Percutaneous Endoscopic Gastrostomy (PEG) E-Learning package
Outline: This learning package is designed for Dietitians and Gastroenterology Medical Officers as part of the Percutaneous Endoscopic Gastrostomy (PEG) credentialing program.

Aim: To educate Dietitians in the management of PEG/gastrostomy tubes and stoma sites. This includes replacing obstructed, disintegrating or displaced balloon gastrostomy tubes.

Credentialing and competency programs
This learning package must be completed prior to commencing clinical procedures. The skill assessment component of this package must be completed before the supervised practical sessions.
Refer to Dietetics Gastrostomy Feeding Tube Credentialing Program Clinical Practice Guideline for credentialing program requirements.
Learning and assessment objectives

• Demonstrate adequate knowledge to identify different gastrostomy tubes and their insertion/removal methods

• Demonstrate skills in insertion, removal and troubleshooting of balloon gastrostomy tubes, including evidence based stoma site management

• Ensure consistent management of gastrostomy tubes at Peninsula Health, in line with current evidence based practice

Acknowledgments

• SVHM Gastroenterology, CNC Darren Gaut and the SVHM Residential In-Reach Team for e-learning package content and training

• Agency for Clinical Innovation and the Gastroenterological Nurses College of Australia, A Clinician’s Guide: Caring for people with gastrostomy tubes and devices (From pre-insertion to ongoing care and removal) Version 1.2 for e-learning package content and pictures
Introduction

A gastrostomy feeding tube or device is one which has been inserted directly through the abdominal wall into the stomach to provide access for the delivery of long-term enteral nutrition, fluids, and medications. Gastrostomy devices may be inserted via several methods, including endoscopically, radiologically and surgically.

Note this package relates only to percutaneous endoscopically inserted gastrostomy (PEG) tubes and replacement gastrostomy tubes (not surgical gastrostomy or jejunostomy/gastro-jejunal tubes).

There are three modules in this learning package:

- Gastrostomy tube identification
- Gastrostomy insertion & removal skills
- Gastrostomy care & troubleshooting
<table>
<thead>
<tr>
<th>Indications for enteral feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Neurologically impaired patients with associated dysphagia e.g. stroke, post-traumatic brain injury, motor neurone disease, multiple sclerosis, cerebral palsy</td>
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<tr>
<td>• Head and neck cancer</td>
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<tr>
<td>• Chronic upper oesophageal obstruction e.g. stricture, cancer</td>
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<tr>
<td>• Increased metabolic requirements in patients with acute or chronic diseases (e.g. heart disease, renal disease, cystic fibrosis, Inflammatory Bowel Disease, liver disease, cancer) who are unable to meet caloric requirements with oral diet alone</td>
</tr>
<tr>
<td>• Organic or non-organic growth faltering in paediatric patients and severe malnutrition where supplemental long term enteral tube feeding is required to meet nutritional requirements. Treatable causes for growth faltering need to be excluded first.</td>
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<tr>
<td>• Chronic requirements for mechanical ventilation (e.g. tracheostomy)</td>
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<tr>
<td>• Medical conditions where patients require medications on a regular basis and are unable to tolerate oral administration</td>
</tr>
<tr>
<td>• Congenital abnormalities of the GIT e.g. oesophageal atresia</td>
</tr>
<tr>
<td>• Paediatric and adult patients requiring specialised formulas for a prolonged period that the patient is unable to tolerate orally e.g. rare metabolic conditions, patients with multiple food allergies who need elemental formula.</td>
</tr>
<tr>
<td>• Disorders of gastrointestinal (GI) motility/digestion/absorption e.g. short bowel syndrome/chronic intestinal pseudo-obstruction, long segment Hirschsprungs</td>
</tr>
<tr>
<td>• Other clinical conditions such as reconstructive facial surgery or wasting in AIDS.</td>
</tr>
</tbody>
</table>

Adapted from GENCA ACI gastrostomy guide, 2014
<table>
<thead>
<tr>
<th>Contraindication</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Endoscopic insertion</strong></td>
<td></td>
</tr>
<tr>
<td>Total oesophageal obstruction</td>
<td>Risk of oesophageal perforation during PEG or inability to pass the endoscope</td>
</tr>
<tr>
<td>Obstructive head and neck tumours</td>
<td>Inability to pass endoscope</td>
</tr>
<tr>
<td><strong>All insertion methods</strong></td>
<td></td>
</tr>
<tr>
<td>Anorexia Nervosa</td>
<td>Need to address underlying psychiatric issue</td>
</tr>
<tr>
<td>Inability of patient and/or carer to comply with required care including appropriate home environment</td>
<td>Risk to health of patient</td>
</tr>
<tr>
<td>Portal hypertension (potential presence of varices)</td>
<td></td>
</tr>
<tr>
<td>Known varices</td>
<td>Risk of haemorrhage during procedure</td>
</tr>
<tr>
<td>Severe coagulopathy</td>
<td></td>
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<tr>
<td>Gastric outlet obstruction</td>
<td>Contraindication to gastric feeding</td>
</tr>
<tr>
<td>Upper gastrointestinal malignancy where surgical intervention is being considered</td>
<td>Stomach may need to be preserved for future surgical procedures. Surgical opinion should be sought prior to gastrostomy</td>
</tr>
<tr>
<td>Ascites (PEG and laparoscopic gastrostomy contraindicated)</td>
<td>Risk of poor tract formation (difficult to approximate stomach to abdominal wall)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>Risk of worsening sepsis</td>
</tr>
<tr>
<td>Advanced dementia</td>
<td>As outlined on page 18</td>
</tr>
<tr>
<td>Significant hepatomegaly (liver extends across abdomen)</td>
<td>Risk of liver laceration – requires surgical advice</td>
</tr>
<tr>
<td>Intra-abdominal mass</td>
<td>Risk of perforation</td>
</tr>
<tr>
<td>Morbid obesity (PEG and laparoscopic gastrostomy contraindicated)</td>
<td>Risk of poor tract formation (difficult to approximate stomach to abdominal wall)</td>
</tr>
</tbody>
</table>

Adapted from GENCA ACI gastrostomy guide, 2014
MODULE 1:
Gastrostomy tube identification
**Tube identification**

There are many different types of feeding tubes – **identification** of a patient’s feeding tube ensures appropriate management and safe removal/replacement.

Gastrostomy tubes are secured by an internal retention device on the inside (either a soft disk or balloon also known as a “bumper”) and an external retention device (also known as a “flange”) on the outside. There are many different types of tubes, usually classified as non-balloon or balloon depending on the internal retention device:
**Tube identification**

Balloon tubes can be identified by the balloon port on their side:

* Balloon tubes can come with or without a clamp. A clamp may be useful for clients with dexterity issues.

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**Non-balloon tube**

- Usually a patient’s first or ‘initial’ tube
- Do not require as frequent replacement, but do require sedation/coming to Endoscopy for insertion and removal
- **Not** be changed/removed in the community.
  May be changed/removed in outpatient clinic following discussion with Gastroenterologist.

**Balloon tube**

- Need to be changed more frequently due to balloon internal retention device
- Easier to replace as do not require sedation/coming to Endoscopy
- Can be managed in the community or hospital outpatient clinic
**Tube identification**

Gastrostomy tubes can also come in skin level or “low profile” designs – with and without balloons:

**Stoma length**

Low profile gastrostomy tubes have a French or Charrière size (e.g. Fr/Ch 14,18,20,24) along with a stoma tract length measurement (e.g. 1.5/2.3/3.0cm). The cm measurement of the external retention device of a standard gastrostomy tube can guide stoma length size selection of a low profile gastrostomy tube.
Tube identification
Extension tubes connect to low profile gastrostomy tubes to allow feeding.

Examples of extension tubes for low profile devices

- **Bolus extension tube**
- **Feeding port**
- **Side port**
- **Clamp**
- **Connector**
- **Extension tube with right-angled connector (different lengths are available)**

Connect extension tube to feed
**Tube identification**

Some gastrostomy tubes require an obturator for insertion and removal
- Although they can be changed at the bedside, for Peninsula Health patients they should only be removed/replaced in endoscopy due to risk of GI tract perforation or mis-insertion into the peritoneum.

Example of ‘cage’ type, non-balloon obturator gastrostomy
**Tube Identification**

A patient arrives on the ward with a tube you don’t recognise. The markings are faint, it is not functioning and needs to be replaced – what do you do?

- Ask the patient/family for details – were they given any information on insertion?
- Inspect the tube – what brand is it, is it low profile, is there a balloon port? Are there any markings? Check manufacturer product guides, websites or contact the company rep.
- Look at old operation reports, contact the Dietitian where the tube was inserted, take a photo and send to a gastrostomy expert/credentialed clinician.
- If still unsure, consider imaging/endoscopy to determine internal retention device.
Tube identification
Once you have identified the gastrostomy tube, be sure to DOCUMENT details below:

Type – Brand, balloon/non balloon, ? low profile, removal method
Size – French/Charrière size, centimetre marking of external retention device / stoma length (for low profile devices)
If known – volume of water in balloon, date and place of insertion

Nutricia balloon gastrostomy, 18Ch, external retention device @ 3.5cm, 15ml H2O in balloon, inserted 24/11/2015 at PH endoscopy

Halyard MIC-KEY low profile balloon gastrostomy, 20Fr, 2.5cm stoma length, 5ml H2O in balloon, inserted 10/11/2015 @ PH PEG clinic
MODULE 2:
PEG/gastrostomy tube insertion and removal skills
Understanding initial PEG insertion
In most cases a patient’s first, or “initial PEG” is inserted in endoscopy by a Gastroenterologist. It is usually a “non-balloon” tube.

https://www.youtube.com/watch?v=09UxdjLVAvE
Feeding post initial PEG tube insertion
Refer to Gastrostomy Tube Placement and Management CPG
Commencement of enteral nutrition following insertion of an initial PEG is usually dictated by the surgeon who inserted the PEG. For each case check the instructions given on the Endoscopy/surgical report.

If there are no specific orders on the endoscopy report refer to the following regimen:

4hrs nil by PEG & NBM

Feeding
After 4hrs:
• Deliver a 50ml water bolus, via syringe, hourly for 2 hours. Day case patients MUST NOT be discharged until a minimum of one water flush has been administered without complication.
• If water tolerated* commence enteral feeding 6 hours post procedure as documented by unit dietitian in the medical history.
• If not tolerating* enteral feeds then contact parent unit and unit dietitian.

Medication Administration
• Medications can be commenced via the tube 4 hours post procedure. Not all oral medications are suitable for tube administration.
• Medications need to be reviewed in consultation with Pharmacy prior to proceeding with administration

*Signs of intolerance include: vomiting, aspiration, increasing abdominal distension and/or pain
Understanding initial PEG insertion & replacement
A initial PEG can remain insitu for a long time (>1 year) and usually will only be changed if the tube is degraded, inadvertently removed or malfunctioning (see daily gastrostomy care and trouble shooting module).

If an initial PEG needs to be replaced, consideration must be given to stoma site maturity: A new stoma tract requires a minimum of 4 weeks to mature and initial PEG tubes should not be replaced prior to this time.

Initial PEG tubes and non-balloon PEG tubes are to be removed by a Gastroenterologist or approved registrar while the patient is sedated in the Endoscopy/Day Procedure Unit.
Understanding balloon gastrostomy replacement

Balloon gastrostomy replacement i.e. in a patient who has had their initial PEG tube replaced previously with a balloon gastrostomy, can be performed by credentialed Dietitians and Gastroenterology Medical Officers.

Balloon gastrostomy tubes are usually *only* replaced when they are:
- Tubes that have been insitu for ≥6 month
- Malfunctioning, not working adequately
- Deteriorated in condition effecting function
- The balloon or balloon valve has failed
- Inadvertently removed or pulled out
- Causing stoma site complications
- Being changed to a low profile device
(see troubleshooting module for more information)

Reasons *not* to change a balloon gastrostomy tube include:
- Where the patient has an advanced care plan that states replacement is not to occur
- If a competent patient refuses replacement
- If the tube is no longer required (see Permanent Removal section)
Balloon gastrostomy replacement – step-by-step at PH

*If possible, request the patient to fast from midnight, or after their first feed of the day.*

Once the insitu gastrostomy tube has been identified (Type and removal method) – select an appropriate replacement gastrostomy tube.

Consider:
- *French size* (usually the same as previous tube to ensure a good fit to the stoma)
- *Stoma length* (if applicable for low profile tube)
- *Type of tube required* e.g. with/without clamp, regular or low profile, depending on patient needs

For planned tube replacements, some patients will bring a spare gastrostomy with them – this will usually be provided by their Dietitian, who will have helped select an appropriate tube for their needs.

*Low profile gastrostomy tubes*
- Considered for younger, more active patients or those who may be at risk of inadvertent removal/pulling of their tube
- Significantly more expensive than standard gastrostomy tube & require extension sets for feeding
- Not routinely kept in hospital – special order by HEN Dietitian
Preparation:
- Gather equipment (see below)
- Ensure the patient and significant others understand the procedure and obtain verbal consent (refer to [PH Consent for Treatment policy](#))
- Wash hands (refer to [PH Hand Hygiene policy](#)), apply gloves and protective clothing
- Set up dressing pack, equipment and open lubricant into dressing tray recess
- Assist patient to recline on bed if able, or tilt wheelchair
- Place ‘bluey’ or towel over patient’s lap to catch any spillage of gastric contents

<table>
<thead>
<tr>
<th>Gastrostomy change equipment</th>
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<tbody>
<tr>
<td>Sterile dressing pack</td>
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<tr>
<td>Replacement PEG balloon tube</td>
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<tr>
<td>Lubricant</td>
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<tr>
<td>10ml Sterile water ampoules (x2)</td>
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<tr>
<td>20ml syringe (x2)</td>
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<tr>
<td>Sodium chloride solution</td>
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<tr>
<td>60ml syringe</td>
</tr>
<tr>
<td>Split gauze (if required)</td>
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<tr>
<td>Protective eyewear &amp; gown</td>
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<tr>
<td>Gloves</td>
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<tr>
<td>Stethoscope</td>
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<tr>
<td>“Bluey’s”</td>
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</table>
Removal of balloon gastrostomy tube:

1. **BEFORE** removing the in-situ gastrostomy tube, draw up appropriate amount of sterile water into syringe and inflate new gastrostomy balloon – test the balloon for leaks by gently squeezing/rolling between fingers, then withdraw water and close feeding ports. Apply lubricant to balloon tip of tube and place in sterile dressing tray ready for insertion.

2. Rotate the tube that is to be removed to ensure no adhesion to the stoma tract

3. Insert 20ml syringe into balloon inflation/deflation port and withdraw all the fluid from the internal balloon – this may take several attempts

4. Support the surrounding skin while gently rotating and pulling the tube out – this will reduce discomfort

If resistance is encountered, slide the external retention device up close to the external feeding port, lubricate tube and stoma then simultaneously rotate and push tube in slightly and gently manipulate tube free

If unable to remove tube:
- Gently push tube back in to its original place
- Reinflate the balloon
- Readjust the external retention device
- Cease procedure - refer to the Gastroenterologist

**Note:** This video is an example only, your practical supervisor may provide additional/alternative recommendations.
Insertion of replacement gastrostomy tube:

**Note:** Always refer to the particular manufacturers instructions

1. Insert the replacement tube through the existing tract, well into the stomach - use gentle pushing and twisting motion that assists guidance and reduces buckling during passage

2. Inflate the balloon with the amount of sterile water recommended in the manufacturer’s instructions (use the filled syringe you tested the tube with prior)

3. Gently withdraw the tube until resistance of the balloon is felt resting against the inner wall of the stomach

4. Move the external retention device down the tube until there is a 2-5mm gap between it and the abdominal skin (should feel firm)

5. Wipe clean and dry around the tube, stoma site and along tube with saline and gauze

Apply split gauze to the stoma if there is any ooze present (minor bleeding post removal of old tube is not uncommon). Advise patient this can be removed once bleeding/ooze resolved.

**Low Profile balloon gastrostomy replacement video**

Note: This video is an example only, your practical supervisor may provide additional/alternative recommendations

If unable to insert tube:
- If greater than moderate resistance is encountered, cease the attempt at gastrostomy replacement
- If possible, advance a smaller french gastrostomy tube through the stoma tract and refer to Gastroenterologist
Insertion of replacement gastrostomy tube:

Consider placement of the external retention device in the supine and sitting position if able. Remember between 2-5mm is recommended between the abdomen and external retention device (about the thickness of a coin) to prevent stoma site complications. See the trouble shooting module for more information.

“The tube was too tight, she was in pain and ended up with a pressure area around her stoma...then it got infected”

“It was so loose, feed and stomach acid was coming out all around the tube. It was burning his skin, I was worried the tube would catch on his clothing and get pulled out”
**Confirming replacement balloon gastrostomy tube position:**

Confirm the correct position of the tube in the stomach by:

- Auscultation of the epigastrium during air insufflation
- Aspiration of gastric contents
- Infusion of water (50ml)

➢ If the tube is in the correct position, feeding can recommence immediately

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If there is **any doubt** regarding tube position:

A Gastrogaffin study via the tube (known as a PEG-O-Gram) needs to be performed

- Contact the Gastroenterology team to review PEG and order as required
Don’t forget!
Document the PEG tube replacement in the patient’s history/gastrostomy report:
• When and where
• Brand, type and Fr size of the tube
• Centimetre marking of the tube at flange/stoma site.
• Amount of fluid in the balloon (if appropriate)
• Position confirmation technique
• Any concerns/observations
• Any directions re: feeding/stoma site care/follow up
Planned permanent gastrostomy removal
Permanent removal of a gastrostomy tube should be discussed with the multidisciplinary team – in particular the patient’s Gastroenterologist and Dietitian. The timeframe for removing gastrostomy tubes is variable and the decision should be made on a case-by-case basis, with consideration given to:

- Wishes of the patient/carer
- Does the patient have a mature stoma?
- Can the patient eat and drink safely?
- Can the patient take medications orally?
- Is the patient consuming adequate oral intake to maintain
  - Goal weight
  - Appropriate growth (in children/teenagers)
  - Hydration
  - Micronutrients (with or without supplementation)
- Is the patient clinically stable?
- What is the patient’s likely future health care needs/potential to need artificial feeding in the future?
- Does the patient/carer understand the implications and process of gastrostomy removal, including risks if reinsertion is required?
Planned permanent gastrostomy removal

Clinician experience suggests **fasting from midnight** the night before planned permanent removal of a balloon gastrostomy tube to prevent excess leaking of gastric contents when the tube has been removed.

For **balloon gastrostomy tubes**:
Follow steps as per standard balloon gastrostomy removal procedure, with application of gauze or absorbent dressing to old stoma site to prevent initial leakage of gastric juices onto clothing.

**Initial PEG tubes and non-balloon PEG tubes** are to be removed by a Gastroenterologist or approved registrar in the Endoscopy/Day Procedure Unit.

The patient should **fast for approximately 2 hrs post procedure**, and consume small frequent meals until the stoma has closed (usually within 2-4 days).

*Persistent gastric fistula following gastrostomy tube removal*
If the stoma tract does not close within one week, or there is ongoing output from the stoma, the patient should be referred for Gastroenterology review.
MODULE 3:
Gastrostomy care and troubleshooting
**Gastrostomy care and troubleshooting**

Gastrostomy tube complications may be minor (wound infection, minor bleeding) or major (necrotizing fasciitis, colocutaneous fistula). Most complications are minor.

Most studies have suggested that complications are more likely to occur in older adults with comorbid illnesses, particularly those with an infectious process or who have a history of aspiration.

Most gastrostomy and stoma site complications can be prevented with simple, daily care and adequate flushing of the tube with water pre and post feeds/medications.
Daily gastrostomy tube care

Daily gastrostomy tube care will help keep the stoma site healthy and tube in good condition. Patients and carers should be educated on recommended steps for daily gastrostomy care:

1. **Hand hygiene** – hands must be washed before and after touching the tube and device
2. **Clean stoma site daily to twice daily if required with warm soapy water**
   - Clean in the shower (do not submerge unless mature stoma)
   - A cotton bud can help clean under the external retention device
3. **Clean the feeding tube gently** – remove any feed build up on tube/device
4. **Dry skin and tube well, including under the external retention device**
   (Application of a dressing to the stoma site is only required for the first days post initial insertion, if at all. Most patients do not require a dressing after this time unless excessive leakage or ooze is present. If this is the case, further investigation to the cause is required)
5. **Check skin & tube** - observe for unusual redness, purulent discharge, hyper granulation tissue, tenderness of skin and any damage/wear on tube
6. **Rotate the tube 360°** *Day 2 or 3 rotate tube 360 degrees and continue daily (if tube was inserted radiologically tube is not to be rotated if stitches are in place).*
7. **Check the external retention device measurement against the tube numbering to ensure the tube is not migrating** (moving in and out of stomach)
   - The external retention device should be positioned 2-5mm to the skin (about the thickness of a coin)
Gastrostomy care and troubleshooting – Gastric fluid leakage

Gastric contents or feed leaking from stoma site, around the tube
• Can cause skin breakdown and excoriation
• Can require frequent dressing changes & affect quality of life (frequent clothing changes etc.)

Some stoma sites leak intermittently - it isn’t always gastric fluid and may not cause problems however should be assessed. Some patients can be very anxious and require reassurance that such leakage is normal.
Gastrostomy care and troubleshooting – Gastric fluid leakage

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible causes</th>
<th>Options for Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balloon is not inflated</td>
<td>Valve failure&lt;br&gt;Pin-hole in the balloon&lt;br&gt;Volume loss by osmosis&lt;br&gt;Balloon inflation volume not as per manufacturers guidelines</td>
<td>Regular checking of the balloon fill and valve competency&lt;br&gt;Refer to manufacturers guidelines&lt;br&gt;Consider high volume balloon</td>
</tr>
<tr>
<td>rupture</td>
<td>Accidental balloon over fill&lt;br&gt;Inappropriate access to balloon port&lt;br&gt;Age of device&lt;br&gt;Yeast colonisation&lt;br&gt;Product fault</td>
<td>Replace the device</td>
</tr>
<tr>
<td>Gastrostomy position</td>
<td>Site too close to the pylorus&lt;br&gt;Conditions where the relative positions of the stomach and the stoma tract change (e.g. worsening scoliosis)</td>
<td>Review enteral tube feeding regimen - consider reducing volume and increasing bolus frequency or transition from bolus to continuous&lt;br&gt;Review device type and consider change of brand or to a tube/device with different features of the internal bumper for less interference with the gastric outlet&lt;br&gt;If not resolved, medical review; consider re-siting</td>
</tr>
<tr>
<td>Inadequate stoma seal</td>
<td>Weight loss or patient growth&lt;br&gt;Poor device fit and/or correct device fit not maintained&lt;br&gt;Movement of device by external forces (e.g. wheelchair straps, belts, clothing etc.)</td>
<td>Dietetic review and consider change in tube feeding regimen&lt;br&gt;Assess stoma seal - review the fit and condition of the existing device. Consider over filling of the balloon within manufacturer’s device specifications. Adjust or replace the device as appropriate&lt;br&gt;Note the external flange should move away from the skin by a few millimetres when traction is applied to the device&lt;br&gt;Patient/carer education</td>
</tr>
<tr>
<td>Poor gastric emptying</td>
<td>Increased intra-abdominal pressure (coughing, straining to open bowels, retching)&lt;br&gt;Infection</td>
<td>Medical review&lt;br&gt;Manage constipation if present&lt;br&gt;Consider venting of the gastrostomy</td>
</tr>
</tbody>
</table>

Note: Current evidence does not support insertion of a larger French tube to treat gastric leakage – however may be considered in some circumstances.
Gastrostomy care and troubleshooting – Hypergranulation

Also known as overgranulation or “proud flesh”, this vascular tissue is common although the exact aetiology is unknown. It is thought its development may be related to extended inflammatory response and/or excess moisture or friction related to tube movement.

The tissue is often:

- Moist
- Soft to touch
- May bleed easily

A small amount of granulation tissue is normal.
Gastrostomy care and troubleshooting – Hypergranulation

Granulation tissue **does not require treatment** unless it is problematic i.e.:
- Painful
- Infected (swabbing the affected area should be considered)
- Growing to an excessive amount

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Routine Stoma Care</th>
<th>Further Options for Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Moisture</td>
<td>• Cleanse and dry the skin surrounding the stoma using soap and water or consider using hypertonic saline.</td>
<td>• Application of a foam dressing (without causing excessive traction).</td>
</tr>
<tr>
<td>• Infection</td>
<td>• Keep site free of moisture – avoid use of moisture retentive dressings.</td>
<td>• Apply hypertonic saline/hypertonic dressing to granulated tissue every 2 hours.</td>
</tr>
<tr>
<td>• Excessive device movement</td>
<td>• Prevent excessive movement by securing the external retention device with a 2-5mm gap (when gentle traction is applied) between the device and the skin.</td>
<td>• Short term use of topical corticosteroid as directed by the prescriber and not in cases of suspected infection.</td>
</tr>
<tr>
<td>• Ill-fitting devices</td>
<td>• Avoid continuous traction on the device.</td>
<td>• Consider biofilm prevention with the use of antiseptics and other open wound cleaning agents.</td>
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<td>• Consider the application of a caustic agent such as silver nitrate or copper sulphate (with appropriate protection for surrounding skin). This should only be used by persons familiar with its application and possible complications.</td>
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<td></td>
<td></td>
<td>• If unresponsive to the above refer for a medical review.</td>
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</table>

*Note - Mechanical removal (surgical excision and diathermy) is not recommended.*
## Gastrostomy care and troubleshooting – Skin/site complications

Other common skin/site complications are listed below

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible causes</th>
<th>Options for Management</th>
</tr>
</thead>
</table>
| Excoriation/skin breakdown  | • Leakage of gastric secretions  
  • Moist dressings left in contact with skin                                  | • Correct cause of leakage – see previous table  
  • Application of barrier cream  
  • Keep the site clean and dry  
  • Ensure that dressings are frequently changed and not left moist  
  • Or removed if not required  
  • Consider pharmacological options such as proton pump inhibitors and/or prokinetics |
| Pressure related injury      | • Improper fit of device (too tight)  
  • Inadequate rotation or adjustment of device  
  • Excessive traction  
  • Dressings causing pressure between external flange and skin                  | • Relieve pressure and ensure correct size and fit of device  
  • Perform daily rotation and position adjustment  
  • No routine application of dressings without clinical indication  
  • Seek wound management advice for skin breakdown                              |
| Embedded sutures             | • Sutures dwell time                                                            | • Discuss the option of removing sutures with the surgeon/admitting team  
  • Seek wound management advice for skin breakdown                               |
| Infection\textsuperscript{2} | • Encouraged by excessive moisture around stoma site  
  • Invading micro-organism – may be fungal or bacterial  
  • Infection may be introduced at time of device insertion  
  • Inflamed hair follicle                                                       | • Avoid excessive moisture around stoma site  
  • Perform swabbing/culture and sensitivities  
  • Consider treating with anti-fungal preparations or antibiotics where appropriate  
  • Seek wound management advice for skin breakdown                              |
### Gastrostomy care and troubleshooting – Tube dysfunction + deterioration

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<thead>
<tr>
<th>Problem</th>
<th>Possible causes</th>
<th>Options for prevention and management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube or device blockage</td>
<td>• Use of poorly crushed medications or medications unsuitable for crushing and placing down gastrostomy device.</td>
<td>• Seek pharmaceutical advice prior to using crushed medications.</td>
</tr>
<tr>
<td></td>
<td>• Inadequate water flushing post feeding and/or administration of medications.</td>
<td>• Consider the use of liquid/compounded medications or medications which dissolve where possible.</td>
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<tr>
<td></td>
<td>• Siphoned gastric fluid has flowed back into the device by fluid displacement and solidified.</td>
<td>• Give medications individually followed by a flush in between and after each medication.</td>
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<td></td>
<td>• Material fatigue associated with device aging or mishandling.</td>
<td>• Routine flushing should be included in the enteral feeding regimen.</td>
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<td></td>
<td>• Including a stand-alone flush prior to longer periods between access (e.g. before going to bed) may also assist in the prevention of device blockage.</td>
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<td></td>
<td></td>
<td>• Use of clamp on device when possible.</td>
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<td></td>
<td></td>
<td>• Replace device.</td>
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</table>

Cross section of new, patent tube compared to tube with extensive build up causing slow feed rate and blockage.
Gastrostomy care and troubleshooting – Tube dysfunction + deterioration

General guidelines for unblocking gastrostomy tube or device

1. Inspect for mechanical occlusions e.g. clamps, ports, connectors
2. Try gently massaging the tube to break up any clogged medications and then flush with 30ml of warm water
   • If this doesn’t work, use the ‘push-pull’ method:
     Connect a syringe with 30ml of warm water into the feeding port and push/pull the plunger in and out several times
     This may take some time, be persistent, however excessive force should not be used
   • In some situations (e.g. difficult to replace tube) acid, alkaline or enzyme solutions may be deemed appropriate by the health care team to unblock a device if the above technique is unsuccessful – talk to the unit/patient’s Dietitian

Using liquids such as cola, acidic juices, meat tenderizer and guide wires are **not** recommended as these products may damage the gastrostomy tube or stomach.

Consider the following algorithm for guiding replacement of a gastrostomy tube that is blocked:
BLOCKAGE OF PEG TUBE

INITIAL PEG

BLOCKED TUBE

ATTEMPT TO ASPIRATE BLOCKAGE & DISCARD

FLUSH WITH 50MLS WARM WATER AND FLUSH USING MODERATE PRESSURE. CLAMP TUBE WAIT 10 MINS. THEN WITHDRAW (DO NOT USE FIZZY DRINKS AS THEY WILL DEGRADE THE TUBE)

PATENT

RECOMMENCE FEEDING & PEG CARE REGIMEN

REMAINS BLOCKED

PEG INSITU < 1 MONTH REFER FOR ENDOSCOPIC GUIDED REPLACEMENT VIA GASTRO REG

PEG INSITU 1-3 MONTHS GASTRO R/V & REPLACE WITH CONTRAST FLUOROSCOPY

PEG INSITU > 3 MONTHS REPLACE & CONFIRM ONLY IF DIFFICULT OR UNCERTAIN WITH CONTRAST FLUOROSCOPY

CHECK PLACEMENT WITH AIR ASCULTATION AND OR ASPIRATE AND LITMUS TEST
# Gastrostomy care and troubleshooting – Tube dysfunction + deterioration

<table>
<thead>
<tr>
<th>Tube or device deterioration</th>
<th>The following is specific to silicone tubes and devices (the most common type of gastrostomy device):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Gastrostomy tube or device deterioration is characterised by structural changes in the device that render it fragile and no longer freely patent. This increases the risk of breakage. A fragile perished device becomes useless and problematic due to the risk of unrepairable hole formation, increased risk of balloon failure (if present) and increased difficulty to remain intact on removal. The following are characteristics that a device may display as it reaches its end stage of function:</td>
</tr>
<tr>
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<td>- the device becomes very soft, pliable and easily kinks,</td>
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<td>- the device’s contour becomes distorted,</td>
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<td>- the wall thickens thus narrowing the internal lumen.</td>
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<td>- white and/or black dots may appear on the internal wall of the device and these dots maybe microorganism colonies. There appears to be a correlation between fungal colonisation, changes in the devices’ structure and the devices’ functional lifespan.143</td>
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<td></td>
<td>- discoloration of the device can occur early in the devices’ life and can be caused by a number factors i.e. medication.</td>
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<td></td>
<td>• The decision of when to replace a gastrostomy device should be based on the following criteria: manufacturer’s recommendation, patient requirements and the first sign of the device’s change in contour.</td>
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</tbody>
</table>

Examples of warping, discoloration & fungal growth in gastrostomy tubes
Gastrostomy care and troubleshooting – Tube dysfunction + deterioration

If the gastrostomy is an initial, non-balloon tube and the problem is only near the distal tube end (e.g. hole in tube or tube deterioration near the port)

1. Double check the PEG tube does not have a balloon
2. Close PEG clamp (to stop flow of gastric juices)
3. Remove Y port (twist and pull motion – hold distal end of tube to prevent tugging)
4. Cut off broken/deteriorated end of tube
5. Replace Y port (twist and push motion)

ENSURE you identify that the tube does not have a balloon – if you cut the tube on a balloon PEG you will also be cutting the balloon chamber, this will deflate the balloon and the PEG will fall out!
Gastrostomy care and troubleshooting – Tube dysfunction + deterioration
If a gastrostomy port is broken/malfunctioning, it does not usually mean the whole tube needs to be replaced. Ports may or may not be changeable depending on tube type and brand.

Can replace easily if removable (replacement ports available from some suppliers)

If old port broken (e.g. port cap broken off) but unable to remove can ‘piggy back’ a removable port
Gastrostomy care and troubleshooting – Tube dysfunction + deterioration
Fungal growth

Isolated, black fungal growth in gastrostomy tubes is not uncommon, and can be managed with regular water flushes and use of a “Bard” PEG brush to gently clean the tube (ask the unit or HEN Dietitian).

Extensive fungal growth that is unable to be removed may require treatment with anti-fungal flushes (e.g. Nilstat) or if it is penetrating the tube it may require replacement. Discuss with the patient’s Gastroenterologist or Dietitian.

Extensive fungal growth penetrating gastrostomy tube material
Bard PEG cleaning brush
Gastrostomy care and troubleshooting – Tube migration

Migration of the gastrostomy tube into the stomach can result in the internal retention device migrating down the GI tract with peristalsis.

Usual causes are incorrect placement of the external retention device, or slippage of the external retention device e.g. The external retention device is no longer at it’s usual cm marker (5cm compared to 2cm) or the Y port is sitting at skin level.

Symptoms of gastric outlet obstruction may be evident:
- Nausea & vomiting, epigastric pain, abdominal distension

Management
1. Attempt to pull gastrostomy tube back to usual cm marking – if unable, ask pt to relax/de-tense stomach muscles
2. Secure external retention device to correct cm marking
3. Confirm tube placement (as per replacement methods)

- Consider using ‘bread tie’ clip from an initial PEG to secure external retention device or a low profile device if ongoing issues with migration


Do not pull tube back to usual cm marking if excessive resistance! If the tube has a balloon consider deflating, then attempt to pull gastrostomy back to usual cm mark and reinflate balloon. If excessive resistance still encountered contact Gastroenterology.
Gastrostomy care and troubleshooting – Buried bumper syndrome

Buried bumper syndrome is a rare long-term consequence of a too tight external retention device. As tension is created on the gastrostomy tube, the internal retention device slowly erodes into the gastric wall or up into the stoma tract. The diagnosis can be confirmed on endoscopy, which will demonstrate the internal bumper buried within the gastric mucosa.

Symptoms include:
• Localised pain
• Inability/difficulty infusing feed
• Leakage of feed/fluid around the tube (when distal end of the tube is in the stoma tract instead of the stomach)
• Inability to advance or rotate the tube

Can be identified by:
• External retention device sitting tighter than usual (e.g. below 1cm mark)
• Tube is difficult to advance/rotate
• Leakage of feed, pus, fluid
• Pain – continual and/or with tube use
Gastrostomy care and troubleshooting – Buried bumper syndrome

Prevention
- Maintain a correct external retention device position i.e. 2-5mm from skin when gentle traction applied to tube
- Avoid unnecessary traction or pulling – ensure the tube is adequately secured under clothing
- Daily 360° rotation of tube
  *only commence rotation of tube 2 weeks post initial insertion
- Gently push tube in slightly and pull back out once per week (prevents internal retention device becoming buried in gastric mucosa)
- Avoid dressings under the external retention device
- For low profile devices – ensure appropriate fit to stoma length, monitor for changes in weight.

Treatment
If ‘Buried bumper’ is suspected, the patient should be referred to the Gastroenterology Registrar for investigations and removal/replacement in endoscopy.
Gastrostomy care and troubleshooting – Dislodged tube

Usually occurs due to:
• Burst or deflated balloon
• Tube disintegration
• Patient pulling at tube or snagging tube on clothing, equipment etc.

A displaced tube requires **immediate attention** to prevent the stoma tract from closing (in some cases as soon as 4hrs).

The most important consideration when deciding how to replace a dislodged gastrostomy tube is the **maturity** of the stoma tract!

Consider the following algorithm to guide replacement of a dislodged tube:
If the gastrostomy has partially come out, and the stoma site is **mature**, gently advance the tube back into the stomach, attempt to reinflate the balloon & confirm position.
Gastrostomy care and troubleshooting – Dislodged tube

It is very important to use a dedicated gastrostomy tube for replacement, or if a dedicated tube is not available a Foley catheter can be used as a temporary measure to keep the stoma tract open.

If using a Foley catheter it should be of equivalent size and adequately secured for feeding.

Foley catheters are not recommended as a long term replacement feeding tubes as:
• They do not have an external retention device increasing risk of migration and gastric outlet obstruction
• A ‘spigot’ or stopper is required to cap off the distal end
• The closed proximal end increases risk of obstruction
• There is risk of posterior gastric mucosa ulceration due to exposed tube past the balloon.

The Peninsula Health (HEN) Dietitian provides patients registered on the program with a spare gastrostomy tube in case of inadvertent tube removal.

If you need to access a gastrostomy tube, contact the Nutrition or Endoscopy Department.
Gastrostomy care and troubleshooting – GI complications

Common gastrointestinal complications related to gastrostomy feeding include: *Click on the links to see possible causes and options for management*

- Diarrhoea
- Constipation
- Nausea
- Vomiting

If symptoms do not improve with simple measures the patient should be referred to their medical specialist/gastroenterologist.
<table>
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<tr>
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</table>
| **Diarrhoea** | Infection | • Referral for medical review  
• Stool sample  
• Ensure patient remains hydrated until medical review |
| | Overflow diarrhoea (from faecal impaction due to constipation) | • Referral for medical review  
• Ensure patient remains hydrated until medical review |
| | Commonly implicated medications:  
• Antacids (magnesium salts)  
• Antibiotics  
• Histamine  
• H1 receptor blockers  
• Laxatives  
• Cytotoxics  
• Proton Pump Inhibitors  
• Hyperosmolar medications (e.g. ferrous sulphate, multivitamins, potassium chloride)  
• Magnesium sulphate  
• Sorbitol elixirs. | • Referral for review of medications/aperients |
<p>| <strong>Diarrhoea continued</strong> | Enteral tube feed delivery issues (temperature, rate, volume, concentration, osmolality) | Ensure the tube feed is at room temperature prior to feeding. If the feed is kept in fridge, measure required volume and allow to stand for 30 minutes before use. |</p>
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| **Constipation** | Inadequate hydration | • Assess fluid requirements  
 • Monitor fluid input |
| | Disruption of normal routine: | • Discuss activity with physiotherapist/ managing team or GP  
 • Consider change of feeding regimen. |
| | • Inactivity/ immobilisation  
 • Lack of toileting privacy. | |
| | Other causes: | • Refer for review of medications  
 • Consider adding:  
 - Stool softeners  
 - Appropriate laxatives  
 - Prokinetic agents.  
 • Consider establishing a bowel management regimen |
| | • Neuromuscular disorders or brain injury  
 • Hypothyroidism  
 • Hypokalaemia  
 • GI motility disorder  
 | |
| | Commonly implicated medications: | |
| | • Anticholinergics  
 • Non-steroidal anti-inflammatory drugs (NSAIDs)  
 • Bile acid sequestrants  
 • Frusemide  
 • Antidepressants.  
 | Previous misuse of laxatives |
| | GI obstruction | • Refer to managing team or GP  
 • Cease feeding |
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| Nausea                        | Intolerance of current enteral tube feeding regimen:  
- Volume of feed too great  
- Rate of infusion too fast | Adjust regimen, consider:  
- Reducing bolus volume and/or delivery over longer period  
- Replacing bolus feeds with continuous feeding  
- More concentrated feed  
- Slower rate of feeding/extend period of feeding.  
Consider referral for trial of prokinetic |                                                                                                                                                                                                                       |
|                               | Feed too cold when administered                                                                                                                | Ensure feed at room temperature prior to feeding. If feed kept in fridge, measure required volume and allow to stand for 30 minutes before use.                                                                    |
|                               | Increased intra-abdominal pressure due to constipation                                                                                           | See section on constipation (page 52)                                                                                                                                                                                  |
|                               | Side effect of medication                                                                                                                     | Request review of medications  
Consider prescribing anti-emetic/pro-kinetic medication                                                                                                                                                               |
|                               | Incorrect positioning of patient during feeding or movement/ repositioning too soon after completion of feeding                                  | Ensure patient is upright (>30 degrees) during feeding and for 30 minutes after feeding  
Consider lying patient on right side  
Liaise with other health professionals to ensure appropriate timing of interventions and care |
|                               | Stress and anxiety related to feeding                                                                                                           | Pleasant feeding environment  
Relaxation techniques  
Consider referral to other health professionals for anxiety management  
Support from family/carers                                                                                                                                 |


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| Vomiting | Intolerance of current feeding regimen:  
- Volume of feed too great  
- Rate of infusion too fast  
Incorrect positioning of patient during feeding  
Gastro-oesophageal reflux disease (GORD)  
Stress and anxiety related to feeding | Consider adjusting the feeding regimen:  
- Reduce bolus volume and/or delivery over longer period  
- Replace bolus feeds with continuous feeding  
- Consider more concentrated feed  
- Slow rate of feeding/extend period of feeding  
Consider referral for trial of a prokinetic  
Ensure patient is upright (>30 degrees) during feeding and for 30 minutes after feeding  
Consider lying patient on right side  
Liaise with other health professionals to ensure appropriate timing of interventions and care  
Optimisation of anti-reflux therapy with PPI  
Consideration for use of prokinetics/post pyloric feeding  
Referral back to surgeon for consideration of anti-reflux surgery  
Pleasant feeding environment  
Relaxation techniques  
Consider referral to other health professionals for anxiety management  
Support from family/carers |
References and required further reading/viewing:

- The Agency for Clinical Innovation and the Gastroenterological Nurses College of Australia, *A Clinician’s Guide: Caring for people with gastrostomy tubes and devices (From pre-insertion to ongoing care and removal)* Version 1.2: March 2015
  

  “Rob’s story” video
  

Up to date®:

- Gastrostomy tubes – replacement and routine care
  

- Gastrostomy tubes – complications and their management
  

- Nutricia ENFit Safer Enteral Feeding Connector transition [https://www.youtube.com/watch?v=v_VKng8cqxI](https://www.youtube.com/watch?v=v_VKng8cqxI)

- Peter Mac enteral feeding administration videos
  

- Halyard MIC-KEY video [http://www.halyardhealth.co.uk/media/17549652/index.html](http://www.halyardhealth.co.uk/media/17549652/index.html)

SVHM policies:

- Consent for Treatment policy
- Hand Hygiene policy and EKP module
- PEG Tube Replacement policy
- Enteral Feeding Policy
- Medically Assisted Nutrition and Hydration Policy