control measure [44 19]
Medicines may become unlicensed when given via an enteral feeding device. Not all medicines are suitable for administration via an enteral device.	Undertake a structured medicines review Always refer to a Pharmacist to check that the medicine prescribed is appropriate for enteral administration. Ensure that the Pharmacist has all the relevant information i.e. condition of the child, type of enteral feeding device, enteral feed, feeding regime and full medication list. Check with the Pharmacist/prescriber if the drug can be administered by any other method other than enteral device e.g. orally/ topically/ rectally. Prescribers must be informed that the medicine will be used outside the product license.
Drug interactions where more than one drug is prescribed.	Check with the Pharmacist if there are any interactions between drugs prescribed. Check with Dietitian and Pharmacist how much flush needs to be given before, between and after medications. Be aware of fluid restriction and possible fluid overloading
Drug-patient interactions.	Check with a Pharmacist to ensure where the drug is absorbed and where the enteral feeding device is placed has been reviewed as this may have implications on how much of the drug is absorbed e.g. digoxin is absorbed in the stomach so should not be given via a jejunal route. The degree of clinical effect observed may be variable in this instance and the child's condition must be monitored.
Drug-feed interactions	Check with Dietitian and Pharmacist that the drug can be given with enteral feed prescribed e.g. does the feed need to be stopped for any specific length of time before/after drug administration? How much flush needs to be given between feed and medication?
Drug-tube interactions Some medicines e.g. Baclofen, if not administered correctly may bind to the inner lumen of the tube which reduces amount of drug absorbed.	Check with Pharmacist how best to prepare medicine before administration e.g. does the medication need to be diluted to ensure the child receives the correct dose of medication?
Tube blockages may occur due to medications not being	Use a pulsatile flushing action when flushing enteral device as it creates turbulence in the lumen of tube, removing debris and build-

prepared, administrated or flushed appropriately.	up of feed and medication. Ensure flushing with the recommended amount and type of water before/after each medication and feed. Will the drug increase likelihood of blockages e.g. medicines maybe thick in consistency or prepared from granular formulations.
Error in medication administration.	Check that the route of administration is clearly written on the medicine Kardex. Ensure that the person administering the medicine is aware of the function of the enteral device i.e. **DO NOT** administer medicines via enteral devices that are used for aspiration or that are on free drainage. Check type of enteral device. Some enteral feeding devices have two lumens to enable simultaneous gastric aspiration and jejunal feeding. Ensure that the correct dedicated lumen is used for administration of medicines Always check position of the enteral feeding device and do not use if there are concerns. Nasogastric tubes should always have an aspirate of 5.5 or below before flush/ medicines are administered.(see page 17 for further advice) Ensure an enteral syringe is used to measure the amount and dose of medicines. These are purple and marked for enteral use. Use the appropriate size of enteral syringe to accurately measure the dose prescribed. Independently double check any dose calculations to ensure the correct dose is given, for example when calculating the volume of liquid to be given for a particular dose.

Trouble shooting guide for Enteral Devices

Problem		Action	Rationale
1	Dislodgement of stoma enteral Device due to: Accidental dislodgement Tube damaged /perished Balloon type devices – the balloon has deflated or burst	Replace a new enteral device immediately if training has been provided. If not or unable to insert new enteral device – cover stoma with clean gauze and tape and go to hospital immediately. If device is less than 4 weeks from the initial formation of stoma –ensure the position is confirmed in hospital. If device is more than 4 weeks from the initial formation of the stoma: insert new device and check position by aspirating gastric contents to confirm the position. If difficulty is experienced when inserting the new device, stop and cover the stoma site with gauze and tape – Contact the hospital immediately for further advice. If no replacement device is readily available, cover the stoma site with gauze and tape- go to nearest hospital for further management If dislodgement has caused trauma to stoma site– replace the device as trained and the child/young person **MUST** be brought to local hospital to have replacement device position checked. Keep dislodged device for inspection	Stoma opening may close quickly To keep stoma site clean. Stoma tract is newly formed and there is a risk of misplacement of new device into peritoneum. Any newly replaced device must have position confirmed in case of misplacement. To avoid damage to stoma site. If stoma tract is damaged there is a risk of feed leaking into abdomen causing peritonitis.[4 5 6] To ensure the enteral device is complete.
	Dislodgement of gastrojejunostomy device	Go immediately to hospital for replacement – cover stoma site with gauze and tape.	Insertion of new device and confirmation of position is confirmed by Doctor

Problem		Action	Rationale
2	Suspected infection of the stoma site. Possible causes: Contamination of the tube/insertion site (e.g. poor hand hygiene) Child scratching site. Stoma leakage causing damage to surrounding skin Child is immuno-compromised	Identify possible cause and manage appropriately Assess the child's general condition and seek medical advice if indicated. Obtain a swab of exudate from the stoma site for organisms and sensitivity. If an external fixator is present- check its position and adjust if necessary as per training. Continue cleaning the stoma site as per training – the type of dressing will depend on condition of the wound.	To avoid further infections. To identify systemic infection. To ensure effective treatment. To ensure the fixation device is not too loose causing unnecessary movement or too tight causing pressure damage. [17 5 4 6 46]
3	Over-granulation tissue Possible causes: Trauma from friction around the tube Poorly fitting tube. Excess moisture Infection Reaction to foreign body e.g. allergy or hypersensitivity to enteral device	Identify cause and advise parent accordingly, dressing maybe needed to help treat overgranulation Ensure the external fixator is positioned as per training. If a low profile device is used – ensure the device fits correctly in the stoma tract and has minimal movement. If a tube device is being used ensure the tube is looped and taped securely and positioned above the stoma -alternate the position of tube following each feed to prevent granulation – Do Not tape the device until formation of a stoma tract. If overgranulation tissue is exudating – obtain swab for organisms and sensitivity if associated signs of infection Continue on-going stoma site management as per training.	Correct underlying cause of over-granulation Minimize further development of granulation tissue by unnecessary movement of device and tubing. To identify cause of infection and treatment. To prevent further infections and complications.[47] [45 5 48]

Problem		Action	Rationale
4	Leakage at the stoma site after initial 72 hours post operatively Possible causes: Stoma site stretched by the tube being pulled. Occlusion within tube Buried bumper Tube migration due to peristalsis Increased intra-abdominal pressure due to excessive coughing, or straining at stool. Damage to the tube Balloon deflation The rate of feed is delivered too fast Delayed gastric emptying	Identify and manage any underlying cause. Test leakage for pH to determine if it is gastric contents. Use a barrier film around the stoma site If the enteral device has an internal bumper/flange – readjust to ensure its position as per training. Balloon type device – check the water in balloon is the recommended amount. Avoid the device tubing being pulled accidently. Check the position of device Treat any excessive coughing spasms / constipation. Do not clamp the tube when not in use. If there are any signs of tube damage – contact CCN	To prevent any further leakage and further complications. Gastric contents are acidic which can irritate outer abdominal skin. Protect the surrounding skin at stoma site. If internal bumper/flange is too loose leakage may occur. If insufficient amount of water is in the balloon device leakage may occur. Ensure the tip of device is in the correct place. Pressure from this may cause leakage. Tube may weaken if clamped in the same place continually.[45 5]

Problem		Action	Rationale
5	Buried bumper Possible causes: Excessive tension between the inner and outer flange of the device Non-compliance with care plan	Seek advice from CCN Team if there are any signs of: Inability to infuse feeds with pump alarming. Abdominal Pain Peritubular leakage, Leakage around tube Stoma infection. Inability to advance the internal bumper/flange and rotate device 360 degrees.	Early detection of a possible buried bumper can avoid serious complications such as peritonitis.[49 50]
6	Blockage of enteral device Possible causes: Non compliance with care plan Medications Buried bumper.	Identify and manage the cause of blockage. Ensure compliance and technique of enteral device management with regards to flushing the device and medication administration - review if identified. Flush with warm water, using a 50ml syringe with a push/pause technique. NB Do Not use cola, lemon or pineapple juice Massage the tubing between the fingers and thumb to help release the blockage. If unable to release the blockage, consider replacing with a new device as per training. If device is unsuitable for replacement contact the local hospital for further management.	To prevent further blockages occurring. Push/pause technique when flushing causes a turbulence effect which prevents adherence of any contents to inner tube. Acidic juices worsen blockages.[38 37 44 51 36]

Problem		Action	Rationale
7	Nausea, bloating, vomiting	Check the child's clinical condition. Check if the child is constipated – if so the child may require a change in diet/medications. Review timing of medication and enteral feed. Discuss with the Dietitian re rate of feed. If the child with a jejunal device is vomiting milk feeds – check position of device. Consider slow gastric emptying. Seek Professional advice	To ensure child is not acutely unwell. Constipation can cause symptoms of nausea and vomiting. Child not able to tolerate amount of medications and enteral feed at the same time. Feed administered too quickly may cause nausea and vomiting Device may have become displaced.
8	Diarrhoea	Obtain a stool sample for organism and sensitivity and virology.if appropriate Discuss with the Dietitian as the feed may need to be reviewed. Review child's medications. Seek Professional advice Parental education re-managing diarrhoea and vomiting as part of discharge plan	Gastrointestinal infection may cause diarrhoea. Child could have feed intolerance. Intolerance of bolus feeds, may need slow continuous feed. Possible side effect of medication.
9	Constipation	Discuss with the Dietician with regards to the feed, amount of flush. Review medicines Child may require medication	Child may have feed intolerance, dehydration. Possible side effects to medication. Relieve constipation.

Glossary

Administration Set

Plastic tubing used to connect the container to the feeding device

Aseptic Non-Touch Technique (ANTT)

A unique and contemporary practice to reduce Healthcare associated infections using an aseptic technique

Aspiration

A procedure used to determine the position of the end of the tube. Aspiration also refers to the accidental sucking in of food particles or fluids into the lungs

Balloon

A water filled balloon holds some gastrostomy devices securely in the stomach

Bolus/Intermittent Feeding

A prescribed volume of feed given slowly via a syringe at a specific time.

Buried Bumper Syndrome

A rare complication which occurs when the internal plate has become buried in stomach wall.

Carer (caregiver)

Someone other than a health professional who is involved in caring for a person

with a medical condition.

Continuous feeding

Continuous feeds are the administration of a feed at a slower rate over a prolonged period.

Decanting

Pouring feed from the original container into the administration set container

Enteral nutrition

The provision of safe and effective nutritional support through the use of an enteral feeding device.

External Fixator

A device that holds the enteral tube in place against the skin.

Flush

Administering a small volume of water through the tube to clean it after you have used it to deliver your feed or medications.

Gastro-oesophageal reflux disease (GORD)

A common condition where acid from the stomach leaks out of the stomach and up into the oesophagus.

Gastrostomy Tube

Feeding devices which allow liquid feed, fluids and/ or medicines to be delivered directly into the stomach

Gastrojejunostomy tube

Enteral tube inserted through the abdominal wall which passes through the stomach into the jejunum for the purpose of nutrition support.

Hypoallergenic

Reduces the possibility of an allergic reaction

Immuno-compromised

Vulnerable to infection due to having an immune system that has been impaired by disease or a medical treatment

Jejunostomy Tube

A tube inserted directly into the jejunum (part of the small intestine)

Naso-duodenal tube

A polyurethane tube which is inserted via nose through the stomach and into either the duodenum or jejunum

Naso-gastric

A narrow tube that is passed into the nose and down the oesophagus into the stomach which allows liquid feed/medication to be delivered directly into stomach.

Naso-jejunal tube

A tube passed through the nose and down into the jejunum (the second part of the small intestine), thus bypassing the stomach and the duodenum.

Orogastric (tube) feeding

Nutrition support provided by a tube inserted through the mouth via the oesophagus into the stomach

Over granulation

Granulation tissue (natural healing process) beyond the amount required to replace the tissue loss as a result of skin injury or wound

PH Indicator Strips

Used to confirm the feeding device is in the correct position by measuring the amount of acid in the stomach contents.

Push/Pause technique

A pulsatile flushing action to promote a turbulence effect within the tube.

Single Use

Use only once and then discard

Single child use

Can be used more than once on one specific child only.

Stoma

A surgical created opening into the body from outside the body.

Venting

Venting is letting the air (wind) out of the stomach.

APPENDIX 1.

Discharge information for a child following insertion of an Enteral device				
Name	**Address**	**Date of Birth**	**Health Care Number**	**Childs Diagnosis/Reason for Enteral Device**
CCN Team	**CCN Contact Number**	**Date of 1st contact with CCN Team**	**Name of CCN contacted**	**Name of referring hospital nurse**
Date of discharge	**Name of CCN contacted**	**Name of referring hospital nurse**		
Date and method of surgery	**Type of enteral device**	**Size**	**Length**	**Replacement enteral device supplied YES/NO**
Supplies required		**Supplies to be provided before discharge**		
Feeding Regimen		**Child's Dietician Contact Details:**		
Type of feed	**Frequency of feed**	**Rate and volume of feed/flushes**		**Copy of Feeding Regime YES/NO**
Feeding pump required YES/NO	**Type of Feeding Pump required**			**Feeding pump provided Yes/NO**
Type of Training provided:	**Competencies obtained**			**Copy of Competencies included on discharge YES/NO**
Date of review appointments				
Parents' guide booklet provided to parents YES/NO				**Contact details completed YES/NO**
Referral to Community Dietician YES/NO	**Speech and Language Therapist YES/NO**			**PINNT YES/NO**

APPENDIX 2

IF THERE IS PAIN ON FEEDING,
OR EXTERNAL LEAKAGE
OF GASTRIC CONTENTS,
OR FRESH BLEEDING,
ADVISE CARERS TO STOP
FEED IMMEDIATELY AND
URGENTLY REFER TO
[appropriate 24/7 local service]

IF THERE IS PAIN ON FEEDING,
OR EXTERNAL LEAKAGE
OF GASTRIC CONTENTS,
OR FRESH BLEEDING,
ADVISE CARERS TO STOP
FEED IMMEDIATELY AND
URGENTLY REFER TO
[appropriate 24/7 local service]

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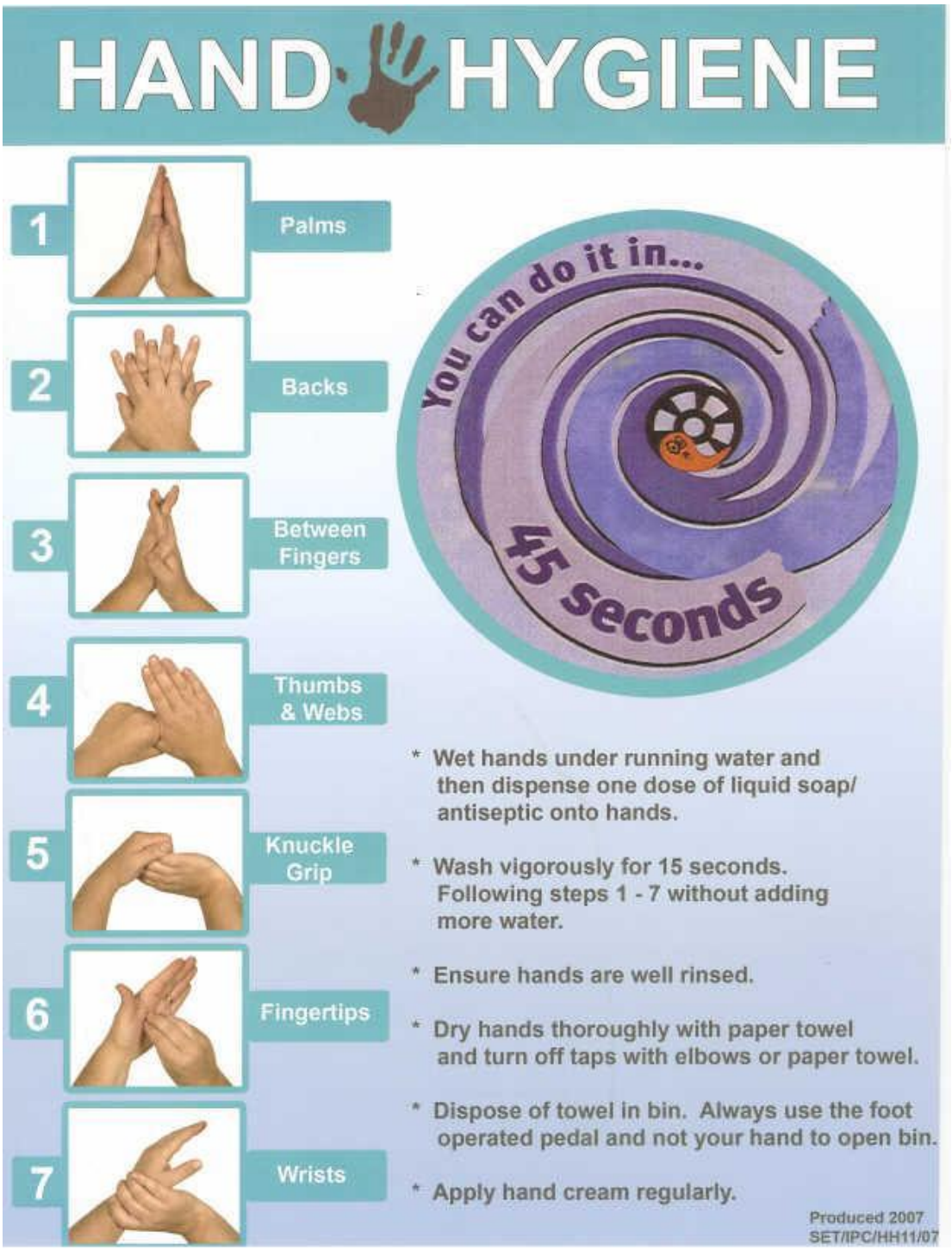
APPENDIX 3

Northern Ireland Regional Infection Control Manual**www.infectioncontrolmanual.co.ni**

Department of Health, Social Services and Public Safety
www.dhsspsni.gov.uk

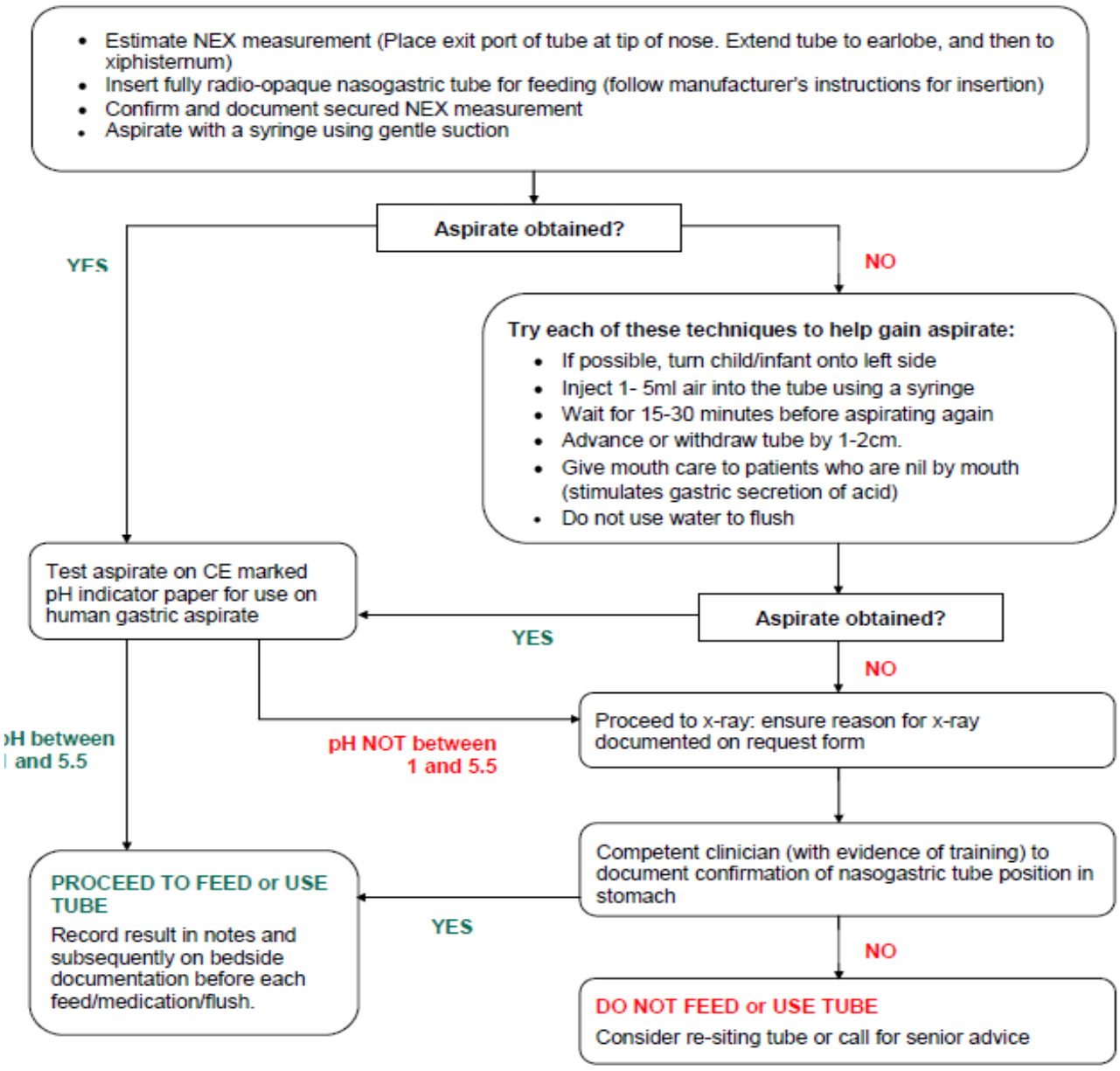
Sláinte, Seirbhísí Sóisialta agus Sábháilteachta Poiblí
Poustie, Resydènter Heisin an Fowk Siccar

NHS National Patient Safety Agency



APPENDIX 4

Decision tree for nasogastric tube placement checks in CHILDREN and INFANTS (NOT NEONATES)



A pH of between 1 and 5.5 is reliable confirmation that the tube is not in the lung, however it does not confirm gastric placement as there is a small chance the tube tip may sit in the oesophagus where it carries a higher risk of aspiration. If this is any concern, the patient should proceed to x-ray in order to confirm tube position.

Where pH readings fall between 5 and 6 it is recommended that a second competent person checks the reading or retests.

www.npsa.nhs.uk/alerts

APPENDIX 5

General guidance on administration of medicines via enteral feeding devices:

- ✓ Liquids or soluble tablets are usually the preferred formulation for enteral feed administration. Thick or viscous liquids may require further dilution with an equal amount of water immediately prior to administration
- ✓ Do **not** crush:
  - Buccal and sublingual tablets – these dosage forms are designed to allow the drug to avoid absorption via the stomach and break down by the liver. If these tablets are passed down an enteral feeding device, the drug effect will be decreased
  - Sustained release tablets (identified often by the letters LA, XL, SR, MR) – these dosage forms are intended to release a drug gradually over time. If these tablets are crushed, the full amount of the drug will be released exposing the patient to higher than normal levels of the drug which may increase the chance of side effects
  - Enteric coated (EC) tablets – these dosage forms have a special coating to prevent the drug dissolving in the stomach. If these tablets are crushed and passed down a enteral tube, there is an increased risk of side effects and possible decreased drug absorption
  - Chewable tablets – these dosage forms are formulated to allow partial drug absorption in the mouth. If the tablet is crushed, decreased drug absorption will occur
  - Cytotoxic tablets – there is risk of exposure to hazardous substances if crushed. Cytotoxics should be handled in accordance with local procedures
- ✓ Crush tablets or open capsules only after seeking advice from a Pharmacist. When advised to crush standard release tablets, ensure they are crushed well to prevent clogging of enteral tubes
- ✓ Never use boiling water to flush tubes following medicines administration as this may affect bioavailability of the drug
- ✓ Never leave medicines unattended in oral syringes
- ✓ Never administer any medicines via any route that you have not prepared yourself
- ✓ Never mix medicines together before administration as they may interact with each other and also you will be unable to determine how much of each medicine has been given if the tube subsequently blocks
- ✓ Never add medicines to feeds as you cannot predict the effect the medicine has on the physical stability of the feed and vice versa

([52] The NEWT Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties www.newtguidelines.com)

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LITERATURE SEARCH

Electronic searches using CINAHL, Clinical Key, Cochrane Library, EBSCO Biomedical, EMBASE, Internurse, Medline, Proquest Medical Library, Pubmed and Up To Date databases were used to identify published literature and studies relating to the support provided to parents/ carers of infants/ children/ young people who require enteral feeding up to and including December 2013.

Search terms included enteral nutrition, enteral feeding, enteral feeding pumps, feeding tubes, feeding tube care, Supplemental infant feeding, feeding of disabled, jejunostomy, gastrostomy, percutaneous endoscopic gastrostomy, PEG, gastrointestinal intubation, nasogastric intubation, nutritional support, artificial nutrition, caregivers, carer, parents, family, single-parent family, tube placement determination, bridling, nasal bridling, nasoenteral tubes, feeding tube irrigation, irrigation, flushing, medication, medication systems, drug delivery systems, drug delivery routes, drug administration routes, medication delivery, flushing medication, medication flushing, medicines, pharmaceutical preparations, oral hygiene, oral health, dental care, oral care, mouth care, equipment and supplies, syringes, enteral syringes, flushing device, flushing enteral device with 'and/or' used as a Boolean operator.

All languages were included. The bibliographies of all included studies were also searched.

Searches were also carried out to identify existing guidelines on enteral feeding and support provision to parents/ carers. These included:

- National Institute of Clinical Excellence (NICE)
- Guidelines and Audit Implementation Network (GAIN)
- Clinical Resource Efficiency Support Team (CREST)
- Scottish Intercollegiate Guideline Network (SIGN)
- NHS Wales
- NHS Evidence
- Regulation and Quality Improvement Authority (RQIA)
- Guidelines International Network (GIN)
- Guidelines Clearing House
- British Association for Parenteral and Enteral Nutrition (BAPEN)
- The Irish Society for Clinical Nutrition and Metabolism (IrSPEN)
- The European Society for Clinical Nutrition and Metabolism (ESPEN)
- American Society for Parenteral and Enteral Nutrition (ASPEN)
- The Parenteral and Enteral Nutrition Group of the British Dietetic Association (PENG)
- National Patient Safety Association (NPSA)
- Patients on Intravenous and Naso-Gastric Nutrition Therapy (PINNT)

Equality Screening

This guidance has been drawn up and reviewed in the light of Section 75 of the Northern Ireland Act (1998) which requires Trusts to have due regard to the need to promote equality of opportunity. It has been screened by the WHSCT to identify any adverse impact on the 9 equality categories and no significant adverse impacts were identified, therefore, an Equality Impact Assessment is not required.

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