



HOME ENTERAL FEEDING

RESOURCE PACK

**Nutrition Support Interest Group (NSIG) of the
Irish Nutrition and Dietetic Institute (INDI)**

*Adapted from the CREST Guidelines for Management of
Enteral Tube Feeds in Adults*

CONTENTS

Introduction and Abbreviations	Page 3
Management of Tube Sites (Stomas)	Page 4
Management of Enteral Feeding Tubes	Page 8
Oral Hygiene	Page 11
General Set-up and Discharge	Page 15
Drug Administration	Page 20
Complications: Abdominal Distension	Page 23
Complications: Constipation	Page 25
Complications: Diarrhoea	Page 27
Complications: Aspiration	Page 29
Complications: Oesophageal Reflux	Page 30
Complications: Nausea and Vomiting	Page 31
Appendices:	
Appendix 1: Medication Administration	Page 33
Appendix 2: Constipation	Page 37
Appendix 3: Diarrhoea	Page 39
Appendix 4: Gastrostomy feeding tube types	Page 44
Appendix 5: Jejunostomy feeding tube types	Page 54

INTRODUCTION

- Enteral tube feeding in the community can be a challenging task for the patient, their carer and the multi-disciplinary team managing the patient. Furthermore standards of care and practice, as well as support, can vary throughout the country resulting in a different experience for each patient.
- The aim of the Nutrition Support Interest Group (NSIG) of the Irish Nutrition and Dietetic Institute (INDI) in producing this resource pack was to outline the most up to date guidelines and recommendations for health care professionals on the management of home/nursing home enteral tube feeding.
- These guidelines were initially developed using information from the Clinical Resource Efficiency Support Team (CREST) guidelines for 'The management of enteral tube feeding in adults'. They are designed to offer practical advice on issues such as management of the stoma tract, managing complications (such as diarrhoea and constipation), and drug administration.
- This resource pack was updated in 2015 by a NSIG subgroup: Olive Nolan, Cathy O'Neill and Michelle Fanning.

These guidelines are intended to provide evidence based practical information for the management of tube fed patients in the community, where local policy and knowledge

This pack is not intended to replace local policy or the advice of a local healthcare professional.

are not available.

It is recommended that nutritional assessment and nutritional review of patients on home enteral tube feeding should be carried out intermittently, or as indicated, by a dietitian.

ABBREVIATIONS

NG	Nasogastric
PEG	Percutaneous Endoscopic Gastrostomy
RIG	Radiologically Inserted Gastrostomy
RIJ	Radiologically Inserted Jejunostomy
GP	General Practitioner
PHN	Public Health Nurse
Fr	French size
BRT	Balloon retention tube
LPGD	Low Profile Gastrostomy Device

1. MANAGEMENT OF TUBE SITES (STOMAS)

1.1 Aim

To promote best practice in the care of gastrostomy and jejunostomy tube sites (stomas).

1.2 Objectives

To provide practical advice on:

- a) Initial care of the stoma site.
- b) Longterm care of the stoma site.
- c) Common problems encountered with the stoma site.

1.3 Stoma site management

1.3(a) 0 to 72 hours post-insertion:

Potential Problem	Action/Prevention
Pain at site post operatively	Do not touch site and tube for 8–12 hours Administer analgesia if appropriate.
Infection	Observe for signs of swelling, bleeding or infection. Use aseptic technique for first 72 hours. Cleanse site and fixation device twice daily with sterile 0.9% saline solution or soap & water or as per manufacturer's instructions. Dry thoroughly. Keep area clean and dry. Apply dressing if required to absorb exudate.
Tube and fixation device damage	Do not release the fixation device for at least the first 72 hours or follow manufacturer's instructions. Refer to any specific instructions from clinician who inserted tube.

1.3(b) After 72 hours:

Potential Problem	Action/Prevention
Infection	Observe for signs of swelling, bleeding or infection. Use clean technique after 72 hours until tract is healed. Allow 21 days for the tract to heal. Keep area clean and dry. Apply dressing if required to absorb exudates.
Tube and fixation device damage	Follow the manufacturer's or local guidelines specific to tube type. In general, non-sutured gastrostomy tubes can be rotated daily by 360°. This may not be suitable for RIG tubes depending on internal fixation device. Some RIG tubes are kept in place with a pigtail and are easily dislodged. Jejunostomy tubes should not be rotated. Do not release fixation device.
Personal Hygiene	Ensure patient's personal hygiene needs are met. Baths should not be used until the tract has healed – daily showers can be taken instead. Avoid the use of strong soaps, powders and creams.

1.3(c) When tract has healed:

Most tracts heal within 3 weeks of tube insertion. Good hygiene practices should be used daily:

- Ensure the tube and fixation device are cleaned carefully with a mild soap and dried thoroughly.
- Ensure the tube and fixation device are in their correct position after cleaning.
- Ensure the gastrostomy tube or LPGD is rotated as per manufacturer's recommendations. **Jejunostomy tubes should not be rotated.**
- Avoid the use of dressings if the stoma site is dry. If a dressing is required apply a keyhole dressing after cleaning.

Swimming is allowed 6 weeks post tube insertion, providing the stoma is not infected or sore.

1.4 Trouble shooting

1.4(a) Gastrostomy sites:

Potential Problem	Potential Cause	Action
Infection or exudation around stoma site/tract.		<ul style="list-style-type: none"> ✓ Observe the site daily for pain, erythema, pus, or skin breakdown. ✓ Check position of fixation device and correct if necessary. ✓ At the first signs of infection, send a swab for culture and sensitivity. Inform the medical practitioner. ✓ Administer the appropriate systemic antibiotics if required. <p>Note: Avoid the use of topical antibiotics.</p> <ul style="list-style-type: none"> ✓ Commence cleaning the site at least twice daily with soap and water, or saline, or apply povidone-iodine to the site. This can be used for up to 7 days. ✓ Avoid a dressing if at all possible, but if leakage is excessive, a small dry dressing may be applied and changed at least twice daily, or as necessary. <p>Note: Do not use creams or ointments when cleaning, as these may loosen the fixation device. (barrier creams can be used with button gastrostomies only)</p> <ul style="list-style-type: none"> ✓ Monitor the integrity of the tube and check that it is not cracked, or leaking. ✓ Contact the appropriate personnel (see appendix 4), for elective replacement of the gastrostomy tube, if the tube is damaged.
Overgrowth of granulation tissue.	<p>Fixation device may be too tight or too loose.</p> <p>Leaking gastrostomy tube.</p>	<ul style="list-style-type: none"> ✓ Check that the fixation device is able to move in and out about ¼ inch (6mm). ✓ Ensure tube rotation as per manufacturer's guidance. ✓ Persistent over-granulation may require treatment under the supervision of the Tissue Viability Nurse. It may also require debridement by appropriate personnel, and so advice on treatment should be sought.
Leakage around site of all tubes.	<p>Internal bumper is not taut against the stomach wall.</p> <p>Fixation device is too loose, allowing leakage of gastric juices or feed onto the skin.</p>	<ul style="list-style-type: none"> ✓ There should be a 3mm gap between the abdomen and external fixation device. ✓ Tighten fixation device so the tube is only able to move ¼ inch (6mm). ✓ Avoid the use of barrier creams (unless button gastrostomy is present), as they may cause the fixation device to loosen. ✓ Keep the site clean and dry.

Potential Problem	Potential Cause	Action
Leakage around site of all tubes (continued).	<p>Lumen of stoma tract may be bigger than the replacement gastrostomy tube.</p> <p>Delayed gastric emptying.</p> <p>Intestinal obstruction, including constipation</p>	<ul style="list-style-type: none"> ✓ Ensure that the correct size of gastrostomy feeding tube is in position. If necessary, refer to the doctor or relevant hospital for review / replacement of tube. ✓ Observe the patient for signs of abdominal discomfort or distension. ✓ Refer to the doctor for monitoring of same and consider use of gut motility drugs. ✓ If problem persists, it may be necessary to consider feeding beyond the stomach, into the jejunum. Refer the patient back to the hospital for assessment. ✓ Observe the patient for signs of abdominal discomfort or distension. Refer to section 7: Complications: constipation. If necessary, seek medical advice.
Leakage around LPGD gastrostomy.	<p>LPGD may leak because:</p> <p>It requires decompression with a decompression tube.</p> <p>The anti-reflux valve is no longer working, and so decompression is no longer effective.</p> <p>The patient has lost weight and the tube is now loose.</p>	<ul style="list-style-type: none"> ✓ See manufacturer's instructions on how to decompress with the appropriate tube. ✓ The tube needs to be removed and replaced by appropriately trained personnel. ✓ Another tube of the correct size needs to be fitted by appropriately trained personnel. <p>Note: it may be possible to use an appropriate barrier cream to protect the skin.</p>

1.4(b) Jejunostomy sites:

As jejunostomy tubes vary, refer to manufacturer's guidelines or local policy for advice on management. Refer any other problems to the hospital for specialist advice.

References:

1. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.
2. An Bord Altranais (2002) Recording Clinical Practice Guidance for Nurses and Midwives (1st ed.), Dublin, An Bord Altranais.

2. MANAGEMENT OF ENTERAL FEEDING TUBES

2.1 Aim

To promote best practice in the care of feeding tubes, thereby helping to prevent problems.

2.2 Objectives

- To provide practical advice on flushing tubes.
- To provide practical advice on managing blockages.

2.3 Flushing of feeding tubes

2.3(a) Rationale:

Feeding tubes must be flushed with water before and after feeding, and before and after administration of medication. Additional flushes may be required to meet a patient's daily fluid requirement. The volume and frequency of flushing should be specified in the patient's individualised feeding regime.

2.3(b) Water used for flushing:

In Hospital/Nursing Home/Residential Home/Day Care Centre/Home:

Always follow specific instructions from referring hospital or dietitian.

Sterile water or cooled boiled water should be used for all patients on enteral tube feeding (newly inserted and well established tubes).

- The choice of water used will depend on a risk assessment of the patient, and the care environment.
- For a patient at increased risk of infection, sterile water should be considered. Once opened, the bottle of sterile water should be labelled with the time and date of opening and should be discarded after 24 hours.
- If using cooled boiled water, this requires special attention to good practice, using freshly drawn tap water from the drinking supply. After boiling, this water must be stored in a clean covered container in a refrigerator. Any unused water must be discarded after 24 hours.

Bottled mineral water is not sterile.

2.3(c) Syringes used for flushing:

In Hospital / Nursing Home / Residential Home / Day Care Centre/Home

- A 50ml oral/enteral syringe should only be used for flushing enteral feeding tubes.

- When administering medications, *smaller syringes may be more appropriate for accuracy.
- A new syringe must always be used each time the tube is flushed or the patient receives medication. Alternatively, specifically designed reusable syringes are available. Follow manufacture guidelines on cleaning.
- If a patient is identified as having an increased risk of infection, a new oral/enteral syringe must be used each time the tube is flushed.

****Smaller syringes produce greater pressure and may split the tube, therefore, if used for medication delivery, administer slowly.***

2.4 Checking nasogastric tube position:

External tube length measurement and marking is a bedside method to check for possible tube dislodgement. When feed is being administered through a nasogastric (NG) feeding tube the position of the NG tube should be confirmed daily. In hospital the gold standard for checking initial tube position is chest X-ray. However, in the community, pH testing of gastric aspirate using pH indicator strips is considered a reliable method of confirming tube position. A pH of 5.5 or below will indicate correct positioning of NG tube in most patients. There are no known reports of pulmonary aspirates at or below this figure (NPSA Feb 2005).

2.5 The management of blocked feeding tubes

Problem	Possible Cause	Action
Tube Blockage.		DO NOT attempt to unblock the tube with a guidewire, as this may perforate the side of the tube.
	Lack of Flushing.	Adherence to a meticulous flushing regimen as outlined in section 2.3 is essential in the prevention of tube blockage.
		DO NOT use smaller than a 50mls oral, enteral or catheter tipped syringe. A smaller syringe will exert a higher pressure and possibly split the enteral tube. Flush the water gently into the tube
	Build up of feed/medications.	Ensure the correct method of administration of medications. See section 5.
		1. Try to unblock the tube with 50mls of luke warm sterile water.
		2. If still blocked try the manufacturers recommended enzyme compound to digest the blockage. This should be used following manufacturer's instructions.
		3. If no recommendations are made, try the pancreatic enzyme solution as outlined below*.
		DO NOT use pineapple juice, coca cola or other carbonated or sugary drinks. The pH is too low which can cause the feed to clot.

***Pancreatic Enzyme Solution**

- i. In 20ml of sterile water, mix the contents of 3 capsules of a pancreatic enzyme preparation with ½ teaspoon sodium bicarbonate.
- ii. Flush the tube with the above solution and leave in place for 30 minutes. Then, flush with 50mls of sterile water.

***If a tube blockage cannot be cleared, seek specialist advice.
Do not use excessive force.***

2.6 Tube Replacement

Refer to manufacturer's guidelines regarding lifespan of tube and liaise with hospital regarding planned tube replacement.

References:

1. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.
2. National Patient Safety Agency (NPSA), 2005. Patient Safety Alert – reducing the harm caused by misplaced nasogastric feeding tubes, **www.npsa.nhs.uk**
3. Pellowe CM, et al. Guideline Development Group. Evidence based guidelines for preventing healthcare associated infections in primary and community care in England. *Journal of Hospital Infection*, 2003;55(2):88-104.
4. Anderton A. Microbial contamination of enteral tube feeds: How can we reduce the risks? Trowbridge UK: Nutricia 2000.

3. ORAL HYGIENE

3.1 Aims

Good oral hygiene needs to be maintained in all patients to ensure dental plaque is removed and pathogenic organisms are not allowed to proliferate in the mouth.

3.2 Objectives

- To encourage good oral hygiene procedures from the start of enteral tube feeding.
- To prevent the need for high-risk treatment later and reduce the incidence of oral dental disease.
- To reduce the risk of aspiration pneumonia secondary to poor oral hygiene.

3.3 Mouth care

3.3(a) Rationale:

Many tube fed patients are at an increased risk of developing poor oral health due to:

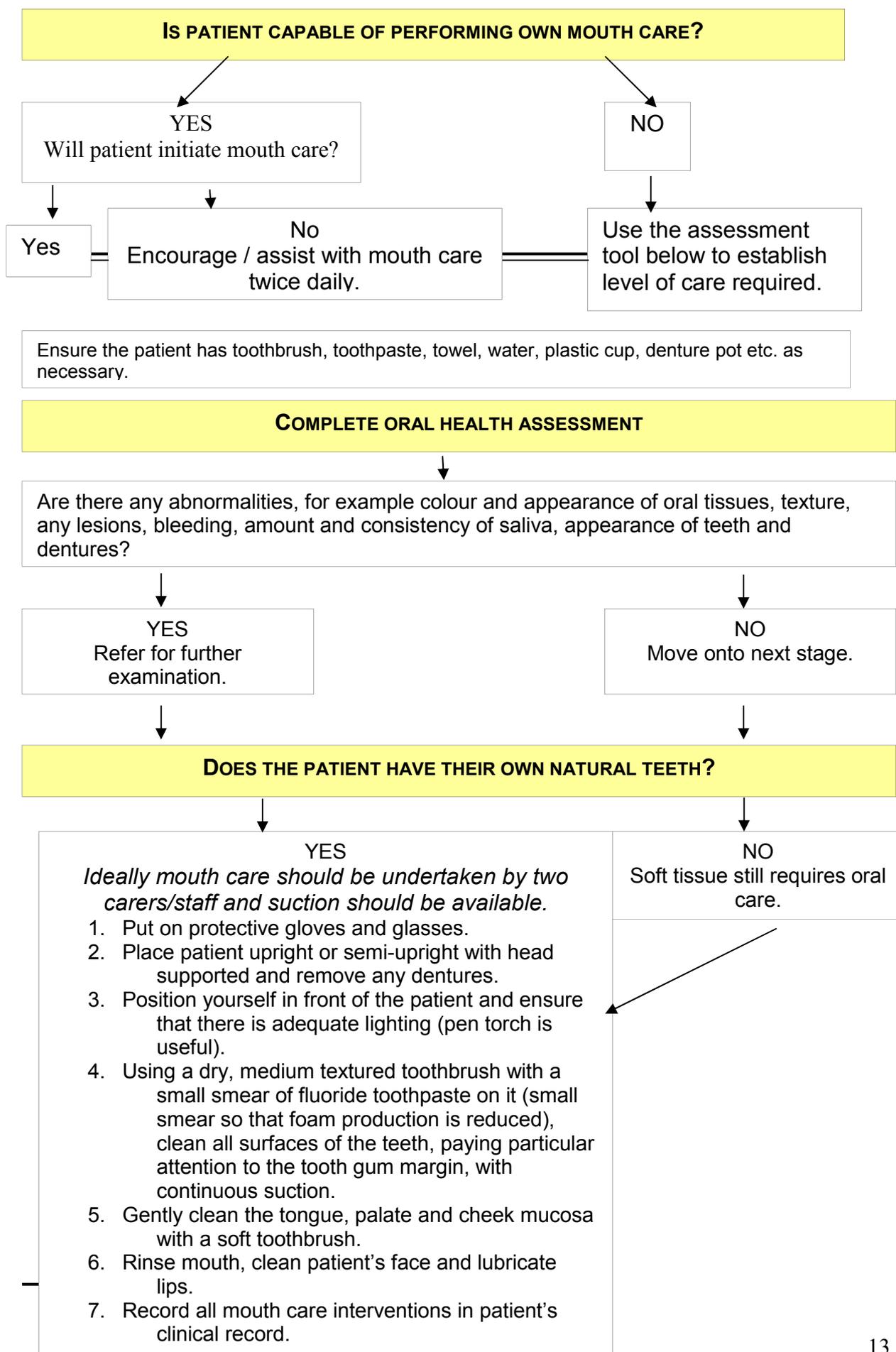
- I. Their lack of personal perception of oral health problems.
- II. Their inability to articulate a need.
- III. Their reduced salivary flow due to polypharmacy and concomitant disease.

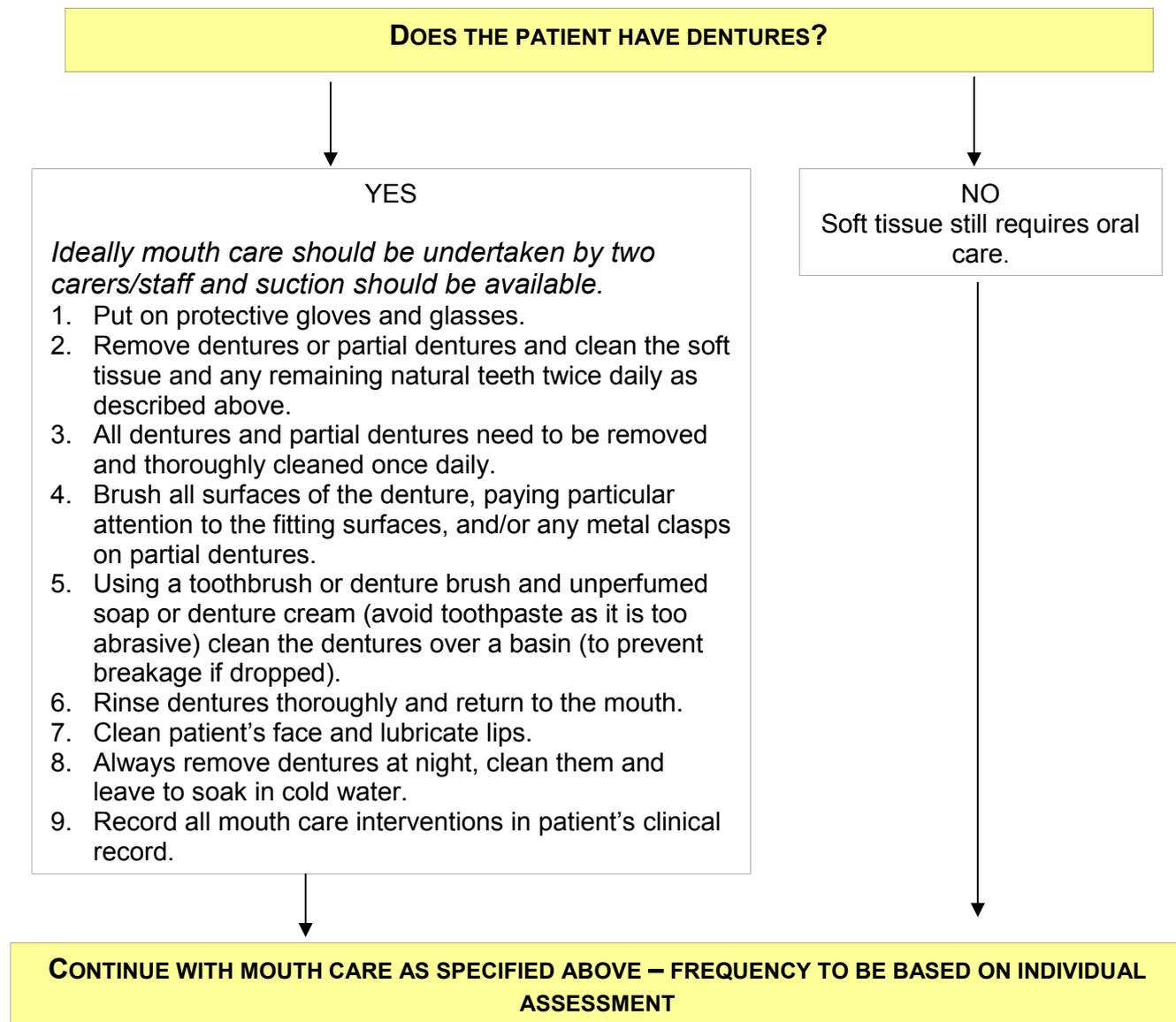
When tube feeding is commenced each patient's oral health should be assessed and pre-existing disease recognised. Patients with pre-existing disease should be referred to the dentist for further examination. An appropriate oral care protocol should be used for every patient on tube feeding (see figure 1).

3.3(a) Mouth care complications:

PROBLEM	POSSIBLE CAUSE	SIGNS & SYMPTOMS	SUGGESTED SOLUTION
Persistent Oral Infections.	<ul style="list-style-type: none"> ▪ Poor oral hygiene. ▪ Illness. ▪ Stress. ▪ Longterm use of corticosteroids &/or medications that suppress the immune system. ▪ Immune Disorders (e.g. HIV). ▪ Long-term use of antibiotics. ▪ Uncontrolled Diabetes. ▪ Hormonal changes associated with pregnancy and birth control pills. 	<p>Painful raised skin ulcer on tongue or inner cheek. May have creamy white appearance &/or have a curd like appearance.</p> <p>Dry Mouth.</p>	<ol style="list-style-type: none"> 1. Do not stop the patient's tube feed and prescribed water flushes. 2. Maintain a high standard of oral hygiene (see figure 1). 3. Refer the patient to dentist for treatment and/or advice. 4. Refer the patient to their medical team / general practitioner for medical assessment, medication review and advice. 5. In the case of uncontrolled diabetes refer the patient to their dietitian for review of their feed.
Xerostomia / Dry Mouth.	<ul style="list-style-type: none"> ▪ Poor oral hygiene. ▪ Insufficient fluid intake. ▪ Decreased saliva. ▪ Mouth breathing. ▪ Usage of an oxygen mask. ▪ Medications and/or treatment. ▪ Nasal congestion. 	<p>Dried, flaky, whitish colored saliva.</p> <p>Thick saliva or mucus that stays attached to the lips like strings.</p> <p>Dry, cracked or chapped lips.</p> <p>Increased difficulty swallowing.</p> <p>Mouth odour.</p>	<ol style="list-style-type: none"> 1. Do not stop the patient's tube feed and prescribed water flushes. 2. Maintain a high standard of oral hygiene (see figure 1). 3. Maintain an accurate fluid balance chart. 4. Refer the patient to their dietitian for review of their feed and fluid intake. 5. Refer the patient to their medical team / general practitioner for medical assessment, medication review and advice. 6. In the case of a reduced saliva production prescription of an artificial saliva can be helpful.
Dental Caries /Tooth Decay.	<ul style="list-style-type: none"> ▪ Poor oral hygiene. ▪ Intake of sugary foods. 	<p>Toothache.</p> <p>Visible pits or holes in teeth.</p>	<ol style="list-style-type: none"> 1. Do not stop the patient's tube feed and prescribed water flushes. 2. Maintain a high standard of oral hygiene (see Figure 1). 3. Refer the patient to the dentist for treatment & / or advice.

Figure 1
Example Oral Care Guideline





References

1. Management of patients with stroke: Identification and Management of dysphagia (A national clinical guide). Scottish Intercollegiate Guidelines Network (S.I.G.N.). September 2004.
2. Pajukoski H et al, Salivary flow and composition in elderly patients referred to an acute geriatric ward. Oral Surg Oral Med Oral Path Oral Radiol Endod. 1997 Sept; 84(3): 265-71.
3. Guidelines for Oral Health Care for Longstay Patients and Residents. British Society for Disability and Oral Health (BSDH). Jan 2000.
4. Guidelines for the management of Enteral Tube feeding in Adults. CREST. April 2004.

4. GENERAL SET-UP AND DISCHARGE

4.1 Aim

To promote a safe discharge process for patients being discharged into the community on enteral tube feeding. The patient and/or carer(s) should understand the rationale for home tube feeding, and should demonstrate competence in feed set up and administration pre-discharge.

4.2 Objectives

- To plan the discharge process as early as possible.
- To provide adequate training and education for the patient and/or carer(s).
- To liaise effectively with the community care team.

4.3 Education & training checklist

4.3(a) Pre-discharge, the patient and/or carer should have achieved competency in the following:

Feeding tube-related:

- Checking tube position, if applicable.
- Securing the tube adequately.
- Flushing the tube – knowing how, when and how often to flush the tube.
- Techniques to unblock a feeding tube.
- Checking and replacing the sterile water in the balloon of a balloon gastrostomy feeding tube.
- Management of plastics, such as giving sets, Y adaptors/connectors, extension sets, syringes.

Feed set-up if pump feeding:

- Hand washing before feed set-up.
- Preparing the feed.
- Connecting the feed container to a giving set.
- Setting up the feed container and feed pump on a drip stand or ambulatory pack.
- Priming the feed partially through the giving set, if applicable.
- Connecting the giving set to the feed pump.
- Use of the feed pump and adjustment of the pump settings.
- Trouble shooting with regard to feeding pump.
- Connecting the giving set to the feeding tube and administering the feed.

Feed set-up if bolus feeding:

- Hand washing before feed set-up.
- Preparing the feed.
- Flushing the feeding tube before and after each feed.
- Administering the feed.

4.3(b) Pre-discharge, the patient +/-or carer should be aware of:

- All relevant contact numbers.
- The patient's nutritional care plan.
- The roles and responsibilities of those involved.
- Funding and sourcing of feed and equipment.
- Collection/delivery arrangements for plastics, this can vary.
- Appropriate storage of feed and hanging times.
- The rate and duration of feeds – if pump feeding; the number, volume and timing of feeds – if bolus feeding.
- The importance of good oral care, whether eating or not.
- The importance of flushing the feeding tube and the correct administration of medications.
- Care of stoma site and rotation of feeding tube, if applicable.
- The importance of detecting and reporting any problems to the relevant personnel.
- The importance of follow-up (although the degree of follow-up available may vary significantly from patient to patient, from hospital to hospital, and from community to community).

If oral diet and fluid are allowed, the patient +/-or carer should be aware of texture modifications, as indicated.

4.4 Equipment & feed

The patient should be discharged home with a:

- Supply of feed for 7 days.
- Supply of giving sets for 7 days – if pump feeding is planned.
- Drip stand or ambulatory pack – if pump feeding is planned.
- Feeding pump – if pump feeding is planned.
- Supply of syringes, appropriate to the feeding tube in situ.
- Supply of pH indicator strips – if nasogastric tube is in situ.
- Nasal bandages – if nasogastric or nasoenteric tube is in situ.
- *According to local policy, the following equipment may also be provided:*
 - Supply of extension sets – if button gastrostomy is in situ, or balloon gastrostomy, if applicable.
 - Replacement balloon gastrostomy tube(s), if needed.
 - Replacement adaptors, if needed.

4.5 Communication and documentation

Pre-discharge:

- The patient should be enrolled on the hospital-to-home scheme of the relevant nutrition company, where such a scheme exists.
- The patient should be registered on a local home enteral feeding register, where this exists.
- Baseline information concerning the home feeding and the feeding tube should be faxed or posted to:
 - Patient's GP.
 - Patient's local PHN/ Nursing Home Staff.
 - Liaison PHN, as appropriate.
 - Community Dietitian (where available).
- An application for funding of plastics is faxed or posted to the Community Care Appliance Officer, or the Director of Community Care.
- The patient's pharmacy may be contacted by phone regarding feed order.
- Prescription for feed +/- plastics is organised with the hospital's medical team.
- An information pack should be provided for patient and/or carer(s), which may include:
 - Copy of feeding regimen.
 - Written information on pump and feed set up and administration – manufacturer's support literature.
 - Information on feeding tube.
 - Written information on troubleshooting.
 - Relevant prescriptions.
 - Funding information.
 - Contact information.
 - Home feeding booklets, if available.
 - Care of stoma information, if applicable.
 - Written instructions on checking and replacing water in the balloon of a balloon gastrostomy feeding tube, if present.
- Home feeding arrangements are documented in medical chart and in dietetic and nursing records.

Patients discharged on nasogastric feeds should be referred back to the hospital for gastrostomy assessment if feeds continue for one month or more.

4.6 Funding

4.6(a) Medical card holders:

The patient's medical card will cover the cost of their feeds. However, special application must be made to the Administrator/General Manager in the Appliance Department, or relevant budget holder for the area in which the patient lives for funding plastics, i.e. giving sets, syringes, feed containers, spare Y-adaptors/connectors or spare gastrostomy tubes, and sterile water, as indicated.

This letter of request should be sent (faxed) as soon as the decision has been made to discharge the patient on enteral feeding.

The feed comes from the chemist. The giving sets (and feed containers if required) usually come from the health centre, except in some areas, e.g. pharmacies in the Midlands and the Mid- West may also provide giving sets. The patient will need to get a prescription from their GP every month for the feed. The public health nurse (PHN) will also need to order giving sets, syringes (and feed containers if needed) every month.

A patient may have a GP Visit Card. Only the cost of visits to the family doctor is free; prescribed drugs, medicines and other health services must be paid for similar to if you don't have a Medical Card. Any product required for the patient without a GMS number can be applied for through the HSE Hardship Scheme.

4.6(b) Long-term Illness Card(LTI):

Long-term illness cards cover the cost of the feed and plastics. The feed is available from the chemist, and the giving sets and syringes are available from the community, usually through the PHN. In some areas, e.g. the Midlands and the Mid -West, giving sets may also be available from the patient's pharmacy. The patient will need a prescription for their feed, giving sets, and feed containers (if needed) from their GP every month. Only certain medical conditions are covered by the LTI- see table 4.6 for details.

Table 4.6 Medical conditions covered by the LTI Scheme

Mental handicap	Haemophilia	Muscular dystrophy
Mental illness	Cerebral palsy	Spina bifida
(< 16 years of age)	Epilepsy	Multiple sclerosis
Phenylketonuria	Diabetes mellitus	Hydrocephalus
Cystic fibrosis	Acute leukaemia	Conditions arising from
Diabetes insipidus	Parkinsonism	the use of Thalidomide

4.6(c) Drugs Payment Scheme (DPS):

Where a patient's care is not covered by a medical card, or a long-term illness card, an application should be made for the costs of enteral feeds and feeding equipment supplies to be covered by the DPS. Under this scheme, the patient will have to pay no more than 144 Euro per calendar month (January 2014). This will also cover the cost of any other GMS listed items/drugs prescribed for that patient. The scheme is aimed at those who don't have a medical card. All items must be purchased by all family members in the **same pharmacy** to qualify for the scheme. Only products with a GMS code can be reimbursed under this scheme. Enquire with the patient's pharmacy to see if they can avail of any other schemes to receive reimbursement for non-GMS products as in some circumstances they may be able to order the patient's plastics as well. Sterile water is not covered by the DPS and the cost will have to be incurred by the nursing home or by the patient.

If equipment is being supplied through the DPS, all feeding equipment must be on prescription from the GP or referring hospital.

4.6(d) Nursing Home Transfers:

In some cases the nursing home will arrange funding once notified of requirements. This may differ in some areas, e.g. in the Midlands, where the dietitian/clinical nutritionist applies for funding. However, an application for funding may be required so always contact the nursing home to clarify. Where a patient is being transferred to a public bed in a Private Nursing Home, an application for funding may have to be made via the Area Administrator. If the patient has a DPS card then the pharmacy linked to the card will need to be used for feed. In some cases equipment may also be ordered through the pharmacy, if not then a funding request will also have to be sent to the Area Administrator. Provision of feed and equipment will depend on whether the patient has a medical card or not.

5. DRUG ADMINISTRATION

5.1 Aim:

To provide information on drug administration via enteral feeding tubes, where oral administration is not safe or not feasible. This must be considered in the knowledge that there is no drug licensed for administration through enteral feeding tubes, but that in many cases there is no other option.

5.2 Objectives:

To give practical advice on:

- Route of administration.
- Choice of drug and formulation to be used.
- Precautions during drug administration.
- Drug-feed interactions.

5.3 Route of administration:

- Where possible, an alternative route of administration should be considered, such as topical/transdermal, rectal or parenteral administration. This may necessitate a medication change.
- Consideration should be given to the type of feeding tube being used and the site of drug absorption. Some drugs favour the acidic conditions of the stomach for absorption. These drugs may be incompletely absorbed if administered directly into the jejunum, through a nasojejunal or jejunostomy tube.

Never add medications directly into enteral feed.

5.4 Drug Formulations:

5.4(a) Review of medications:

The medical team should review all medications prescribed for each patient commencing enteral feeding. Drugs considered to be non-essential in the short-term may be withheld.

5.4(b) Drugs in liquid form:

- Liquid forms of medications are generally preferable for administration through enteral feeding tubes. These include: syrups, linctus, elixirs, suspensions, solutions, and dispersible, effervescent or soluble tablets.
- Not all drugs are available commercially as liquids. A pharmacist may be able to prepare certain liquid preparations on request. The pharmacist must be made aware of the route of administration.
- Liquid drugs may not always be the best option. They may cause cramping and diarrhoea, particularly in post-pyloric feeding. This may be due to the hyperosmolar nature of some liquid formulations, especially if sorbitol is present.
- Many liquid medications are designed for children, and so are of low strength. For adults, larger volumes may be needed. Many are thick and viscous and may cause problems when administered through narrow tubes. Not all suspensions can be diluted to reduce viscosity.

- A change in medication formulation may require a change in dosage.

5.4(c) Drugs in solid form:

- **Uncoated tablets:** These may be crushed with care at the bedside and administered immediately. Do not mix powders. Always wear gloves.
- **Coated tablets:** Do not crush enteric-coated, sugar-coated, or modified-release tablets. Consult a pharmacist for advice and advise the prescribing team accordingly.
- **Capsules:** Hard gelatine capsules can be opened and the contents given via the enteral tube, provided that they are not modified-release capsules. Soft gelatine capsules can be punctured with a sterile wide bore needle, the liquid withdrawn, and given by syringe through the enteral tube.
- **Cytotoxic drugs and hormones:** These should never be crushed.
- **Sublingual, buccal, “melt” and chewable tablets:** These should not be given through enteral feeding tubes.

5.5 Precautions when administering medications:

- Giving a crushed tablet in water may block a feeding tube. Fine bore nasogastric and nasoenteric feeding tubes are long and narrow, and block easily. Gastrostomy tubes are shorter and have a wider bore, but are still at risk of blockage from medications. Radiologically inserted gastrostomy feeding (RIG) tubes are generally 12Fr or 14Fr and are, therefore, more likely to block. **Jejunostomy tubes are narrow and block easily.**
- Adequate flushing of feeding tubes is essential to ensure that the full dose of a medication is delivered, and to ensure that the patency of the tube is maintained.
- Water should be used for flushing. The type of water depends on the risk assessment of both the patient and the care environment. Generally, in the home, cooled boiled water is used for feeding tubes, although some prefer use of sterile water with jejunostomy tubes. Sterile water is generally used in hospital (see 2.3).
- For adults, 30ml of water should be used for flushing tubes before and after medication administration. Larger water flushes may sometimes be indicated.
- When several drugs are being given, each should be given separately, and should not be mixed. The tube should be flushed with 5-10ml of water between each drug.
- Flushes should be considered if calculating fluid balance for patients on a fluid restriction, or at risk of fluid overload.

5.6 Drug-feed interactions:

As a general rule, drugs recommended for administration on an empty stomach, should not be given at the same time as an enteral feed. Feeds may need to be stopped before and/or after administration. Consult a pharmacist for clarification. For specific guidelines regarding the administration of certain medications to patients on enteral feeds – see *appendix 1*.

Seek advice from your community pharmacist on any medication issues.

References:

1. Mater Misericordiae University Hospital 'Prescribers Guide 2005-2006'.
2. The Royal Hospitals Belfast 'Administration of Drugs Through Enteral Feeding Tubes' guide 2000.
3. Oxford International Centre for Palliative Care 2002.
4. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.

6. COMPLICATIONS: ABDOMINAL DISTENTION

6.1 Aim

To provide practical information on the occurrence and management of abdominal distension in enteral tube fed patients.

6.2 Objectives

To outline causes and symptoms of abdominal distension in enteral tube fed patients. To outline suggested solutions and management plan for patients with abdominal distension.

6.3 Definition

- Increased abdominal girth due to raised intra-abdominal pressure.
- May be mild or severe, localised or diffuse, or of gradual or sudden onset (acute form may indicate life threatening peritonitis or obstruction).

6.4 Symptoms

- Distension localised or generalised. Observe for tense, glistening skin and bulging flanks typical of ascites.
- Umbilicus – everted suggests ascites or hernia; inverted suggests gas or obesity.

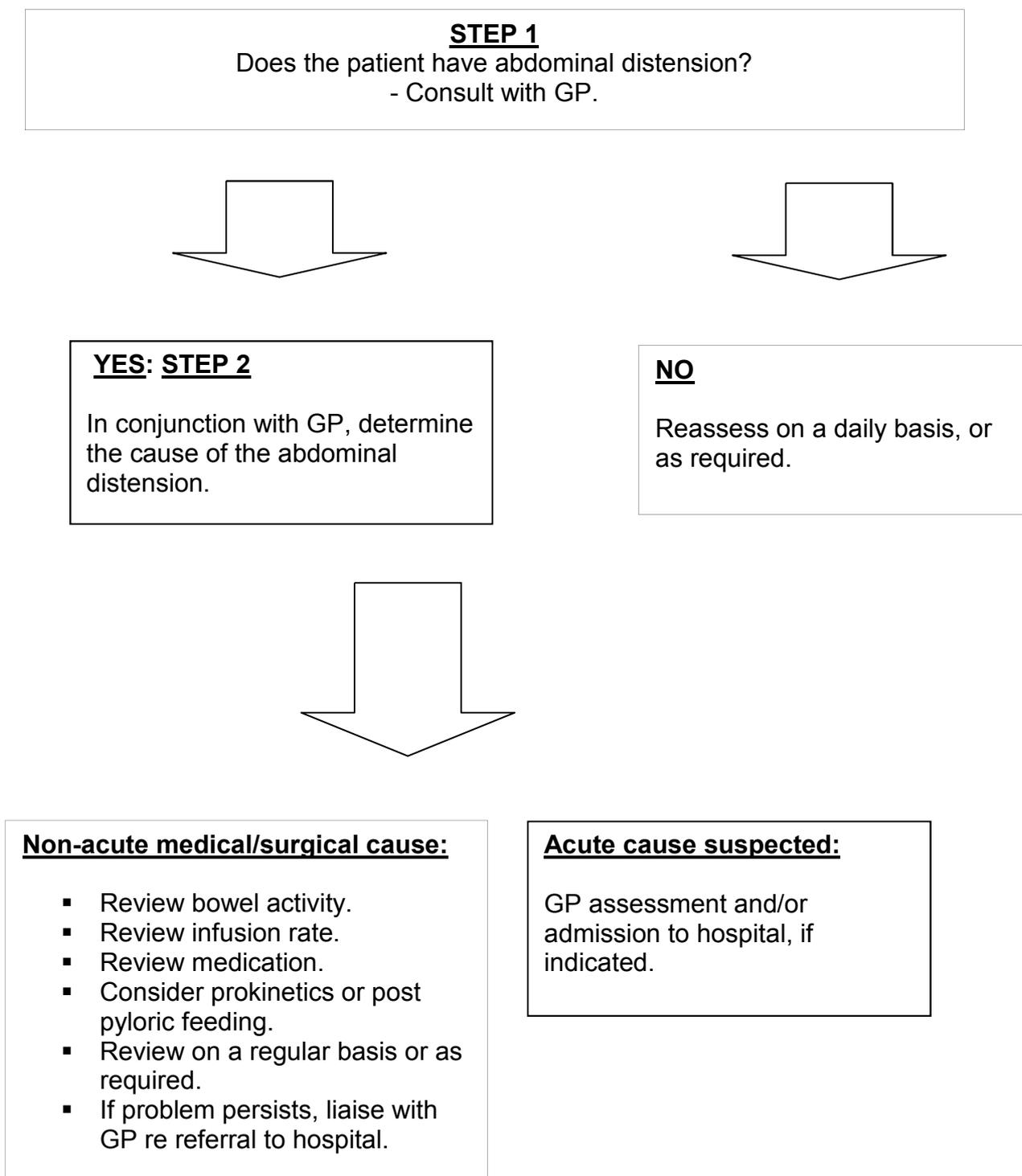
6.5 Possible medical causes

- The five f's: fat, flatus, foetus, fluid, faeces.
- Common disorders include:
Cancer, trauma, bladder distension, cirrhosis, acute gastric dilation, heart failure, IBS, large bowel obstruction, acute mesenteric artery occlusion, nephrotic syndrome, ovarian cyst, paralytic ileus, peritonitis, small bowel obstruction, acute toxic mega colon.
- Enteral feed-related: large boluses or high feed infusion rates.

6.6 Suggested solutions

- Determine the cause of abdominal distension in conjunction with the GP and the dietitian (where available).
- For enteral feeding-related causes:
 - Reduce feed rate temporarily, and consider hydration status.
 - Review feed type if no improvement.
 - Consider anti-emetics or pro-kinetics or post pyloric feeding.

6.7 Flowchart: Management of Abdominal Distension in Patients on Enteral Tube Feeding



References:

1. Oxford Handbook of Clinical Medicine, 2nd edition, 1989, Oxford University Press.
2. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.
3. Enteral Feeding Policy, Brent, Westminster, Kensington and Chelsea Trusts, NHS, 2005.

7. COMPLICATIONS: CONSTIPATION

7.1 Aims

To provide practical information on the occurrence and management of constipation in enteral tube fed patients.

7.2 Objectives

To outline causes and symptoms of constipation in tube fed patients.

To outline suggested solutions and management plan for patients with constipation.

7.3 Definition

The passage of small amounts of hard dry stool, fewer than three times per week, or a significant change in the patient's usual bowel routine accompanied by straining, bloating, or abdominal distension.

7.4 Symptoms

Bloating, pain, discomfort on defecation, feeling of incomplete evacuation, abnormal straining, vomiting, soiling, haemorrhoids, or anal fissure. Severe constipation may present with overflow diarrhoea and / or faecal incontinence.

7.5 Suggested solutions

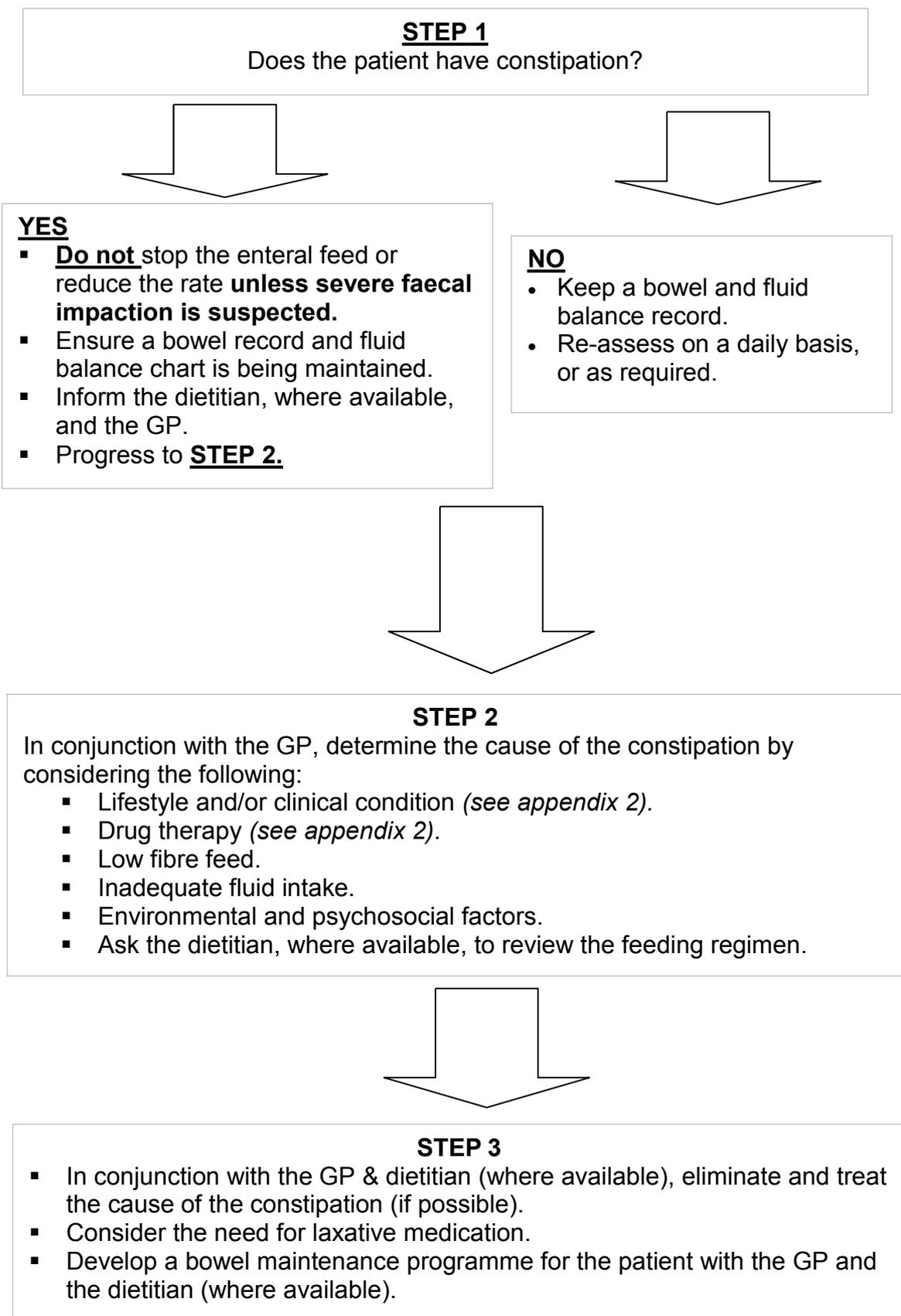
- i. Consider conditions (lifestyle & clinical) that predispose to constipation – investigate and manage as appropriate in conjunction with the patient's GP (see *appendix 2*).
- ii. Review medication (including over-the-counter drugs), and discuss with the patient's GP the possibility of stopping or reducing any causative drugs (see *appendix 2*).
- iii. Maintain accurate enteral feed and fluid balance charts and ask the dietitian, where available, to review the patient. He/she may consider commencing a fibre containing feed and/or increasing the patient's daily prescribed water flushes via the enteral tube.
- iv. Determine if environmental and psychological factors (eg. stress, anxiety, lack of privacy when toileting) are causing or exacerbating patient's constipation and eliminate or reduce if possible.
- v. If necessary and considered appropriate, commence laxative medication in conjunction with the patient's GP.
- vi. After acute constipation has resolved, develop a bowel maintenance programme for the patient with the GP and the dietitian, where available.

Only stop the enteral feed if severe faecal impaction is suspected.

References:

1. Practice Guideline for the management of Constipation in Adults. Rehabilitation Nursing Foundation (U.S.A) 2002.
2. Management of constipation in patients on enteral tube feeding .Enteral and Parenteral Nutrition Support Committee, Midland Regional Hospital at Tullamore, October 2007. GL No: RNDS 002.

7.6 Flowchart: Management of Constipation in Patients on Enteral Tube Feeding



8. COMPLICATIONS: DIARRHOEA

8.1 Aims

To provide practical information on management of diarrhoea in tube fed patients.

8.2 Objectives

To outline suggested solutions for patients with diarrhoea.

8.3 Definition

An increase in the volume, wateriness and frequency of bowel motions, with patients having the abnormal passage of three or more liquid stools per day, and/or a daily stool weight of >200g per day.

8.4 Possible Causes

Cause	Action – Prevention	Rationale
Medication (see appendix 3)	<ul style="list-style-type: none"> ✓ Review patient's medication with GP. ✓ Where possible, change, adjust or discontinue medications causing diarrhoea. 	To check for medications predisposing to diarrhoea.
Clinical Condition (see appendix 3)	<ul style="list-style-type: none"> ✓ Review patient's clinical condition with GP. ✓ Treat clinical condition as appropriate. 	To check for clinical conditions predisposing to diarrhoea.
Infection (see appendix 3)	<ul style="list-style-type: none"> ✓ Send stool sample for culture and sensitivity analysis. 	To determine cause of infection.
Overflow diarrhoea due to severe faecal impaction	<ul style="list-style-type: none"> ✓ Stop the enteral feed. ✓ Consider hydration ✓ Contact the GP. ✓ Contact the dietitian, where available. 	<ul style="list-style-type: none"> -Continuing to feed may cause vomiting, increasing aspiration risk. -To ensure adequate hydration while awaiting review by GP +/- dietitian. -To review patient's clinical condition and prescribe laxatives. -To consider alterations in feed or feed rate.

Enteral Feed	<ul style="list-style-type: none"> ✓ Discard current enteral feed and giving set. ✓ Set up a new system using good hygiene practice. ✓ Ask the dietitian (where available) to review. 	<p>-To out-rule feed contamination as cause.</p> <p>-To consider alterations in feed or feeding rate.</p>
---------------------	--	---

8.5 Suggested Solutions:

- Continue or commence recording an accurate bowel chart and fluid balance chart.
- Obtain a stool specimen and send for culture and sensitivity analysis to check for infective causes of diarrhoea.
- Commence barrier nursing/strict hygiene practices until infection as a cause is ruled out.
- To eliminate feed contamination as the cause, discard current feeding container and giving set. Using good hygiene practice, set up a new feeding system.
- Ask the GP to review the patient and treat appropriately. In conjunction with the GP, try to determine the cause of diarrhoea using the table below, and treat or eliminate the cause.
- Ask the dietitian (where available), to review the patient's feeding regimen.
- Ask the GP and dietitian to consider the need for additional fluids and electrolytes to replace those lost through diarrhoea.
- Consider commencing an anti-diarrhoeal agent provided the cause is not infective.

Do not stop the enteral feed or reduce feeding rate before determining the cause of the diarrhoea.

References:

1. Enteral Feeding Policy, Brent, Westminster, Kensington & Chelsea Trusts, NHS, 2005
2. Meyler's Side Effects of Drugs, Ed.M Dukes, J Aronse, 14th edition, Elsevier Press, 2000.
3. Management of Diarrhoea in patients on Enteral Tube Feeding, Enteral & Parenteral Nutritional Support Committee, Midland Regional Hospital at Tullamore, 2004.
4. Thomas et al. Guidelines for the Investigation of Chronic Diarrhoea. GUT 2003;52:1-15.

9. COMPLICATIONS: ASPIRATION

9.1 Aims

To provide practical information on management of aspiration in tube fed patients.

9.2 Objectives

To outline causes, symptoms and suggested management plan for tube fed patients with aspiration.

9.3 Definition:

Aspiration is the entrance of any material, including feed, into the airway.

9.4 Symptoms:

- Persistent cough, especially after food/fluid.
- Repeated chest infections.

9.5 Possible causes:

- Swallowing difficulties (dysphagia) with oral intake.
- Feeding tube displacement.
- Incorrect positioning of patient while feeding.
- Delayed gastric emptying.

9.6 Suggested solutions:

Stop enteral tube feeding if aspiration persists. Follow steps below:

- Stop all oral intake and refer patient to a speech and language therapist (where available) for assessment.
- Check that the feeding tube is not displaced.
- Ensure the feed is running at the appropriate rate.
- Ask the public health nurse to check that the feeding tube is not displaced.
- Ensure the patient's head and shoulders are raised to an angle of at least 30 degrees during feeding and for at least 60 minutes after feeding. Consider holding overnight feeding, where this is possible. Daytime feeds will need to be adjusted to provide adequate nutrients, if feeds are withheld overnight.
- Observe patient for signs of abdominal discomfort or distension.
- Contact the dietitian (where available), to review feeds and feeding rate, continuous feeding may be preferable to bolus feeds if appropriate.
- Contact the doctor to monitor symptoms and to consider prescribing gut motility agents if appropriate.
- If the problem persists, it may be necessary to consider feeding beyond the stomach. Referral to a hospital may be needed to establish feeding access beyond the stomach.

References:

1. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.
2. Dictionary of Medical Terms. Mikel Roothenberg MD & Charles Chapman eds. Barron Educational Series, Inc. 2000.
3. Enteral Feeding Policy, Brent, Westminster, Kensington and Chelsea Trusts, NHS, 2005.

10. COMPLICATIONS: GASTRO-OESOPHAGEAL REFLUX

10.1 Aims

To provide practical information on management of reflux in tube fed patients.

10.2 Objectives

To outline causes, symptoms and suggested management plan for tube fed patients with reflux.

10.3 Definition

Gastro-oesophageal reflux involves the backflow of stomach contents into the oesophagus.

10.4 Symptoms

- Burning pain in the oesophagus, otherwise known as heartburn.
- A small amount of feed may be regurgitated.

10.5 Possible causes

- Incorrect patient position during feeding times.
- Too high a feed rate for a given patient.
- Misplaced or dislodged feeding tube.
- Delayed gastric emptying.

10.6 Suggested solutions

- Elevate the patient's head and shoulders by at least 30 degrees during feeding and for at least 60 minutes after feeding.
- Check patient is following feed rate as per feeding regimen. Contact the dietitian (where available), to review feeding regimen and feed rate. Consider holding overnight feeding, if appropriate. If holding feeds overnight, daytime feeds will need to be altered to ensure adequate nutrient provision.
- Contact the public health nurse to check feeding tube position.
- Check feeding tube position.
- Consider anti-emetic medication.

References:

1. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.
2. Dictionary of Medical Terms. Mikel Roothenberg MD and Charles Chapman, eds. Barron Educational Series, Inc. 2000.
3. Enteral Feeding Policy, Brent, Westminster, Kensington and Chelsea Trusts, NHS, 2005.

11. COMPLICATIONS: NAUSEA AND VOMITING

11.1 Aim

To provide practical information on management of nausea and vomiting in tube fed patients.

11.2 Objectives

To outline possible causes of nausea and vomiting in tube fed patients.
To provide management guidelines for tube fed patients who are experiencing nausea and vomiting.

11.3 Definition

Nausea: the patient feels that they are going to vomit.

Vomiting: the action of ejecting stomach contents through the mouth.

11.4 Possible causes

- Medical cause.
- Feeding position of the patient.
- Medication side effect.
- Constipation.
- Delayed gastric emptying.
- Intestinal obstruction.
- Feed formula intolerance (rare) or rapid feed rate.

11.5 Management guidelines

STEP 1 NAUSEA/VOMITING BUT NO ABDOMINAL DISTENSION

Check for possible causes of nausea/vomiting as above.

Follow steps below. Stop feed if the patient is vomiting.

- i. Refer patient to the GP to rule out medical cause
- ii. Check patient is in correct feeding position. The patient's head and shoulders should be elevated by at least 30 degrees during feeding and for at least 60 minutes after feeding.
- iii. If patient is not tolerating feed or feed rate contact dietitian, where available, to review patient's feeding regimen.
- iv. Patient may have nausea/vomiting due to side effects of medication. Refer to doctor to review medication and consider alternative treatment.
- v. If the patient is constipated, follow instructions for dealing with constipation.

STEP 2 NAUSEA/VOMITING AND ABDOMINAL DISTENSION.

Follow action points I-V. If nausea/vomiting persists and the patient has abdominal distension follow points VI-VII.

- vi. Observe for signs of abdominal discomfort or distension. Refer the patient to the doctor for monitoring of symptoms and consideration of gut motility drugs.

- If problem persists it may be necessary to feed beyond the stomach. The doctor may need to refer the patient to hospital for assessment.
- vii. If abdominal distension persists the patient may have an intestinal obstruction. Refer the patient to the doctor for urgent assessment.

References:

1. Guidelines for the management of enteral tube feeding in adults. Clinical Resource and Efficiency Support Team (CREST) 2004.
2. Dictionary of Medical Terms. Mikel Roothenberg MD and Charles Chapman, eds. Barron Educational Series, Inc. 2000.
3. Enteral Feeding Policy, Brent, Westminster, Kensington and Chelsea Trusts, NHS, 2005.

APPENDIX 1: MEDICATION ADMINISTRATION

See local protocols/guidelines/policies - may differ wrt medication administration, associated feed breaks, etc.

DRUG	INFORMATION FOR USE VIA NG/PEG/RIG/Gastrostomy
ACYCLOVIR (Zovirax ®)	Use dispersible tablets.
AMINOPHYLLINE	Consider changing to theophylline (see advice <u>below</u>).
AMIODARONE (Cordarone®)	Crush tablet and flush down the enteral feeding tube.
AMPICILLIN	Food affects bioavailability. Change prescription to amoxicillin, which can be administered via an enteral tube without a feed break. Alternatively prescribe parenterally.
ASPIRIN	Dispersible aspirin available.
ASPIRIN + DIPYRIDAMOLE ASANANTAN RETARD ®	Give dipyridamole as liquid 100mg qds. Consider giving aspirin 75mg as substitute for aspirin 50mg in asasantin retard.
BACLOFEN (LIORESAL ®)	Lioresal liquid 5mg/5ml.
BISOCODYL (Dulco-lax)	Use suppositories or alternatively senna tablets; do not crush tablets as they are sugar coated.
BISPHOSPHONATES e.g Alendronic (Fosamax ®) Risedronate (Actonel ®)	Patient should be able to sit upright for thirty minutes after administration as may cause oesophageal ulceration. If administering via an enteral tube crush tablets and stop feed for 2 hours before and 30 mins after administration.
CARBAMAZEPINE (Tegretol ®)	Use Tegretol ® liquid in an equal volume of water. Consider monitoring carbamazepine levels
CEFUROXIME (Zinnat®)	Do not use Zinnat® suspension. Disperse tablets in water immediately before using.
CHLORPHENIRAMINE	Use promethazine (Phenergan) liquid.
CHLORPROMAZINE	Use liquid.
CITALOPRAM (Cipramil ®)	Use Cipramil ® drops (40mg/ml).
CLARITHROMYCIN (Klacid ®)	Change Klacid LA® to Klacid suspension, given twice daily. Dilute dose with an equal volume of water. Flush tube with warm water after administration to prevent clogging.
CO-AMOXICLAV (Augmentin ® and Augmentin Duo®)	Augmentin dispersible tablets, given three times daily. Alternatively, Augmentin ® 125/31 (Paediatric), 125/62 (Junior) and 400/57 (Duo) suspensions can be diluted to half strength using water immediately prior to administration.
CYCLIZINE	Crush tablets
DIAZEPAM	Tablets can be crushed and flushed through the enteral feeding tube. Alternatively, consider rectal route.

DRUG	INFORMATION FOR USE VIA NG/PEG/RIG/Gastrostomy
DIGOXIN (Lanoxin ®)	Use Lanoxin ® elixir. <u>Do not dilute.</u> Monitor plasma levels of digoxin owing to different bioavailabilities of formulations. Dose may need adjustments.
DILTIAZEM	Dilzem®-SR caps may be opened and contents administered down tube <u>without</u> crushing. Tildiem® LA and Retard cannot be crushed. Tildiem 60mg tabs may be crushed and administered three times daily. Alternatively consider changing to another calcium channel blocker, or another agent.
DOMPERIDONE (Motilium ®)	Liquid (1mg/ml suspension) or suppositories (10mg, 30mg, 60mg) available
DOXAZOSIN (Cardura® Cardura XL®)	Cardura® 1mg, 2mg may be crushed. Do not crush XL tablet.
ERYTHROMYCIN	Liquid available
ESOMEPRAZOLE (Nexium®)	Nexium® tablets can be dispersed in water for administration through enteral feeding tubes. Do not crush
ETIDRONATE (Didronel®)	Dissolve and administer tablet immediately. Stop feed 2 hours before and after administration to avoid interactions with feed. Consider changing to once weekly bisphosphonate.
FERROUS SULPHATE	Use liquid iron preparation
FLUOXETINE (Prozac®)	Prozac liquid is available.
FOLIC ACID	Crush tablet.
FUROSEMIDE (FRUSEMIDE)	Crush tablet.
FUSIDIC ACID/SODIUM FUSIDATE (Fucidin®)	Use suspension but increase dose by 50%
GABAPENTIN (Neurontin®)	Can dissolve the capsule contents in a small amount of water and use immediately
GLICLAZIDE (Diamicron ® And Diamicron ®Mr)	Crush ordinary release tablets. Do not crush Diamicron® MR
HYDROCORTISONE	Crush tablets (Not Corlan Pellets) and mix with water before use
HYOSINE BUTYLBROMIDE (Buscopan®)	Give injection via feeding tube
ISOSORBIDE MONONITRATE	Use Glyceryl Trinitrate patches
LACTULOSE (Duphalac ®)	Dilute with water.
LEVODOPA	Do not crush CR preparations. Other preparations can be crushed. Alternatively can use Madopar ® Dispersible tablets Dosage adjustment may be necessary.
LEVO-THYROXINE (Eltroxin®)	Crush tablets. Monitor thyroid function tests.

DRUG	INFORMATION FOR USE VIA NG/PEG/RIG/Gastrostomy
LITHIUM	Convert to Priadel® liquid and give in two divided doses. 200mg lithium carbonate = 5ml Priadel (lithium citrate) liquid. Dilution is not recommended. <u>NB – Always monitor plasma levels</u> as changing preparations may affect levels and toxicity can easily occur.
LOPERAMIDE (Immodium®)	Immodium® syrup 0.2mg/ml
MEGESTROL ACETATE (Megace®)	Use suspension
METOCLOPRAMIDE (Maxolon®)	Liquid preparation available Maxolon® syrup 1mg/ml
METRONIDAZOLE (Flagyl®)	Tablets should be dispersed in water. Do not use Flagyl S suspension as it may interact with feeds.
MISOPROSTOL (in Arthrotec® preparations)	Dangerous to crush tablet
MORPHINE (MST)	Continuous release morphine sachets (MST Sachets 20mg or 30mg) can be diluted with 10ml water and flushed down tube. Do not crush MST tablets
MORPHINE (Sevredol®)	Use Oramorph® liquid
NIFEDIPINE (Adalat®, Adalat La®, Adalat Retard®)	Nifedipine (in capsule or SR form) degrades in less than a minute when exposed to light. Sustained release products should not be crushed. Change to long acting calcium antagonist e.g. amlodipine if clinically appropriate.
NIMODIPINE (Nimotop®)	Crush tablets.
OLANZAPINE (Zyprexa®)	Orodispersible tablet (Velotab®) may be placed under the tongue and allowed to dissolve, if appropriate, otherwise consider alternative agent
OMEPRAZOLE (Losec®)	Losec® MUPS can be dispersed in water. Do not use in fine bore jejunostomy tubes as it will block the tube.
ONDANSETRON (Zofran®)	Syrup available.
OXYBUTININ (Cystrin®, Ditropan®)	Use Ditropan® elixir which contains oxybutynin hydrochloride 2.5mg/5ml.
PANTOPRAZOLE (Protium®)	Do not crush. Use esomeprazole (Nexium®) or lansoprazole (Zoton®)
PARACETAMOL	Use sachets, liquid or suppositories
PAROXETINE (Seroxat®)	Seroxat® liquid available
PHENYTOIN (Epanutin®)	Convert to oral suspension if available. 90mg of suspension is approximately equivalent to 100mg of capsules. Feeds should be stopped for 1-2 hours before and 1-2 hours after administration.
POTASSIUM CHLORIDE (Slow K)	Use Sando K® effervescent tablets or KayCeeL® Syrup
PREDNISOLONE	Use Soluble tablets (Prednesol®)

DRUG	INFORMATION FOR USE VIA NG/PEG/RIG/Gastrostomy
PROCHLORPERAZINE (Stemetil®)	Stemetil® tablets can be crushed. Alternatively can use suppositories, buccal preparation or injection.
PROPANOL	If on Inderal-LA® preparation change to non-sustained release propranolol preparation which can be crushed and give two-three times daily
RABEPRAZOLE (Pariet®)	Change to esomeprazole (Nexium®), or lansoprazole (Zoton®).
RANITIDINE (Zantac®)	Use effervescent tablets.
SALBUTOMOL	Give by inhalation if possible. Liquid is available
SENNA (Senokot®)	Senokot® syrup 7.5mg/5ml is available
SODIUM VALPROATE (Epilim®)	Epilim® liquid 200mg/5ml is available. Epilim® crushable 100mg tablets can be crushed also. Do not crush enteric coated tablets or CR tablets
SOTALOL	Tablets can be crushed but use immediately.
TEMAZEPAM	Crush tablets.
THEOPHYLLINE	Slo-phyllin capsules may be opened and the contents added to the feeding tube without crushing. Theophylline formulations are not interchangeable. Dose adjustment and plasma level monitoring may be necessary.
VENLAFAXINE (Efexor®, EfexorXL®)	Do not crush XL caps, convert to tablets, which can be crushed and given twice daily.
WARFARIN	Adjust warfarin dose in response to INR may vary depending on the Vitamin K content of feed.

ANTIBIOTICS

Practices regarding the stopping of enteral tube feeds before and/or after enteral administration of antibiotics (and other drugs) vary. Check local policies and protocols. Antibiotics which ideally require interruptions in tube feeding include:

- Ampicillin.
- Flucloxacillin.
- Isoniazid.
- Penicillin V (Calvopen®) phenoxymethylpenicillin.
- Quinalone antibiotics: eg Levofloxacin, Ofloxacin, Ciprofloxacin.
- Rifampicin.
- Tetracycline.

APPENDIX 2: CONSTIPATION

Lifestyle & Clinical Conditions predisposing to constipation

(Please note this list is not an exhaustive list)

Lifestyle	<p>Immobility Lack of Exercise Ignoring the urge to defecate Stress Toileting Patterns Abnormal toileting position Inconsistent and insufficient toileting time Inadequate toileting facilities Lack of privacy Laxative abuse Alcohol abuse</p>
Clinical Conditions	
Neurological Disorders	<p>Multiple Sclerosis Parkinsons Disease Chronic Idiopathic Intestinal pseudo-obstruction Stroke Spinal Cord Injuries Motor Neuron Disease Hirschsprung Disease Chagas Disease Familial Dysautonomia Cerebral Palsy Spina Bifida</p>
Metabolic & Endocrine Conditions	<p>Diabetic gastroparesis Hyperthyroidism Hypothyroidism Uraemia Hypercalcaemia Hypokalaemia</p>
Systemic Disorders	<p>Amyloidosis Lupus Scleroderma</p>
Bowel Disorders	<p>Diverticulosis Bowel & uterine tumours Colorectal Stricture Irritable bowel syndrome Haemorrhoids</p>
Miscellaneous	<p>Pregnancy Idiopathic Depression</p>

APPENDIX 2 continued

Medication predisposing to constipation

Analgesics (narcotics)
Antiemetics
Medications used for Parkinsons Disease
Antacids with aluminium and calcium
Anticonvulsants
Antihistamines
Antidepressants
Anticholinergics
Aspirin
Calcium channel blockers
Diuretics (potassium wasting)
Iron supplements
Muscle relaxants
Nonsteroidal anti-inflammatory drugs
Psychotherapeutic
Vinca alkaloids
Abuse of laxatives

APPENDIX 3: DIARRHOEA

Medications with diarrhoea as a side effect:

(please note this is not an exhaustive list)

- Antibiotics.
- Sorbitol-containing oral liquid preparations.
- Magnesium-containing drugs.
- Laxatives.
- Miscellaneous medications.

Table 1: Antibiotics

Most antibiotics (particularly broad-spectrum antibiotics) can cause diarrhoea.

Amoxicillin (including Augmentin® preparations)
Ampicillin
Ciprofloxacin (Ciproxin®/Truoxin®)
Clindamycin (Dalacin-C®)
Erythromycin (Erythrocin®)
Fusidic Acid (Fucidin®)
Naladixic Acid (Negram®)
Nitrofurantoin (Furadantin®/Macrochantin®/Macrobid®)
Penicillin derivatives
Rifampicin
Teicoplanin
Vancomycin

(Note: that the effect is more pronounced when the drug is given orally, but may occur even with parenteral administration of the drug)

APPENDIX 3 continued

Table 2: Sorbitol-containing oral liquid preparations

<u>Drug</u>	<u>Preparation:</u>
Aciclovir	Zovirax Suspension
Baclofen	Lioresal liquid
Bromhexine hydrochloride	Bisolvon elixir
Carbamazepine	Tegretol liquid
Chlorhexidine gluconate	Corsodyl mouthwash
Codeine	Codinex linctus
Dantron	Codalax suspension
Desloratidine	Neoclarityn syrup
Dextromethorphan hydrobromide	Robitussin junior syrup
Domperidone	Motilium suspension
Erythromycin	Erythroped 250 mg.
Frusemide	Lasix paediatric liquid
Magnesium hydroxide	Maalox suspension
Nalidixic acid	Negram
Ondansetron	Zofran syrup
Orciprenaline sulphate	Alupent syrup
Orciprenaline sulphate	Alupent expectorant mixture
Paracetamol	Calpol infant suspension
Paracetamol	Paralink solution
Paracetamol	Calpol six plus suspension
Paracetamol	Calpol Fast melts
Paroxetine	Seroxat liquid
Potassium chloride	Kay-Cee-L syrup
Ranitidine hydrochloride	Zantac syrup
Sodium valproate	Epilim liquid
Sulphamethoxazole + Trimethoprim	Septrin Syrup
Trimethoprim BP	Monotrim suspension

Table 3: Magnesium-containing drugs

Laxatives	Milpar Milk of Magnesia Epsom salts
Antacids	All antacids including Maalox
Magnesium supplements	MagOx, Magnesium Verla

APPENDIX 3 continued

Table 4: Laxatives

Fletchers enema
Glycerine suppositories
Lactulose (Duphalac®, Gerelax®)
Milpar®
Milk of Magnesia®
Co-danthromer (Codalax and Codalax Forte® Caps and liquid)
Senna (Senokot® Tablets and Liquid)
Bisacodyl (Dulco-Lax® Tablets and Suppositories)
Laxoberal®
Picolax®
Klean Prep®
Fleet Phospho Soda®

Table 5: Miscellaneous medications which may cause diarrhoea

Acarbose (Glucobay®)
Antifungals (fluconazole, griseofulvin, itraconazole, ketoconazole, Nystatin, terbinafine)
Antihistamines
Anti-Ulcer Drugs (omeprazole, esomeprazole, lansoprazole)
Antivirals (some including ganciclovir, Valaciclovir,
Anti-worming agents (albendazole, ivermectin)
Beta-Blockers (e.g. atenolol, propranolol...)
Biperiden (akineton®)
Blood and Blood Products
Caffeine
Carbamazepine (Tegretol®)
Chenodeoxycholic acid (Ursofalk®)
Cisapride (Prepulsid®)
Colchicine
Cytotoxics (including methotrexate)
Iloprost (Ilomedin®)
Methyldopa (Dopamet®/Aldomet®)
Nateglinide (Starlix®)
NSAIDs (mefenamic acid)
Repaglinide (Novonorm®)
Rosiglitazone (Avandia®)
SSRIs (fluoxetine, paroxetine etc.)
Tranexamic Acid (Cyklocapron®)
Ursodeoxycholic Acid (Ursofalk®)

APPENDIX 3 continued

Table 6: Conditions associated with diarrhoea

Clinical Condition	Examples
Malabsorption	Lactose intolerance Coeliac disease or gluten malabsorption Cystic fibrosis Disaccharide malabsorption Cows milk protein intolerance
Inflammatory bowel disease	Crohn's disease Ulcerative colitis
Immune deficiency	Severe combined immunodeficiency Hypogammaglobulinaemia Panhypogammaglobulinaemia (Bruton) Chronic granulomatous disease IgA deficiency
Surgical procedures	Bowel surgery Gastrectomy
Partial bowel bockage	Cancer/lymphoma Colonic polyps Diverticulitis
Other	Zollinger-Ellison syndrome Autonomic neuropathy (diabetes neuropathy) Tuberculosis of the large intestine Hyperthyroidism Irritable bowel syndrome Stress Pancreatic tumours Medullary carcinoma of the thyroid Toxic megacolon

APPENDIX 3 continued

Table 7: Infections associated with diarrhoea

Infections associated with diarrhoea	Examples
Bacterial infection	Campylobacter species Salmonella species Yersinia species Shigella species E. coli species Vibrio species Clostridium difficile species Aeromonas species Plesiomonas species Staphylococcus aureus
Viral infection	Rotavirus Cytomegalovirus Adenovirus Echovirus HIV virus Norwalk virus Coronaviruses Astroviruses
Parasitic infection	Giardia lamblia Cryptosporidium parvum Cyclospora Entamoeba histolytica
Toxic	Often referred to as “food poisoning”. The most common toxin is an endotoxin produced by a staphylococcus species.
Other	Dysentery Roundworm (Ascariasis) Tapeworm (Cestodiasis) Typhoid fever

APPENDIX 4: GASTROSTOMY FEEDING TUBES

Table 1: Corpak Medsystems Gastrostomy tubes

Tube Type	CORFLO PEG	CORFLO Gastrostomy	CORFLO cuBBY button gastrostomy	CORFLO over-the-wire push PEG
Material	Polyurethane	Silicone	Silicone	Polyurethane
Size	12Fr-90120055 16Fr-90120057 20Fr-90120056	12Fr-90120030 14Fr-90120032 16Fr-90120033 18Fr-90120034 20Fr-90120031 (20ml) 16Fr-90350016 (20ml)	12Fr-1.0, 1.5, 2.0, 2.5 3.0, 3.5cm; 14Fr, 16Fr, 18Fr, 20Fr, 24Fr, -1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5cm	20Fr-90120080
Placement procedure	Pull	Into established tract or primary placement surgically or radiologically	Into established tract or primary placement surgically or radiologically	Push Primary placement radiologically
Internal Bumper	Collapsing polyurethane foam balloon	Balloon 5ml 12-18Fr 20ml-20Fr +16Fr-90350016	Gastrosil balloon 5ml	Collapsing polyurethane foam bumper
External Bumper	Right angled fixation device or bumper bar	Retention bolster with vent holes	3 feet	
Lifespan	18 months – 3 years	Up to six months	6 months (balloon guaranteed for 3 months)	
Procedure for removal	Traction	Traction (deflate balloon)	Traction (deflate balloon)	Traction

Tube Type	CORFLO PEG	CORFLO Gastrostomy	CORFLO cuBBY button gastrostomy	CORFLO over-the-wire push PEG
Markings	Brand, Fr. Size, Centimetre markings	Brand, Fr. Size, Centimetre markings Colour coded balloon inflation valve 12Fr White 14Fr Green 16Fr Orange 18Fr Red 20Fr Yellow	Brand, Fr. Size, and shaft length Recessed inflation valve.	
External connectors	Y-adaptor feeding connector combining a luer lock with a dual bolus port. Universal fitting	Female end compatible with male ended giving sets	Female end compatible with luer tipped syringe	
Additional connectors / equipment	Jejunal extension tubes available 6Fr (90120062) compatible with 16Fr PEG, 8Fr (90120060) +10Fr-90120063 compatible with 20Fr PEG	Y extension set 0901 200 37 Universal fitting	Stoma measuring device 90120241	
Replacement connectors	Corlock-Corport Y-adaptor repair kit 12Fr-90120054 16Fr-90120058 20Fr-90120051	New Y extension set 090120037 required every 2 – 3 weeks	CORFLO –cuBBY Right Angle Feeding Set 24” 90120343 12” 90120344 3” 90120345 OR Bolus Feeding Set 12” 090120342 required every 2 – 3 weeks	
Written information	Information booklets for	Information booklets for	Information booklets for	

on placement and care	patients and carers, dvds. Information sheets	patients and carers, dvds. Information sheets	patients and carers, dvds. Information sheets	
Back up from company	086 – 804 5805			

APPENDIX 4 continued

Table 2: FREKA Gastrostomy tubes

Tube Type	FREKA PEG	Button Gastrostomy	Gastrotube
Order number	9Fr 7901051 15Fr 7901111 20Fr 7751531	1.1 7751241 1.4 7751251 1.7 7751261 2.0 7751271 2.5 7751281 3.0 7751291 3.5 7751301 4.0 7751311 4.5 7751321	7750821
Material	Polyurethane	Latex free silicone	Latex free silicone
Size	9Fr 15Fr 20Fr	15Fr 9 shaft lengths 1.0-4.5cm	15Fr
Placement Procedure	Endoscopic Pull	Into established stoma (no sooner than 4 weeks after initial PEG)	Primary surgical placement or as replacement into existing stoma
Internal Bumper	Disc retention plate	Water balloon (5-7.5ml volume)	Water balloon
External Bumper	Triangular silicone fixation plate – colour + size coded	Nil	Clear triangular silicone fixation plate
Lifespan	Should be reviewed after 12 months	Several months (reduced with frequent administration of alcoholic drinks and aggressive drugs)	18 months on average. Re-enforced balloon channel – only check volume every 6 weeks
Procedure for removal	Endoscopic Should not be cut to pass PR	Traction (empty balloon)	Traction (empty balloon)
Markings	French size: 9Fr Yellow 15Fr Blue 20Fr Purple Centimetre markings	French size and shaft length Integral anti-reflux valve	French size Centimetre markings Clamp on tube shaft
External connectors	Male luer lock connector		Female funnel adaptor
Additional connectors/ equipment	Funnel adaptor 7981971. Clamp (see	RIGHT angled adaptor 7750801 Button extension	Nil

	list) 9Fr jejunal extension via 15Fr PEG	set 798193W (for bolus feeding)	
Replacement connectors	Luer lock connector 7981311 - 9Fr 798137y - 15Fr 7751651 - 20Fr	Stoma measuring device 7750921	Nil
Tube Type	FREKA PEG	Button Gastrostomy	Gastrotube
Written information on placement and care	Yes Information booklets for patients and carers	Yes	Pending
Back up from company	0860306669 Sheila Boyling (Country wide) 0876375675 Clare Fingleton (Leinster) 0873117722 Sue Aneiros (Munster/Connaught) 0868389812 Seamus Mc Auley (Northern Ireland / NW and Connaught)		

APPENDIX 4 continued

Table 3: Kimberly-Clark Gastrostomy feeding tubes

Tube	MIC PULL PEG	MIC PUSH PEG	MIC Gastrostomy G-Tube	MIC Bolus Gastrostomy Feeding Tube	MIC-KEY G Low Profile Feeding Tube
Material	Silicone	Silicone	Silicone	Silicone	Silicone
Size	14Fr, 20Fr, 24Fr	14Fr, 20Fr, 24Fr	12Fr, 14Fr, 16Fr, 18Fr, 20Fr, 22Fr, 24Fr, 26Fr, 28Fr, 30Fr	12Fr, 14Fr, 16Fr, 18Fr, 20Fr, 22Fr, 24Fr	12Fr, 14Fr, 16Fr, 18Fr, 20Fr, 24Fr 0.8cm-4.5cm shaft length
Placement Procedure	Pull	Push (over-the-wire)	Primary placement radiologically or into existing tract	Primary placement radiologically or into existing tract	Primary placement radiologically or into existing tract
Internal Bumper	Collapsible internal retention Dome	Collapsible internal retention Dome	Silicone internal retention balloon (water)	Silicone internal retention balloon (water)	Silicone internal retention balloon (water)
External Bumper	SECUR-LOK External Retention Ring	SECUR-LOK External Retention Ring	SECUR-LOK External Retention Ring	SECUR-LOK External Retention Ring	None required
Lifespan	Indefinite	Indefinite	1-12 months	1-12 months	1-12 months
Procedure for removal	Endoscopically or Traction	Endoscopically or Traction	Traction (deflate Balloon)	Traction (deflate Balloon)	Traction (deflate Balloon)
Markings	Centimetre markings	Centimetre markings	Centimetre markings French size Balloon volume	Centimetre markings Fr Size	French size Shaft length Balloon valve Lot number
External connectors	Universal Feeding adaptor with medication port	Universal Feeding adaptor with medication port	Universal Feeding adaptor with medication port	Balloon port, female ended feed port	6 types of extension sets depending on syringes used

Tube	MIC PULL PEG	MIC PUSH PEG	MIC Gastrostomy G-Tube	MIC Bolus Gastrostomy Feeding Tube	MIC-KEY G Low Profile Feeding Tube
Additional connectors /equipment	Bolus adaptor Feed Port adaptor Luer-locking	Bolus adaptor Feed Port adaptor Luer-locking	6", 12" extension tubing graduated adaptor extension sets with clamp 105-12 106-12	6", 12" extension tubing graduated adaptor extension sets with clamp 105-12 106-12	MIC-KEY Stoma measuring Device 6 types of MIC-KEY extension set
Replacement connectors	Universal Feeding Adaptor: 14Fr MIC 135-14; 20Fr MIC 135-20; 24Fr MIC 135-24 Bolus Feeding Adaptor: 14Fr MIC 135-14; 20Fr MIC 135-20; 24Fr MIC 135-24 Feeding Port Adaptor Luer Locking: 14Fr MIC 137.14 20Fr MIC 137.20 24Fr MIC 137.24	Universal Feeding Adaptor: 14Fr MIC 135-14; 20Fr MIC 135-20; 24Fr MIC 135-24 Bolus Feeding Adaptor: 14Fr MIC 135-14; 20Fr MIC 135-20; 24Fr MIC 135-24 Feeding Port Adaptor Luer Locking: 14Fr MIC 137.14 20Fr MIC 137.20 24Fr MIC 137.24	6", 12" extension tubing graduated adaptor extension sets with clamp	6", 12" extension tubing graduated adaptor extension sets with clamp	12" + 24" MIC-KEY Extension set with SECUR-LOK right angle connector Medication Set Bolus Extension Set 0121-12 Mic key 12" Y port adaptor non NPSA 0126-12 Mic Key 12" single ext. set with male luer. No cap 0321-12 Mic Key 12" Y extension set NPSA compliant
Written information on placement and care	Yes	Yes	Yes	Yes	Yes
Back up from company	0860306669 Sheila Boyling (Country wide) 0876375675 Clare Fingleton (Leinster) 0873117722 Sue Aneiros (Munster/Connaught) 0868389812 Seamus Mc Auley (Northern Ireland / NW and Connaught)				

APPENDIX 4 continued

Table 4: Healthcare21 Gastrostomy feeding tubes

Tube	PEG Entristar	Skin level Gastrostomy	Nutriport Skin level Balloon Gastrostomy
Material	Biocompatible Polyurethane	Biocompatible Polyurethane	Silicone
Size	16Fr 20Fr	12Fr: 1.2; 1.5; 2; 2.5; 3; 3.5; 4; 4.5; 5 16Fr: 1.5; 1.7; 2; 2.4; 2.7; 3; 3.5 20Fr: 1.5; 2; 2.5; 3; 3.5; 4; 4.5;5	12, 14, 16, 18, 20, 24Fr and 0.8-5.0cm shaft lengths
Placement Procedure	Single pass	Gripstar insertion/removal device + obturator	Single pass One handed stoma measuring device
Internal Bumper	Star shaped bolster	Star shaped bolster	Balloon
External Bumper	Retention disc	Retention disc (inverted)	Retention Disc (inverted)
Lifespan	Long term Documented life of 6.2 years	18 months +	Company reports tubes have lasted for up to 9 months in a trial
Procedure for removal	Obturator removal system without traction or endoscope	Gripstar and obturator removal device	Deflate balloon
Markings	Product name and graduated markings	Stoma measuring device has product name and graduated markings	Stoma measuring device has product name and graduated markings
External connectors	Set includes female/male dual port connectors	Set includes both a continuous and bolus feeding set	Set includes both a continuous and bolus feeding set
Additional connectors/ equipment	20Fr compatible with 9Fr Jejunal tube All accessories available separately	Gripstar and Obturator Sterile continuous and bolus feeding sets Non-sterile continuous and bolus feeding sets	Proximal anti-reflux valve One handed stoma measuring device Enteral security clip as locking system
Replacement connectors	16/20Fr male dual connectors		16/20Fr male dual connectors

Written information on placement and care	Patient manual Video	Patient manual Patient video Physicians video	Patient manual Video
Back up from company	Healthcare21 01 7749751 24hr Enteral Helpline Service 021 4521917		

APPENDIX 4 continued

Table 5: Cook Gastrostomy feeding tubes (Cook Medical Devices)

Tube	Cook Medical PEG 24	Cook Medical Flow 20	Cook Medical Replacement Balloon G Tube	Wils Oglesby Gastrostomy
Material	Silicone	Silicone		Radiopaque polyurethane Connecting tube is PVC
Size	24Fr	18.6Fr (flow rate is equivalent to 20Fr)	14Fr 5cc balloon 14 BRT; 18Fr 20cc balloon 18 BRT; 24Fr 20cc balloon 24 BRT	12Fr
Placement procedure	Push/pull	Push/pull		Radiological insertion requiring Gastrointestinal Suture Anchors to secure gastric wall to abdominal wall. Sutures remain in for 5-7 days depending on local policy
Internal Bumper	Tulip tip radiopaque	Tulip tip	Collapsible conical tip	Pig tail loop with draw string
External Bumper	Pivotal external bolster twist lock	Pivotal external bolster twist lock	Pivotal external bolster twist lock	Temporary white fixator generally used for sutures
Lifespan				
Procedure for removal	Traction	Traction		Cut to release tension on the draw string which holds the pigtail loop and pull
Markings	Name size and	Name size and	Graduated markings, name	Size note on the red connector

	graduated markings	graduated markings	and balloon access valve colour coded	
Tube	Cook Medical PEG 24	Cook Medical Flow 20	Cook Medical Replacement Balloon G Tube	Wils Oglesby Gastrostomy
External connectors	Female end compatible with male ended giving sets Code UFA-24- Universal feeding adaptors (box of 5)	Female end compatible with male ended giving sets	Female end compatible with male ended giving sets	Female end compatible with male ended giving sets One way stop cock on the extension set may be attached below the red connector for a clamp
Additional connectors/ equipment	Compatible with 12Fr GJ tube	Compatible with 12 Fr Jejunal tube 'X'		Extension sets available but generally not necessary
Replacement connectors				Red connectors Code FTA-MLLA-R
Written information on placement and care			Patient care manual Instruction booklet	
Back up from company			Cook Medical +353 61239252	

APPENDIX 5: JEJUNOSTOMY FEEDING TUBES

This is not an exhaustive list of all jejunostomy tubes available

Tube	Argyle	Cook Medical Shetty Gastro-jejunostomy	Vygon Nutricath Jejunostomy Tube	Freka Surgical Jejunostomy Tube	MIC* Jejunostomy Tube
Placement procedure	Surgically placed-needle catheter jejunostomy set	Radiological placement	Surgically placed needle catheter jejunostomy set	Surgically placed	Surgically placed
Order number		G-JS 1400-SHETTY			
Material	Polyurethane	Ultrathane	Silicone	Polyurethane	Silicone
Size	8 French 80cm long	14French	9.6French	9French	9Fr
Mainly used	As primary placement for patients post oesophagectomy or if short term jejunostomy feeding required.	For patients with aspiration risk. Placed through gastrostomy site and threaded into jejunum	As primary placement for patients post upper gastrointestinal surgery.	For early post-operative long term intrajejunal nutrition after laparotomy or laparoscopy.	For jejunal feeding
Internal bumper	No bumper	Pigtail loop	No bumper. Internal purse string suture	No bumper.	Dacron cuff & 2 silicone suture wings
External bumper	White plastic circular device, sutured to the skin	None/temporary sutures for 7-10 days when a primary placement	None.	External fixation plate with securing clip (silicone)	
Lifespan	Months (no specific life span)	3-4 months (SJH local policy) Recommended not to remain in situ for > 4 months at SJH however in practice remain in for longer.	No specific lifespan	No specific lifespan	2-3 years
Procedure for removal	Remove stitches at the stoma site (if any) cut tube at end port	Cut end off the tube(at connector end) and pull	Remove stitches at stoma site, cut tube and pull – usually	Remove stitches at stoma site and pull tube - usually	Surgical removal under local anaesthetic

	and pull		performed by member of the surgical team.		
Markings	None Radioopaque line for x-ray verification	None	None	Interval markings every 5cm(radio opaque)	Radio-opaque stripe
External connectors	Blue single port fixed to tube (Often routinely changed to 9fr luer lock at ward level by CN/Staff nurse, see below)	1.Red connector (single port) CODE FTA-MLLA-R	White male luer to male luer connector (893.00)	Positive (male) leur lock adaptor CH/FR9 Order code 7981311	
Additional connectors	None available so use 9Fr Freka luer lock connector (7981311) if blue end gets damaged/falls off	1 way or 3 way stop cock may be attached ** 1 way stop cock # Code POWSC-FLL-MLL-LP	Red universal stopper (9888)		
Comments	X-ray line on it Do not rotate at site as you would a gastrostomy	Can be easily dislodged if not secured well. Do not rotate at site as you would a gastrostomy	Do not rotate.	Do not rotate.	
Company Rep	Sherwood Medical, Tullamore	Ray Keating 0876298953 Main Cook Medical phone number is 061334440	Denis Coakley 0862551148. www.vygon.com	Clare Fingleton National account manager, Medical Division, Technopath, 0876375675.	Halyard Health

** not ideal as can allow non NPSA syringes to be used. # expensive.