



## Enteral Tubes and Feeding - Adults Clinical Practice Standard

### Purpose

The purpose of this policy is to establish minimum practice standards for the care and management of enteral tubes and feeding throughout the WA Country Health Service (WACHS).

Removing unwanted variation in clinical practice and following best practice guidelines has been found to reduce inappropriate care (overuse, misuse and underuse) thus improving health outcomes, reducing preventable harm and decreasing wastage.

This policy is to be used in conjunction with:

- WACHS Nutrition Clinical Practice Standard
- WACHS Adult Dysphagia Screening and Assessment Clinical Practice Standard
- WACHS Total Parenteral Nutrition Clinical Practice Standards
- WACHS Refeeding Clinical Guideline (in development)

Further information relating to specialty areas including Child and Adolescent Health Service (CAHS), Women and Newborn Health Services (WHNS) can be found via [HealthPoint](#) if not covered in this policy.

### Scope

This policy provides standards for the management of nutrition and medical care for patients requiring enteral feeding in any acute, subacute or residential aged care facilities (RACF) within WACHS. Management of community living clients with enteral feeding tubes is outside the scope of this policy.

All medical, nursing, midwifery and allied health staff employed within the WACHS.

All health care professionals are to work within their scope of practice appropriate to their level of training and responsibility.

Further information may be found via [HealthPoint](#) or the [Australian Health Practitioner Regulation Agency](#).

### Procedural Information

- [Initiation of enteral feeding](#)
- [Flowchart for Nutrition Support Planning](#)
- [Managing Naso Feeding Tubes \(NGT/NJT/OGT\)](#)
- [Management of Nasal and Oro Tubes](#)

- [Gastrostomy Tube – Insertion](#)
- [Gastrostomy Tubes – Ongoing Management](#)
- [Gastrostomy Tube Replacement Guideline](#)
- [Administration of Enteral Formulas](#)
- [Administration of Medications](#)
- [Gastric Residual Volume \(GRV\)](#)
- [Adult After Hours Enteral Feeding Regimen](#)
- [Home Enteral Nutrition](#)
- [Potential Problems Associated with Enteral Feeding](#)

### Considerations

Staff undertaking enteral tube insertions/changes must have appropriate skills.

Do not use any enteral tube unless the position is confirmed to be correct.

Confirmation of NGT placement by a correct NGT external length with an aspirate result below pH 5.5 and/or x-ray.

Intestinal tube placement is only confirmed by x-ray. Do not aspirate intestinal tubes.

Gastrostomy tubes with pig-tails must not be rotated.<sup>24</sup>

Immunocompromised and postpylorically fed patients require freshly opened sterile water or cool boiled water for: enteral tube flushing, aspiration and/or medication administration.

For refeeding information – refer to the WACHS Refeeding Clinical Guideline (currently in development)

### Infection Control Considerations

Staff are to comply the WACHS Infection Prevention and Control Policy.

Hand hygiene (in accordance with the 5 moments) must be carried out before and after touching a patient, patient surroundings, performing a procedure, after body substance exposure risk or removal of gloves.

Selection of personal protective equipment (PPE) must be based on the assessment of risk of transmission of infective agents, or contamination of clothing or skin of healthcare workers by blood or other body substances.

Bacterial contamination has been associated with the re-use of feed bags and administration sets<sup>33</sup>. As evidence suggests re-use is not advisable, the administration system should be considered single use only and discarded after each session.<sup>33</sup>

Similarly, enteral/oral syringes should be considered single use only and not re-used in the hospital environment.



Figure 1: Enteral Feeding Syringes

**Additional general considerations:**

- The patient has received information relating to the intended procedure, and has given appropriate consent.
- Patient identification and procedure matching processes are undertaken.
- To maintain patient privacy and dignity.
- Offer the presence of a chaperone where appropriate to patient and clinician requirements.
- Provide the opportunity for an accredited interpreter and/ or Aboriginal Liaison Officer where appropriate to the patient’s language or communication requirements. (See MP0051/17 WA Health System Language Services Policy.)

**General Information**

Enteral nutrition support refers to the delivery of a nutritionally complete feed<sup>1,2</sup> directly into the stomach or small intestine using a narrow tube.

It should be considered when a patient is unable to meet their nutritional requirements due to unsafe or inadequate oral dietary intake.

Enteral tubes may be inserted into the stomach or intestine via the nasal, oral or percutaneous routes and are used for feeding or for gastric drainage/ decompression (wide bore) [see Figure 2].

Gastrostomy and jejunostomy tubes are appropriate for longer term tube placement (greater than 4-6 weeks).

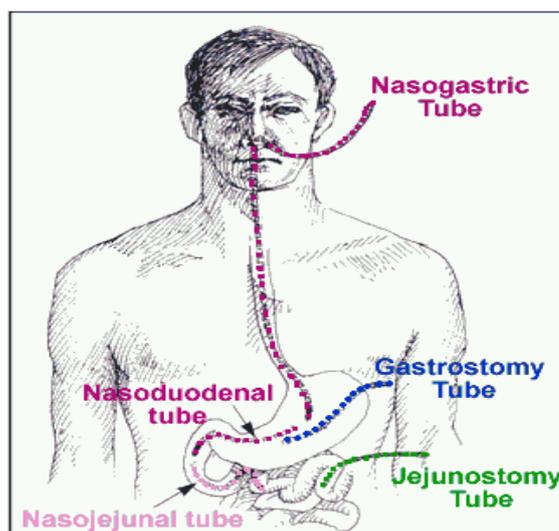


Figure 2: Options for enteral access<sup>23</sup>

Refer to [Appendix 1 for Flowchart for planning Nutrition Support](#)<sup>26</sup>

Table 1 below details sites and types of enteral feeding tubes.

Site	Tube	Indications	Advantages	Disadvantages
<b>Gastric (Stomach)</b>	Naso-gastric (NGT) Oro-gastric (OGT) Trans-oesophageal (TOF) Percutaneous endoscopic Gastrostomy (PEG) Surgically or radiologically inserted gastrostomy (RIG)	Normal gastric and duodenal emptying	Large reservoir (stomach) Cost effective Easiest to Insert Bolus feeds without a pump	Oesophageal reflux and/or pulmonary aspiration

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Site	Tube	Indications	Advantages	Disadvantages
<b>Duodenum</b>	Naso-duodenal (NDT)	Impaired gastric emptying or risk of oesophageal reflux	Early enteral feeding (e.g. 4-6 hours after trauma) Reduced risk of oesophageal reflux / pulmonary aspiration	Possible intolerance (bloating, diarrhoea). Small reservoir capacity. May require controlled feed rate. May require fluoroscopic or fiberoptic endoscopic placement
<b>Jejunum</b>	Oro-jejunal/Naso-jejunal (OJT/NJT) Surgical jejunostomy (JJ) Percutaneous endoscopic jejunostomy (PEJ) PEG & jejunal extension (JET)	Impaired gastric emptying or risk of oesophageal reflux Upper GI surgery		Risk of displacement/migration Unable to use tube aspirates to indicate feeding tolerance.

Table 1: Sites of Delivery of Enteral Feeding Tubes

### Indications for Procedure

Enteral feeding should be considered where a patient has unsafe or inadequate oral intake to meet nutritional requirements.

Benefits include:

- Preservation of the intestinal barrier function
- Reduced rate of catabolic response leading to weight loss
- Maintenance of the absorptive capabilities of the gut.

Enteral feeding can be used to:

- Reverse pre-existing malnourishment and avoid further malnutrition during hospitalisation
- Optimise recovery from significant illness or surgery
- Prevent deterioration in quality of life due to inadequate oral nutritional intake
- Rehydrate the patient

Additionally enteral tubes can also be used for:

- Administering medications
- Gastro-intestinal de-compression
- Diagnostic studies

## Contra indications for Procedure

- Gut failure, intestinal obstruction
- Inability to gain enteral access
- Palliative conditions - quality of life, possible complications and potential benefits should be considered and discussed with the significant other(s)/next of kin.

## Procedure / Key Principles

### Initiation of enteral feeding

The medical team are responsible for initiating enteral feeding. The following steps must happen prior to commencing enteral feeding:

#### 1. Nutrition assessment by Dietitian

When providing enteral nutrition support to a patient it is important to assess their nutrition status. A formal assessment based on anthropometry, biochemistry, clinical and diet history should be carried out by the dietitian. The nutrition assessment is used to determine priorities of nutritional management, estimate the patient's nutritional requirements, and provide a baseline measure for monitoring the effectiveness of intervention. Based on this assessment, a treatment goal can be set and a nutrition care plan developed.<sup>26</sup> Please refer to WACHS Nutrition Clinical Practice Standard (CPS) for more information on nutrition assessments

#### 2. Choice of site and route

Prior to commencing enteral feeding, the Medical team must determine the safest route and site for feeding. The choice of enteral feeding route depends on several factors, such as the intended duration of nutrition support, the patient's condition, and any limitations to access (such as trauma or obstructions). Refer to [Appendix One](#) for flowchart for determining appropriate route and site for enteral feeding.

#### 3. Choice of enteral feeding formula and regimes

The choice of enteral feeding regimen is based on assessment of the individual needs of the patient. The goal is to provide safe enteral nutrition and hydration appropriate to the clinical status of the patient, taking quality of life issues into consideration.<sup>26</sup> The Dietitian, in consultation with the Medical team will determine the most appropriate formula and regime to provide the patient with adequate nutrition.

#### 4. Mode of delivery

Continuous feeding:

- Continuous 24 hour feeding by gravity drip or feeding pump.
- Preferred for critically ill patients or those with rapid intestinal transit.
- Allows a low hourly feed rate leading to improved tolerance, especially for post-pyloric feeding.
- Improved control of blood glucose.
- Requires constant connection to feeding apparatus which may affect mobility and quality of life.

### Intermittent feeding:

- Feeding by gravity drip or feeding pump is stopped for 4-16 hours either day or night.
- Higher hourly rate required which may be less well tolerated.
- Higher risk of problems such as reflux, aspiration, abdominal distension, nausea and diarrhoea.
- Allows greater patient activity and is more physiological.
- Useful in transitional feeding to bolus or from tube feeding to oral intake.
- Allows medications that are incompatible with feeding formula to be administered

### Bolus:

- Rapid administration of a prescribed volume of feed or water by syringe over 15-60 minutes. Repeated at regular intervals.
- Usually into the stomach due to reservoir capacity. Convenient for gastrostomy feeding.
- The patient should have a competent oesophageal sphincter and be able to protect their airway.
- May be poorly tolerated. Highest risk of reflux, aspiration, abdominal distension, nausea and diarrhoea.
- Physiologically similar to eating pattern and may facilitate transition to/supplement oral intake.
- Allows greater patient activity and avoids expensive equipment.
- Requires more nursing time.

## 5. Transitional Feeding

Transitional feeding describes the process by which a tube-fed patient returns to an oral diet and ceases tube feeding. The ultimate goal of transitional feeding is that the patient's full nutritional needs will be met with oral intake alone.

Abrupt cessation of tube feeding is not recommended, as nutritional status may be compromised. Reductions in the tube-feeding rate should be made in proportion to increases in oral intake.<sup>26</sup>

The following processes are recommended for successful transitional feeding:

- Liaise with the Speech Pathologist to ensure safe oral intake as clinically indicated.
- Transitional feeding strategies aim to promote the patient's normal appetite and encourage an increase in oral intake. The Dietitian and Medical team may use a number of strategies to ensure adequate intake of oral diet is achieved whilst enteral feeding is being reduced. Strategies include:
  1. Ceasing feeds prior to and following meal times. The tube feeds are stopped approximately 1-2 hours before each main meal. Feeds can resume when the patient has finished eating, or 1-2 hours afterwards<sup>26</sup>.

2. Overnight Feeding. This involves feeding the patient overnight and then ceasing the feeds during the day to allow the patient to consume oral diet during the day. The length of the overnight feeding cycle will also depend upon the patient’s tolerance of increased enteral feeding rates. A more energy-dense formula (such as 1.5kcal/mL or 2kcal/mL) can be useful for meeting the patient’s needs using a lower feed rate.<sup>26</sup>
  3. Bolus feeding in between standard meal times. Can be adjusted depending on amount of oral intake.<sup>26</sup>
  4. Offering meals first and supplementing with a proportion of enteral feed if meal taken is insufficient.
- Oral intake should be monitored using MR 144c WACHS Food Intake Chart. Liaise with Dietitian to ensure regular review of nutritional requirements and feeding regime.
  - Fluid intake should also be monitored during the reduction in tube feeding using MR 144 WACHS Fluid Balance Work Sheet. Additional or larger flushes may be required if oral fluid intake is not sufficient. Consider intravenous fluid changes as well.<sup>2</sup>

**6. Discontinuation of enteral feeding**

Tube feeding can be ceased once oral intake is reliable and adequate.<sup>1</sup> If the patient is meeting 65-75% of nutritional requirements orally, it may be appropriate to discontinue tube feeding and supply oral supplements to make up the remainder.

Additional fluids and some medications may need to be given via the enteral tube once feeding has ceased for some patients.

Removal of the tube will depend on the reason for its insertion and the clinical course of the patient. Refer to [Appendix 3: Management of nasal and oro tubes – removal section](#) or [Removal of the PEG Gastrostomy Tube](#) section.

**7. Nutritional monitoring of enteral feeding**

In addition to monitoring feeding tube position, flushing and aspirates, the following nutrition support indicators are monitored based on medical and nutritional management:

Clinical Indicator	Frequency of Monitoring – Acute	Residents Monitoring
Weight	On admission and prior to commencing enteral feeding. Daily if there are concerns regarding fluid balance	On admission Daily if there are concerns regarding fluid balance
Height	On admission	On admission
Nutritional intake	Daily	Daily until clinically indicated

Table 2 continued next page

Clinical Indicator	Frequency of Monitoring – Acute	Residents Monitoring
Intake of Nutrition support (i.e. orally, enteral or parental)	Daily	Daily
Fluid balance*	Daily	Daily
Biochemistry	Twice weekly initially until stable or as clinically indicated	Twice weekly initially until stable or as clinically indicated
Bowels	Daily	Daily initially then reducing to twice weekly as indicated
Urine output	Daily	Daily or as clinically indicated
Oedema / ascites	Daily or as clinically indicated	Daily or as clinically indicated
Blood sugar levels	Daily or as clinically indicated – refer to CPS	Daily or as clinically indicated – refer to CPS
Nutrition Impact Symptoms (nausea, vomiting, appetite)	Daily	Daily or as clinically indicated
Wound staging	Daily or as clinically indicated	Daily or as clinically indicated
Refeeding specific monitoring	Daily until clinically stable – please refer to CPS	Daily until clinically stable – please refer to CPS

Table 2: Nutrition support indicators for monitoring

\* Assess dehydration by: dry skin, reduced skin turgor, dry mucosa; reduced urine output; very yellow or dark urine; low blood pressure, increased heart rate. Abnormal fluid (such as ascites, oedema) should be taken into consideration. (dehydrated patients can still be oedematous).<sup>26</sup>

Measure	Description	Method of Monitoring	Frequency
Feeding Tolerance	* gastric aspirates * abdominal distension or discomfort * bowel activity	Hospital flowsheet or fluid balance charts, medical record documentation. Daily abdominal girth measurements (using a tape measure, at umbilicus) if increasing abdominal distension. Bowel charts to record stool amount and frequency. (Bristol Stool Chart for objective classification of stool)	Daily in acute care situation; 2-3 times weekly in stable hospital patients; weekly – monthly in long term care.
Feed delivered	* is the feed rate correct? * has the patient received the prescribed amount of formula? * reasons for feed interruptions	Hospital flow sheet or fluid balance charts Pump with “total volume delivered” function Medical record documentation	Daily in acute care situation; 2-3 times weekly in stable hospital patients; weekly – monthly in long term care.
Care of feeding equipment	*regular tube flushing * PEG site care * correct taping of NGT * checking and documenting of	Hospital flow sheet/ care plans; medical record documentation. Examination of PEG/NGT site.	Daily in acute care situation; 2-3 times weekly in stable hospital patients; weekly – monthly in long term care.
Care of feeding equipment (cont...)	tube position (length marking)		
Patient positioning	*patient’s head and shoulders must be elevated 30-45° above chest level	Observation	Continuous in acute care situation; at least every shift in stable patients.

Table 3: Monitoring of Nutrition support

Table 2 & 3 source: Dietitians Association of Australia (DAA) Nutrition Support Interest Group NSW [Enteral nutrition manual for adults in health care facilities](#) (2018).

## Clinical Communication

### Clinical Handover

Information exchange is to adhere to the Department of Health Clinical Handover Policy using the iSoBAR framework.

Dietitian handover for outpatient monitoring should be completed on approved clinical handover forms and processes as per WACHS Allied Health Clinical Handover Policy

### Critical Information

Critical information, concerns or risks about a consumer are communicated in a timely manner to clinicians who can make decisions about the care.

## Documentation

At insertion	<p>Date and time of insertion</p> <p>Reason for insertion</p> <p>Type of tube</p> <p>Gauge/size of tube</p> <p>External tube length</p> <p>Nostril used for tube insertion</p> <p>Number of attempts performed</p> <p>Amount of aspirate and pH level</p> <p>Additional comments or complications</p> <p>Method used to confirm placement</p> <p>The planned date of tube replacement may be recorded in the Nursing Care Plan</p>
Aspirating tube	<p>Volume and consistency of the aspirate</p> <p>pH level</p>
Checking pH	<p>Whether aspirate was obtained</p> <p>What the aspirate pH was</p> <p>Who checked the aspirate pH</p> <p>When it was confirmed safe to administer feed and/or medication</p>
When checking placement	<p>Any tube manipulation/placement checking and details on site specific charts</p>
After medication administration	<p>Complete the medication chart and fluid balance chart</p>
After gastric decompression	<p>Gastric drainage volume (fluid balance chart)</p>
After removal	<p>Document the time of removal in the patient health record, the nursing care plan and update the fluid balance chart</p>

Documentation at the completion of each feed	Aspirate pH prior to feed commencing if using NG/NGT Aspirate volume, volume returned/discarded if using NG/NGT Name of the feed and amount administered Water administered Frequency and strength of feeds Pump Feeding set changes Aspirate amount changes/trends if using NG/NGT Problems with feeding. Complications including temperature, respiratory rate, mental state, secretions/sputum.
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Table 4: Documentation requirements for all enteral feeding tubes

Refer to the WACHS Documentation CPS.

Refer to the [Related Documents/Forms](#) section for WACHS specific forms used.

### Patient/Carer information

There are a number of ways patients and carers can obtain specific information relating to hospital admissions, transfers and discharge from hospital. Relevant documents can be located via:

- For patients being discharged into the community, refer to Appendix 11: Home Enteral Nutrition - [Discharge section](#)
- The following resources are available for use from the [Queensland Health Nutrition Materials Online - Nutrition Support Resources](#) (Enteral/Parenteral Resources) page:
  - [Enteral tube feeding at home: pump feeding\(PDF\)](#)
  - [Enteral tube feeding at home: bolus feeding\(PDF\)](#)
  - [Parenteral Nutrition \(PDF\)](#)
  - [Caring for your gastrostomy tube \(PDF\)](#)
  - [A Guide to Gastrostomy Tubes \(PDF\)](#)

## Staffing Responsibilities

### Medical Officer (MO)

- Orders insertion/inserts the enteral tube and confirms correct positioning prior to its first use.
- Estimates the patient’s daily fluid requirements in liaison with the dietitian
- Reviews and prescribes medication in consultation with the team
- Monitors blood biochemistry/haematology

### Dietitian

- Review the nutritional history, status and requirements of the patient to achieve treatment goals
- Establish the risk of refeeding syndrome
- Provide and document feeding regimen including feed type, volume, frequency and flushing
- Liaises with the MO to determine the patient's daily fluid requirements
- Liaises with the team regarding tolerance to nutrition support and adjust the regimen in response to patient's needs.
- Review weight, fluid balance, biochemistry, blood glucose levels, aspirates and bowel function or stoma output, oral intake.
- Manage transitional feeding once oral intake commences.
- Organise supplies of feeds and consumables for discharge
- Educate the patient and significant other(s)/NOK re enteral feeding regimen

### Nursing

- Monitor and document fluid balance, biochemistry, blood glucose levels, aspirates and bowel function or stoma output, oral intake
- Document weight and height on admission and monitor weight every week or as requested by the MO/dietitian
- Specialist nursing roles exist at some sites e.g. stoma nurse
- Insert some enteral tube types
- Manage enteral tube patency and confirm/monitor positioning.
- Administer nutrition support feeds and medications
- Monitor tolerance to the feeding regime
- Perform mouth care
- Educate the patient and significant other(s) / NOK including hand hygiene, tube placement care, and administration of feeds/flush

### Speech Pathologist

- Assess swallow competency and management of oral secretions.
- Prescribe modified diet textures and thickened fluids
- Recommend oral intake when appropriate

### Pharmacist

- Review medication regimen
- Provide alternative routes/forms of administration for certain drugs
- Advise on drug compatibility with enteral tubes/feeding formulas
- Advise on timing of drug administration
- Advise on preparation of medications for enteral administration.

### Compliance Monitoring

Evaluation, audit and feedback processes are to be in place to monitor compliance. This is the responsibility of the WACHS Dietetic Coordinator, every five years using the following means or tools:

- Review with key stakeholders
- Local audits of compliance with this policy

Failure to comply with this policy may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Employment Policy Framework](#) issued pursuant to section 26 of the [Health Services Act 2016](#) (HSA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

### Relevant Legislation

(Accessible via: Government of Western Australia ([State Law Publisher](#) or [ComLaw](#)))

- *Carers Recognition Act 2004*
- *Equal Opportunity Act 1984*
- *Equal Opportunity Regulations 1986*
- *Health Practitioner Regulation National Law (WA) Act 2010*
- *Occupational Safety and Health Act 1984*
- Occupational Safety and Health Regulations 1996
- *Privacy Act 1988*
- *State Records Act 2000*

### Relevant Standards

#### [National Safety and Quality Healthcare Standards](#)

Clinical Governance Standard: 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.25, 1.27

Partnering with Consumers Standard: 2.6, 2.11, 2.14

Preventing and Controlling Healthcare-Associated Infections Standard: 3.1, 3.3, 3.5, 3.8, 3.10

Comprehensive Care Standard: 5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 5.8, 5.12, 5.14

Communicating for Safety Standard: 6.11

Australian Commission on Safety and Quality in Health Care (ACSQHC) [National Standard for User-applied Labelling of Injectable Medicines, Fluids and Lines](#)

## Related WA Health System Policies

MP0095 [Clinical Handover Policy](#)

MP0122/19 [Clinical Incident Management Policy](#)

MP0086/18 [Recognising and Responding to Acute Deterioration Policy](#)

OD0657/16 [WA Health Consent to Treatment Policy](#)

MP0053/17 [WA Clinical Alert \(Med Alert\) Policy](#)

MP0051/17 [WA Health System Language Services Policy](#)

[Post Fall Multidisciplinary Management Guidelines for Western Australian Health Care Settings 2018](#)

## Relevant WACHS documents

[Adult Dysphagia Screening and Assessment Clinical Practice Standard](#)

[Adult Refeeding Syndrome Clinical Guideline](#)

[Allied Health Clinical Handover Policy](#)

[Documentation Clinical Practice Standard](#)

[Falls Prevention and Management - WACHS Clinical Practice Standard](#)

[Infection Prevention and Control Policy](#)

[Medication Administration Policy](#)

[MR111 WACHS Nursing Admission, Screening and Assessment Tool - Adults](#)

[MR120 WACHS Adult Nursing Care Plan](#)

[MR144 WACHS Fluid Balance Work Sheet](#)

[MR144C WACHS Food Intake Chart](#)

[MR60.1.10 WACHS Adult Enteral Feeding Form](#)

[MR60.1.12 WACHS Oral Nutrition Support Chart](#)

[MR64B Dysphagia Screening Tool \(Royal Brisbane Women's Hospital \[RBWH\]\)](#)

[Nutrition Clinical Practice Standard](#)

[RC5 Resident Admission Assessment Form](#)

[RC7 Resident Care Plan](#)

[Total Parenteral Nutrition Clinical Practice Standards](#)

## Policy Framework

[Clinical Governance, Safety and Quality](#)

## Acknowledgement

Acknowledgment is made of the previous SMHS / WACHS site endorsed work used to compile this Enteral Feeding Clinical Practice Standard.

Additionally with this version: WACHS Dietetic Network Working Party; nursing staff working party; pharmacists, medical and general nursing consultation.

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## Definitions

<b>Carer</b>	A person who provides personal care, support and assistance to another individual who needs it because they have a disability, a medical condition (including a terminal or chronic illness) or a mental illness, or are frail and/or aged
<b>Patient</b>	A person who is receiving care in a health service organisation

## Appendices

[Appendix 1: Flowchart for Nutrition Support Planning](#)

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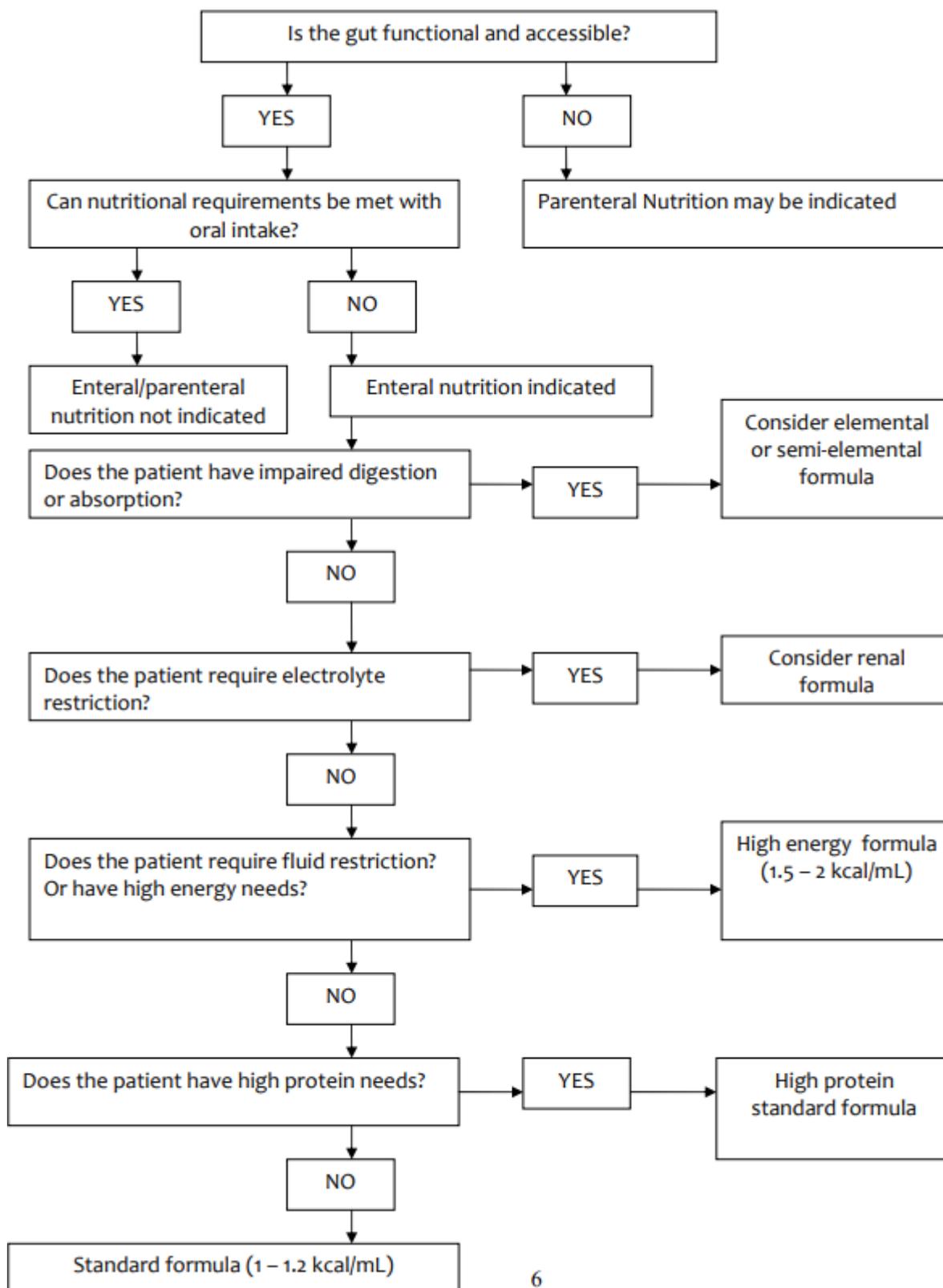
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## Appendix 1: Flowchart for Nutrition Support Planning



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Source: Dietitians Association of Australia (DAA) Nutrition Support Interest Group NSW [Enteral nutrition manual for adults in health care facilities](#) (2018).

## Appendix 2: Managing Naso Feeding Tubes (NGT/NJT /OGT)

### Pre-Procedure Key Points

Perform hand hygiene using the 5 moments



### Insertion of feeding tube

- Insertion of a NGT should be ordered by the MO
- Discuss the enteral feeding plan with the patient and/or family, and obtain appropriate consent.
- Staff inserting the NG/NGT must have the appropriate knowledge and expertise.<sup>1</sup>
- Patients who have undergone 3 failed attempts at NGT insertion must be referred to another staff member experienced in this procedure.
- NGT are not recommended for facial or base of skull fractures (OG insertion may be considered).

### Pre-insertion risk assessment

- Determine the purpose of the tube and liaise with senior staff to determine tube sizing.
  - As a guide for adults: 8-12 FG (French gauge)
  - If decompression, require large bore tube (ie 16FG) and dual lumen
- Identify contraindications or potential complications.
- Determine the last oral intake.
- Check patient allergies and sensitivities.

### Insertion and re-insertion in the following cases should be done by the MO and ONLY in consultation with the registrar of the treating medical team:

- Maxillofacial surgery / neoplasm
- Oesophageal/ nasopharyngeal
- Tumours, strictures, fistulae, surgery or varices
- Coagulopathies
- Gastric surgery or trauma
- Post upper GI surgery
- Laryngeal surgery

### Liaise with the MO if the following are identified:

- Gastric reflux
- Recurrent or violent vomiting/ retching
- Hiatus herniation
- Violent coughing
- Risk for refeeding syndrome

### Equipment Required

- Appropriate sized NG/NGT – single/dual lumen
- Lubricant
- Scissors
- Tissues
- Disposable receptacle
- 20/50mL enteral syringe as appropriate
- pH indicator strips
- Securing tape
- Torch
- PPE
- Waterproof protective sheet
- Emesis receptacle
- Tongue depressor

### Optional Equipment:

- Drainage bag
- Glass of water and a straw if not Nil by mouth or on thickened fluids
- Skin preparation wipe
- Cap/spigot
- Indelible pen

### Patient Preparation

- Ensure patient privacy.
- Explain the reasons for NG/NGT insertion and the process involved to the patient – obtain appropriate consent.
- Agree on a signal to indicate the patient wishes to stop the procedure.
- Ask the patient if they have any problems with one side of the nose.
- Examine nostrils for deformity/ obstructions and determine the best side for insertion.
- Ask the patient to blow their nose or perform a nasal toilet as clinically indicated.<sup>16</sup>
- Position patient in an upright position (30-45 degrees) as clinically indicated. Some neurological or spinal patients will be positioned according to MO instructions.
- Place the waterproof protective sheet over the chest and the receptacle within reach.
- Confirm patient's identity.
- Measure the selected tube length (cm) from nose tip to ear lobe, then bending the tube from the ear lobe to xiphoid process of sternum.
- Weighted silastic tubes should be measured from the end of the weight not the tip.
- Note the required length by reading the markings on the tube. If no markings, mark the position with tape or pen.

### Procedure

- Lubricate the tube according to manufacturer's instructions.
- Place the NGT in a clean receptacle or other appropriate clean surface.
- Insert the lubricated tube tip into the selected nostril, easing it along the floor of the nasal passage toward the ear closer to the chosen nostril.
- Advance the tube slowly.
- Stop if resistance is felt and adjust the direction slightly before proceeding. If resistance persists, remove the tube and attempt via the other nostril.
- Ask the patient to take slow even breaths throughout insertion if able to cooperate.
- As the tube passes down into the nasopharynx, ask the patient to start swallowing repeatedly, while tipping the chin downward.
- If the patient is not nil by mouth and can safely swallow, this process is aided by sipping water through a straw.
- Advance the NG/NGT with each swallow, as appropriate to the patient's swallowing ability.
- Inspect the oral cavity using a torch to ensure the tube has not coiled in the mouth.
- If patient gags excessively, withdraw tube slightly and check it is not coiled at the back of the throat.
- For unconscious patients, passage of the tube into the oesophagus may be difficult. Liaise with staff experienced in this procedure.
- Continue advancing the tube until the required marking has reached the entry into the nares.
- Withdraw the tube immediately if changes in respiratory status or speech are observed.
- Secure to the nose and cheek keeping clear of the visual field.
- Attach enteral syringe to the free end of the tube and aspirate sample of gastric contents.
- Confirm tube placement.

### Post-insertion care

- Measure and document external tube length from the nares to the hub/tube end.
- Once the tube position is confirmed, secure the tube and manage as clinically indicated.
- Tube securing tapes and skin around the insertion site should be checked at the time of insertion and at a minimum of once per shift.
- The insertion site should be cleansed with water and skin emollient applied once per shift or as clinically indicated.
- Perform mouth care every 2-4 hours or according to site based guidelines.

## Securing the NG/NGT

### If using a fit for purpose securing product:

- Attach as per the manufacturer instructions

### If using adhesive tape: (see Figure 3)

- Cut a strip of tape the same width and twice as long as the length of the nose.
- Split one end down the middle leaving one third intact.
- Clean outer aspect of nose with soap and water as indicated and pat dry.
- Apply skin preparation wipe to nose area.
- Attach the uncut section of tape to the patient's nose ([1] on Figure 3) and secure one side of the split end of tape lengthwise around the tube ([2] on Figure 3).
- Wrap the other end around the tube in the opposite direction to the first ([3] on Figure 3).
- Secure a second piece of tape over the first, across the bridge of the nose ([4] on Figure 3).
- NG/NGT may be secured to the cheek avoiding the patient's line of vision.
- Consider applying pliable hydrocolloid dressing.

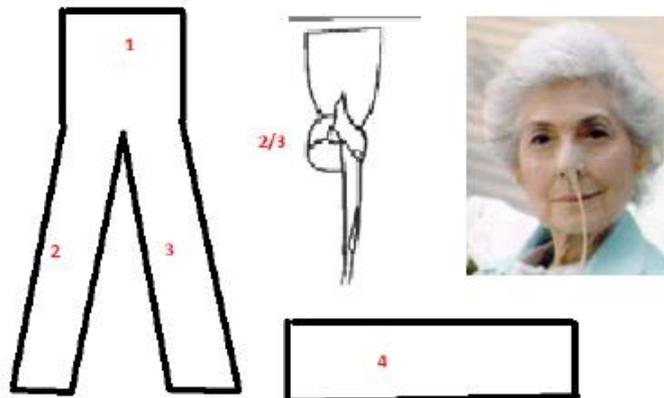
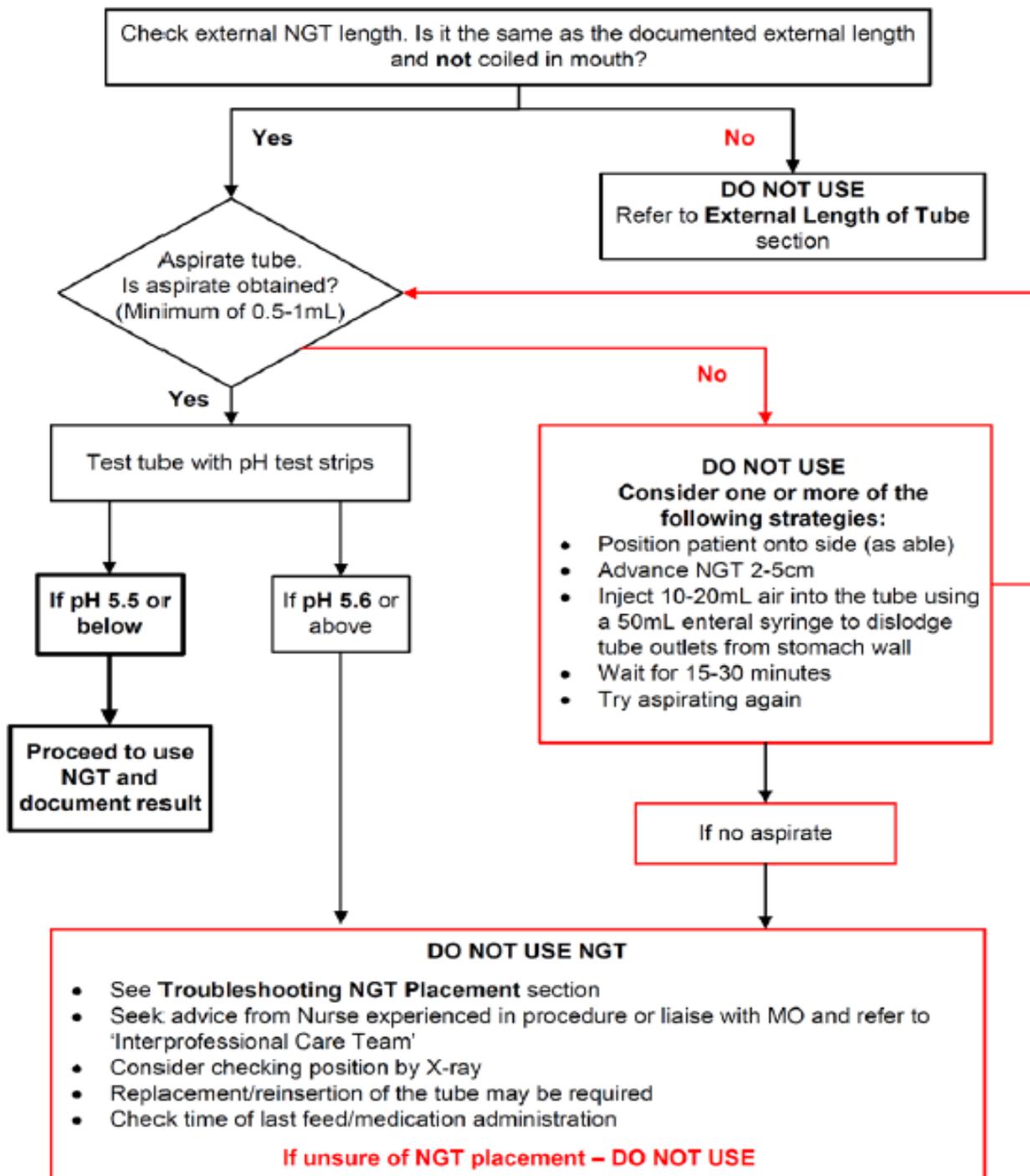


Figure 3: Adhesive tapes and positioning for securing NGT to nose (courtesy RPBG 2018<sup>24</sup>)

### Removing old tapes:

- Change as necessary when there are signs of skin irritation and when the securing tape/product is loose, soiled or due for replacement as per manufacturer's instruction.
- Consider assistance to secure NG/NGT while old tapes are removed.
- Remove old tapes while maintaining the required external NG/NGT length.
- Apply adhesive removal wipe to areas with residual tape adhesive.<sup>18,19</sup>



Algorithm for Confirming the Correct Position of NGT in Adults<sup>24</sup>

## Checking Placement of feeding tube - NGT

### General

- Liaise with MO to determine if a chest or abdominal x-ray is indicated for patients when tube placement is in doubt
- Liaise with MO for review of the x-ray to confirm correct placement prior to use. MO to document confirmation of tube placement following x-ray

If the x-ray shows incorrect positioning of the gastric or intestinal tube **do not use it**

### Nasally and orally inserted gastric tubes

- Initial placement must be checked to confirm correct placement prior to use.
- If unsure of placement do not use the tube for any purpose. Consult with Senior Nursing staff, MO and treating medical team.
- Tube placement should be confirmed every shift, prior to every use and whenever there is any doubt as to its position. For example:
  - Following insertion.
  - Once every 24 hours or as per MO instruction if not being used to administer feeds/medications.
  - Prior to each bolus or intermittent feed.
  - Following a break in continuous feeding.
  - Prior to administration of medications.
  - If the external length of the tube has changed.
  - After oro-pharyngeal suction.
  - Following a coughing fit.
  - After vomiting.
  - When the patient complains of discomfort or feed reflux.
  - In the event of sudden respiratory difficulties.
  - When a patient is transferred to another clinical area/site.
- Confirmation of placement for naso-gastric and oro-gastric tubes is by aspirate pH less than 5.5 or an x-ray.
- Subsequent confirmations of placement are by an aspirate pH of less than 5.5 and measurement of the distance between the nare and the end of tube. Tube length should correspond to the length documented at insertion. Check that tubing is not coiled in the mouth.
- Ensure at least 1 hour since feeding before pH testing. Consider acidity of medicines and other fluids administered.
- Auscultation and visual inspection are not recommended methods of checking.<sup>20</sup>

### Intestinal Tubes

- Initial placement is confirmed radiologically for naso-duodenal/naso-jejunal tubes.<sup>1</sup>
- **Do not** aspirate intestinal tubes.

## Appendix 3: Management of Nasal and Oro Tubes

Perform hand hygiene using the 5 moments



### Administration of water

When maintaining hydration and flushing the enteral tube, tap or bottled water may be adequate for otherwise healthy, immune competent and orally fed patients. However, where water supplies may not be free from contaminants, immune-compromised patients and those acute/ chronically ill patient cohorts requiring invasive enteral feeding with any presumed alteration to their gastrointestinal barrier function, it is recommended to use sterile water due to the increased risk of healthcare-associated infections.<sup>3,4</sup>

To assist in minimising the risk of microbial colonisation of the internal and external surfaces of enteral feeding tubes, expert opinion suggests fresh tap water may be used:

- To flush the tube before and after each change of feed, or bolus feed.
- Before and after tube aspiration.
- When administering medications via the tube.<sup>5</sup>

Exceptions being:

- Immunocompromised patients and those being fed postpylorically (including NJT) – freshly opened sterile water or cool boiled water should be used.<sup>2,5,6</sup>
- Breaking the feed circuit to top up a bag. If feeds are to be diluted, sterile water is recommended.<sup>6,7</sup>

### Gastric Decompression

Feeding tubes can be used for gastric decompression based on:

- NGT on straight drainage, including aspirates every 4 hours as clinically indicated.
- NGT capped/spigoted, including aspirates every 4 hours as clinically indicated.

The drainage bag should be changed every 24 hours or as required when there is large drainage.

Please note: Enteral tubes placed for decompression or drainage should be flushed every 4 hours.

### Enteral tube flushing

Flushing of enteral tubes with at least **30mL** at minimum<sup>26</sup> of water should be done:

- after aspiration,
- before and after final medication administration\*
- before and after feeding.

\*Flushing between medications can be done with 10-15mL of water.<sup>29</sup>

Patients on continuous feeding should have the enteral tube flushed every 4 hours, including those whose feed is temporarily suspended.

### Procedure

- Pour water into the disposable cup(s).
- Take the enteral syringe and draw up 30mL of water\*.
- Clamp or kink the tube as appropriate. Remove the enteral tube cap/spigot.
- Connect the enteral syringe to the enteral tube.
- Release the tube clamp or kink and gently push the water flush.
- Re-clamp or kink the tube as appropriate.
- Replace the enteral tube cap/spigot.

### To Unblock the Tube:

- For management of blocked intestinal tubes seek medical team advice.<sup>24</sup>
- Liaise with shift coordinator /MO.
- Ensure there are no kinks in the tube.
- Refer to manufacturer's recommendations.
- Decant the sterile water for flushing into the disposable cup.
- Attempt to administer 30-50mL of sterile water down the tube and leave for 20 mins<sup>24</sup>. Do not use a syringe smaller than 50mL to avoid the tube being ruptured with the high pressure of a smaller syringe.<sup>24</sup>
- Alternatively, attempt to aspirate the introduced water immediately and repeat the procedure using gentle push and pull motions until the tube unblocks.<sup>13</sup>
- Consider using warmed water.

Avoid excessive force and use of carbonated beverages (e.g. coke) over water to flush enteral tubes<sup>2</sup>. Acidic liquids such as cranberry juice and colas may precipitate protein in enteral feeds.<sup>24</sup>

If the tube remains blocked liaise with MO. Consider use of a prescribed digestive enzymes products (e.g. Creon<sup>®</sup>).<sup>5,24</sup>

If all of the above are unsuccessful then the enteral tube will need replacing.

### Aspiration

Intestinal tubes e.g. nasoduodenal tube or nasojejunal tube should **not** be aspirated.

Gastric fluid aspiration is used to:

- check placement of the enteral tube on insertion, replacement and prior to feeding
- check gastric residual volume
- reduce vomiting

### Procedure

- Explain procedure to patient.
- Place plastic backed absorbent sheet under the enteral tube.
- If a feed is in progress - stop the feed and flush the tube with at least 30mL of water.
- Connect 50mL enteral syringe to the enteral tube and gently aspirate the tube.
- Disconnect the syringe and occlude the tube with cap/spigot whilst placing gastric contents into the disposable receptacle.
- Test the pH of the aspirate.
- Return aspirates as required.
- Flush the enteral tube with water.
- Disconnect the syringe and ensure the end of the enteral tube is closed to prevent tube leakage or commence feeding if appropriate.
- Dispose of waste according to site based guidelines.
- If there is no aspirate from an NG/NGT, try one or more of the following:
  - Position the patient onto their side
  - Advance the NG/NGT 2-5cm
  - Inject 10-20mL of air using a 50mL syringe
  - Wait 15-30 mins

### Nasal and Oro Tube Removal

Confirm that the feeding tube is to be removed with MO, Speech Pathologist and Dietitian as appropriate.

### Procedure

- Ensure patient privacy
- Explain the procedure to the patient
- Agree on a signal to indicate the patient wishes to stop the procedure
- Position the patient 30-45 degrees head up as clinically indicated
- Place the waterproof protective sheet over the chest.
- Disconnect the drainage bag or feeding administration set as appropriate
- Remove the securing tape
- Gently push 10-20mL of air into the tube
- Cap/spigot the tube or kink it by folding in half according to site based guidelines.
- Ask the patient to take a deep breath while the tube is removed as clinically indicated.
- Remove the tube slowly and evenly over 3 to 6 seconds.

- Clean the nares with tissue and remove residual skin adhesive with adhesive removal wipes.
- Provide mouth care
- Dispose of equipment according to site based policies
- Monitor the patient over 48 hours following removal of the tube for:
  - Nausea and vomiting
  - Abdominal distension
  - Tolerance of food

## Appendix 4: Gastrostomy Tube - Insertion

Perform hand hygiene using the 5 moments



### Pre-Procedure Key Points

- Liaise with MO to ensure appropriate consent has been gained.
- Explain the procedure to the patient and provide education.
- Ensure pre-procedure assessments are complete according to site based protocols e.g. review by specialist nursing staff.
- Ensure management of medications according to site based protocols e.g. prophylactic antibiotics, anticoagulants, hypo-glycaemics.
- Ensure that recent relevant blood tests have been completed e.g. full blood count and coagulation status.
- Ensure the patient has fasted for 6 hours from all oral and enteral feeding and 3-4 hours from liquids.
- Monitor blood glucose levels (BGL) during fasting as clinically indicated.
- Ensure a baseline weight is recorded for the patient.

### Procedure - Percutaneous Endoscopic Gastrostomy (PEG)

- Patient is placed into the left lateral position once in the procedure room.
- A mouth guard is inserted
- The gastroscope is inserted and advanced until it is visualized in the stomach.
- The patient is re-positioned supine and the abdomen exposed for PEG insertion while maintaining privacy and dignity.
- PEG is inserted.
- On completion, MO to document the brand/type and size of tube inserted and the graduated marking visible at skin level in the patient health record.
- Patient is transferred to the recovery area.

### Procedure - Radiologically Inserted Gastrostomy (RIG)

- Ensure intravenous access is patent. Left side preferred.
- Ensure barium is administered the evening before the procedure.

### Confirming position of feeding tubes

**Gastrostomy Tubes** e.g. PEG, RIG - initial placement is confirmed on insertion endoscopically or radiologically and should be re-confirmed radiologically if in doubt.

- Liaise with MO to determine if a chest or abdominal x-ray is indicated for patients when tube placement is in doubt
- Liaise with MO for review of the x-ray to confirm correct placement prior to use. MO to document confirmation of tube placement following x-ray

If the x-ray shows incorrect positioning of the gastric or intestinal tube **do not use it**

### Post-insertion care

- Refer to medical post-operative orders for management of the patient after insertion.
- Correct placement of the gastrostomy tubes are usually confirmed at insertion. Radiological confirmation may be necessary prior to use for some tubes.
- **Do not** rotate pig-tail type radiologically placed gastrostomy tubes.
- A replacement tube must be available on the ward which is of a similar size the gastrostomy tube inserted
- Perform and document vital sign observations.
- Where observations fall outside of appropriate parameters, undertake escalation of care procedures according to site based guidelines.
- Ensure appropriate referrals are made e.g. to stoma nurse, dietitian.
- Assess the insertion site (stoma) by gently lifting the external bumper and observe for bleeding, signs of inflammation/infection, excoriation or leakage.
- Note the amount and type of leakage and volume of blood loss. If excessive leakage (greater than 50mL) is present, liaise with MO.
- Ensure the external tube length is marked and measured from the external bumper to the base of the feeding adaptor so that migration of the tube can be monitored.
- Cross-check the measurement with the measurement on the post-operative orders and liaise with senior staff/MO if there is a difference.
- Check and document the position of the external bumper. Ensure that it is approximately 1cm from the skin with no underlying dressing or compression to the wound.
- Liaise with senior staff/MO if migration of the external bumper occurs or it appears to compress the wound site.
- The patient should take nothing orally for 2 hours or via the tube for the first 4 hours.
- Bowel sounds should be checked for jejunostomy tube insertions. If bowel sounds are not present, liaise with MO and continue fasting the patient, including medications. If bowel sounds are present, flush the tube with sterile water at 4 hours and thereafter according to site based guidelines.
- Nurse 30-45 degrees head up for the water flushes and for 30 minutes afterwards as clinically indicated.
- Medications can be administered from 4 hours. Refer to site based protocols.
- Commence feeding as per dietetic regime the or as per MO orders.
- Flush the tube with 30mL of sterile water pre and post medication/feed.
- Dressings are not routinely required but may be necessary until post-procedure bleeding is stabilised.
- Provide the patient with education and information leaflets according to site based guidelines.

### Commencing feeding post insertion:

- The Surgeon will advise when feeds can commence (usually within 24-48 hours of insertion) depending on the surgical procedure.<sup>26</sup>
- NB: for RIG, the patient must remain nil via RIG for 4 hours unless otherwise specified on the post-operative report.<sup>24</sup>

## Appendix 5: Gastrostomy Tubes – Ongoing Management

Perform hand hygiene using the 5 moments



### Stoma Care

- During the initial post-procedure period, a sterile dressing is only required if there is post-procedure bleeding.
- Clean around the insertion site and under the external flange according to site based guidelines. Sodium Chloride 0.9% is recommended in the post-procedure period and use of soap is not recommended until the insertion site has healed.<sup>21,22</sup>
- Ensure the site dries thoroughly. Leave open to the air.
- If excessive stoma leakage is present, an absorbent foam dressing can be used.

### Securement

- Between 2 and 4 T-fasteners or sutures may be inserted percutaneously to assist with the insertion and securing of radiologically inserted gastrostomy tubes.
- Observe the surrounding skin and dressing at clinically indicated intervals but at least at 24-48 hours after insertion and at 7 days after insertion. Refer to manufacturer's instructions.
- T-fasteners should be removed approximately 2 weeks after insertion with the following procedure:
  - Apply aseptic principles.
  - Clean around the T-fastener with chlorhexidine 1% solution.<sup>34</sup>
  - Lift the T-fastener away from the skin with forceps.
  - Cut the thread at skin level with a stitch cutter or similar.
  - No dressing is required.
  - The remnant of thread left in the stomach will pass naturally.
- Patients discharged prior to removal of T-fasteners should receive information regarding their removal by health care providers in the community.
- Sutures should dissolve in 2-3 weeks. Suture locks should come away freely or may be cut. Liaise with senior/specialist nursing staff/MO.
- Gastrostomy tubes are not routinely secured to the abdomen externally. Agitated patients or those at risk of dislodging their tube may require the tube to be anchored.
  - Use a drain securement device. Refer to manufacturer's information.
  - Alternatively an adhesive non-woven dressing can be used e.g. Fixomull®

## Daily Care

### Do not rotate pig-tail type radiologically inserted gastrostomy (RIG) tubes

- Assess every shift for signs of leakage, inflammation, infection or pain at the stoma site.
- Measure the external tube length and bumper position and record on site based charts.
- Patients with gastrostomy tubes can shower without soap. Ensure the area is dried well afterwards.
- PEG sites should be cleaned daily according to site based guidelines. Allow to dry thoroughly and leave exposed.
- From 2 weeks after insertion, PEG tubes should be rotated 360 degrees. Once suture locks have detached or T-fasteners have been removed, RIG tubes without pigtails should be rotated daily.
- Ensure there is sufficient mobility with the tube to prevent unnecessary trauma.
- Ensure balloon tubes are checked weekly for balloon volume.
- Check the position of the external bumper. It should be approximately 1cm from the skin.
- Liaise with the MO as clinically indicated.
- Perform other specific cares:
  - Perform mouth care every 2 to 4 hours as clinically indicated.
  - Perform oro-pharyngeal suctioning as clinically indicated
  - Patients should be weighed at least weekly or as clinically indicated.

## Troubleshooting

### Leakage around the tube:

- Leakage of gastric/intestinal contents can cause chemical burns to surrounding skin.
- Leakage may occur when:
  - The internal bolster is incorrectly positioned: Check the external length of the tube. Gently pull the internal portion of the tube until resistance is felt then secure to prevent displacement. Check tube markings.
  - Buried flange: Ensure the external bumper is no more than 1cm from the skin. Try to rotate and advance the gastrostomy tube.
  - The balloon is deflated: Check the volume of water and compare to volume instilled.
  - There is backflow of formula. Ensure the patient is positioned semi-upright as clinically indicated or liaise with the dietitian regarding slower rate of feeding or continuous feeding.

### Pain during feeding/flushing through the gastrostomy tube

- May suggest mal-positioning of the tube and/or leakage of gastric/intestinal contents into the peritoneal space.
- Notify the MO.

### Administration of water

Refer to Appendix 3: Management of Nasal and Oro Tubes – [Administration of water](#) section

### pH Testing Procedure

- Explain procedure to patient
- Ensure patient privacy
- Arrange plastic backed absorbent pad under the tube port
- Open the cap/spigot on the enteral tube and attach enteral syringe
- Aspirate 0.5-1mL of fluid
- Disconnect the enteral syringe and immediately replace cap/spigot
- Place a few drops of aspirate onto the pH indicator strip and wait 10 seconds
- Match the colour change of the strip with the colour code on the box to identify the pH of the aspirate
- pH less than 5.5 indicates an acid reaction and that the tube is probably placed in the stomach.
- If pH is 5.5 or greater liaise with MO/Pharmacist.

### Enteral tube flushing

Flushing of enteral tubes with at least **30mL** at minimum<sup>26</sup> of water should be done:

- after aspiration,
- before and final medication administration\*
- before and after feeding

\*Flushing between medications can be done with 10-15mL of water<sup>29</sup>.

### Procedure

- Pour water into the disposable cup(s).
- Take the enteral syringe and draw up 30mL of water\*.
- Clamp or kink the tube as appropriate. Remove the enteral tube cap/spigot.
- Connect the enteral syringe to the enteral tube.
- Release the tube clamp or kink and gently push the water flush.
- Re-clamp or kink the tube as appropriate.
- Replace the enteral tube cap/spigot.

### Flushing the PEG tube<sup>24</sup>:

- Commence first flush 2 hours post-insertion. Feeds can commence 2 hours post flush (i.e. 4 hours post insertion) unless specified by Surgeon.
- The volume used to flush will depend on lumen size of tube e.g. 14Fr – 20mL, 20Fr - 60mL
- Flush tube prior to each feed, and both pre and post medication administration

**Flushing the RIG tube<sup>24</sup>:**

- Commence first flush the day after insertion, following confirmation of placement
- Use enteral syringe to flush tube with 30mL of water before and after each feed and medication administration

**Unblocking the tube and enteral tube aspiration**

Refer to Appendix 3: Management of Nasal and Oro Tubes for [Unblocking the tube](#) and [Enteral tube aspiration](#).

Intestinal tubes e.g PEJ, RIJ tube should not be aspirated.

## Appendix 6: Gastrostomy Tube Replacement Guideline

### Key Points

Assess for flange type. Some-gastrostomy tubes can only be removed endoscopically or by trained staff. Liaise with senior/specialist nurse or MO. Refer to manufacturer's instructions.

- Perform hand hygiene using the 5 moments 
- Medical and nursing staff performing gastrostomy tube removal and changes must have appropriate training<sup>1</sup>. Refer to site based guidelines.
- A Gastrostomy tube is not routinely changed and may remain in-tact for up to 2 years if viable.
  - Tubes should not be changed until the stoma tract is completely healed or at least 6 weeks after placement.
- Tubes can be replaced under fluoroscopy by request of MO.
- A replacement tube must be available on the ward which is of a similar size to the gastrostomy tube inserted.
  - Normally 18-20french gauge or Foley 16-18french gauge.
- For patients taking anti-coagulant medication, check the international normalized ratio (INR) prior to removal of gastrostomy tubes requiring traction.
- If the patient is deceased, the gastrostomy tube should remain in-situ unless removal is ordered by MO.

### Pre-Procedure

- Fast the patient for 6 hours prior to the procedure.
- Cease anti-coagulant therapy at the clinically appropriate time.
- Explain the procedure to the patient and gain appropriate consent.

### Procedure

- Position the patient in a comfortable reclined or supine position as clinically indicated.
- Use aseptic non-touch technique. Ensure PPE according to site based protocols.
- Open the sterile dressing pack and place equipment on the sterile field.
- Prepare the new tube for insertion:
  - Remove from the packaging
  - Check the balloon by inflating/deflating
  - Lubricate the end of the tube
  - Ensure the external flange is withdrawn up into the tube.

## Removal of the Gastrostomy Tube

### Initial tube with bumper:

- Note the position of the external flange on the old tube prior to removal.
- Open the end of the gastrostomy tube.
- Ensure the tube is mobile in the tract with adequate movement for manipulation.
- Clean the stoma with chlorhexidine 1% solution and allow to dry.<sup>34</sup>
- Hold the gauze dressing over the opening to absorb any fluid.
- Using one hand, grip the tube. Place the other hand on the abdomen surrounding the stoma.
- Using counter traction, gently but firmly pull the existing tube out.
- Liaise with the MO/Senior Nurse if the tube is difficult to remove.

### Replacement tube with balloon:

- Open the end of the gastrostomy tube.
- Ensure the tube is mobile in the tract with adequate movement for manipulation.
- Clean the stoma with chlorhexidine 1% solution and allow to dry.<sup>34</sup>
- Deflate the balloon fully.
- Hold the gauze dressing over the opening to absorb any fluid.
- Using one hand, grip the tube. Place the other hand on the abdomen surrounding the stoma.
- Using counter traction, gently but firmly pull the existing tube out.
- Liaise with the MO/Senior Nurse if the tube is difficult to remove.

If the gastrostomy is no longer clinically indicated:

- Clean the stoma again with chlorhexidine 1% solution and allow to dry.<sup>34</sup>
- Apply a dry dressing to the stoma and dress daily
- Observe for ooze or excessive exudate
- Liaise with MO/Senior Nurse as appropriate
- Provide dressings and education for discharge as appropriate. Refer to site based guidelines.

## Replacement Tube Insertion

- Insert the new lubricated tube into the stoma approximately 5-6cm beyond the previous flange position to avoid obstructing the gastric outlet or the stoma.
- Inflate the balloon with sterile water. Refer to manufacturer's instructions.
- Gently tug the tube to ensure the balloon is inflated and secure.
- Push the external flange down the tube towards the abdomen.
- Leave a 1cm gap between the bumper and the skin.
- Aspirate the gastrostomy tube and check pH to confirm correct tube placement prior to use.
- If unsure of tube placement, **do not use**. Liaise with MO.
- A follow-up pegogram may be indicated.
- Monitor the site daily for signs of bleeding, infection or leakage.

### Balloon Integrity Check

This procedure is only to be performed on replacement tubes.

Some radiologically inserted (RIG) tubes and initial PEG tubes do not have balloons. Refer to manufacturer's information.

The maximum volume of the balloon must not exceed the manufacturer's instructions

**Do not** use air to inflate the balloon.

- Refer to manufacturer's instructions for the frequency and procedure for balloon integrity check.
- Check the documented volume instilled in the balloon at the time of insertion.
- Stabilise the tube and carefully remove fluid from the balloon with a syringe.
- Check the volume removed corresponds with the volume instilled at insertion.
- If the volumes correspond, re-instil the water into the balloon. If the volume is less than the original, instil additional fluid until the desired volume is reached.
- Liaise with MO/Senior Nurse if there are significant discrepancies between volume checks which may suggest balloon leakage.
- The tube will require replacement if the tube is not intact.

### Dislodged Gastrostomy Tubes

Dislodged gastrostomy tubes must be attended to immediately.

- Liaise with MO to manage the patient's immediate need for hydration while awaiting tube replacement.
- If a gastrostomy tube appears to be dislodged but still in the gastrostomy tract, resecure it. Contact the radiology registrar to discuss.
- If a gastrostomy tube appears to be dislodged from the tract, a tube of the same size should be inserted immediately or at least within 1 hour to maintain the tract patency. Liaise with MO/Senior or Specialist Nurse.
- If a replacement gastrostomy tube is not available, temporarily insert a Foley urinary catheter of similar size and arrange for a planned gastrostomy tube re-insertion by an experienced staff member within 72 hours.
- Do not use a temporary tube until placement is confirmed.
- If a gastrostomy tube is not able to be replaced, liaise with Medical Officer
- Ensure adequate follow-up is in place by specialist medical/nursing staff for patients discharged from Emergency or short stay wards following replacement of dislodged gastrostomy tubes.

## Appendix 7: Administration of Enteral Formulas

Immunocompromised and postpylorically fed patients require freshly opened sterile water for: Enteral tube flushing, aspiration and/or medication administration.

### Pre-Procedure Key Points

- Perform hand hygiene using the 5 moments 
- Explain the procedure to the patient/significant other(s)/NOK.
- Confirm the feeding regimen as documented by the Dietitian/MO on MR602.1.10 WACHS Adult Enteral Feeding Form
- Refer to site based guidelines for the storage of enteral feeding solutions.
- Time and date to be documented on the feed container.
- All feeds to be discarded on the expiry date.
- All duodenal and jejunum feeds must be administered continuously by pump.
- Ensure the formula is at room temperature. Remove from refrigeration 30 minutes prior to use.
- Refer to manufacturer's information for the correct use of feeding delivery systems.
- Patients to be nursed with the head of the bed elevated by 30–45° as clinically indicated during feeding to reduce the risk of aspiration.<sup>20</sup>
- Maintain this position for at least 30-60 minutes after the feed.

### Equipment Required:

- Feeding regimen documented from dietitian
- Gravity feeding set (if feeding by delivery set)
- Pump feeding delivery set (as required)
  - For pre-filled ready to hang bags
  - Open system for cans, tetras, bottles or modular feed in jugs
- Enteral feeding pump
- Prescribed feeding formula
- Clean receptacle for the aspirate
- pH testing strips
- Waterproof protective sheeting
- Disposable cup
- 60mL enteral syringe
- Water: Refer to [Administration of water](#).

### Feeding via Enteral Syringe:

- Check nasally orally inserted gastric tube placement if feeding through this.
- Measure gastric residual volume for tubes placed in the stomach.
- The syringe can be attached to the feeding tube with the barrel removed and the tube clamped/kinked.<sup>12</sup>
- Flush the enteral tube with water.
- Pour the feeding solution into the barrel of the syringe.
- Release the cap, clamp or kink to allow the feed to flow through the tube using gravity.
- Cap, clamp or kink the tube and repeat the procedure of administering the feeding solution until the prescribed amount has been delivered.
- Flush the tube again with 30mL of water.
- Clamp or kink the tube.
- Replace the cap/spigot.
- Dispose of equipment according to site based policies.

### Feeding via Gravity Set

- Feeding sets should be assembled on a clean, dry surface away from the patient bed area.
- Place the plastic backed absorbent sheet under the enteral tube.
- Check gastric tube placement.
- Measure the gastric residual volume for tubes placed in the stomach.
- Prepare the delivery set and formula delivery device. Refer to manufacturer's instructions.
- Ensure no part of the feeding set container that comes into contact with the feeding formula is touched.
- Fill the feeding bag with the prescribed bolus volume. Label the bag according to site based guidelines.
- If feeding bottles are being used. Ensure details are correct on the bottle.
- Flush the enteral tube with water.
- Consider additional water if hydration required. Liaise with the shift coordinator.
- Cap, clamp or kink the tube and attach the delivery set. Ensure it is secure.
- Administer the feed regulated by the gravity feeding set.
- Following the feed, flush the tube again with water.
- Disconnect the delivery set and re-cap/spigot the tube.
- Discard equipment according to site based policies.

### Continuous Feeding via Pump Set

- Check nasally orally inserted gastric tube placement if feeding through this.
- Flush the enteral tube with 30mL of water.
- Insert the pump feeding set into the pump according to manufacturer's instructions.
- Connect the pump delivery set line to the feeding tube. Ensure it is secure.
- Ensure the line is primed prior to connection to the patient
- Administer feed according to the regimen prescribed.
- Flush gastrostomy tubes situated in the jejunum (PEJ) every 2-4 hours during continuous feeding with a 50-60mL enteral syringe
- NGT and OGT should be aspirated and flushed every 4 hours to check GRV.
- Notify the dietitian of any significant unscheduled stop in feeding.
- Consider pH testing of gastric aspirate from an NG/NGT following prescribed breaks and prior to feeding set change/recommencement of feeding. Wait until at least 1 hour after the feed has stopped.
- Feeding sets must be changed a minimum of once each day.
- Ready to hang (RTH) feeds are closed systems and can be hung at room temperature for up to 24 hours. Change the feeding set each time a new pre-filled RTH feed is used.
- For other feeds e.g. can, tetrapak, modular (Jugs), place a maximum of 4 hours of feed in the feeding bag and only top up the feeding bag set when it is almost empty. Label the feeding bag with feed strength, rate, date and time. Re-label the feeding bag if a rate change is prescribed.
- NGT placement is checked at a minimum every 24 hours for patients on continuous feeds. Also check prior to medication administration and re-commencement of feeds.
- Liaise with Clinical Pharmacist for liquid preparations where possible, or alternative medication suitable for crushing<sup>19</sup>

## Appendix 8: Administration of Medications

### General Principles

- Refer to WACHS Medication Administration Policy
- Refer to [Medication Administration Algorithm](#)
- Refer to the [Australian Don't Rush to Crush](#) for guiding principles, reasons not to crush, medications that must not be crushed, work health and safety implications, legal implications and decision making process related to administration medicines to people who have difficulty swallowing or cannot swallow medicines
- Ensure to follow the rights of medication administration
- Perform hand hygiene using the 5 moments 

### Nursing Alerts

Only use purple oral/enteral syringes that cannot be connected to IV catheters or ports to administer oral liquid medications<sup>25</sup>. Refer to the ACSQHC [National Standard for User-applied Labelling of Injectable Medicines, Fluids and Lines](#)

If unsure of placement **do not use** the enteral tube for feeding or medication administration. Notify Senior Nurse/ Medical Officer for review and advice.

- The enteral tube must be checked to confirm correct placement in the stomach or small intestine prior to first use and after replacement.
- Nasally and orally inserted gastric tubes must be checked to confirm correct placement in the stomach prior to each use.
- Following initial placement of a gastrostomy, correct location is confirmed during the procedure.
- Check the gastrostomy tube length for migration prior to each feed, water flush or medication administration.

### Consider alternative route for medication

- Consider alternative routes for medications and use liquid preparations where possible.<sup>11</sup>
- Flush the enteral tube with at least 30mL of water before and after the final medication administration.<sup>24</sup> Flush 10-15mL between medications.
- **Do not** add medications to feeding formula.<sup>3</sup> Liaise with the Pharmacist.

### Consider form of medication

- Use liquid preparations as available. Liquid form is preferable to solid form to reduce the risk of tube occlusion and reduces drug preparation times.<sup>25</sup>
- For fine bore intestinal tubes (naso-duodenal/naso-jejunal, jejunostomy), liaise with the Pharmacist for appropriate medication preparation to prevent clogging e.g. liquid form preferred.

- Some medications are not designed to be crushed (refer to [Australian Don't Rush to Crush](#)). Liaise with Pharmacist/ Senior Staff for:
  - Buccal or sublingual medications
  - Enteric coated medications
  - Slow release medications
  - Hormone preparations
  - Cytotoxic medications
  - Proton pump inhibitors
- Consider sugar and sodium content in some liquids/soluble forms.
- Consider the amount of fluid given to patients on fluid restriction.
- For patients with an gastric tube on straight drainage:
  - Liaise with the Pharmacist, Dietitian and/or MO regarding cessation of feed prior to specific medications.
  - Clamp/spigot the tube for at least 30 minutes after administration of the drug.

### Pharmacological principles

- If more than one medication is prescribed to be administered at the same time:
  - Prepare each medication individually
  - Flush between each medication with 10-15mL of water.<sup>26</sup>
- Consider drug interactions and drug/nutrient interactions.
- Liaise with Pharmacist for the following<sup>24</sup>:
  - Medications that interact with feeding formula.
  - Interruption of feeding for medications that are administered via the enteral tube.
  - Medications to be taken on an empty stomach.
  - Enteral tube compatible formulations of medications.

### Equipment Required:

- medication chart
- pH test strips
- 50mL enteral syringe or 60mL for gastrostomy tubes
- Clean pill crusher or mortar and pestle
- Disposable cup(s)
- Water: Refer to [Administration of water](#).
- Disposable receptacle for equipment
- Plastic-backed absorbent sheet
- Sterile scissors/blade

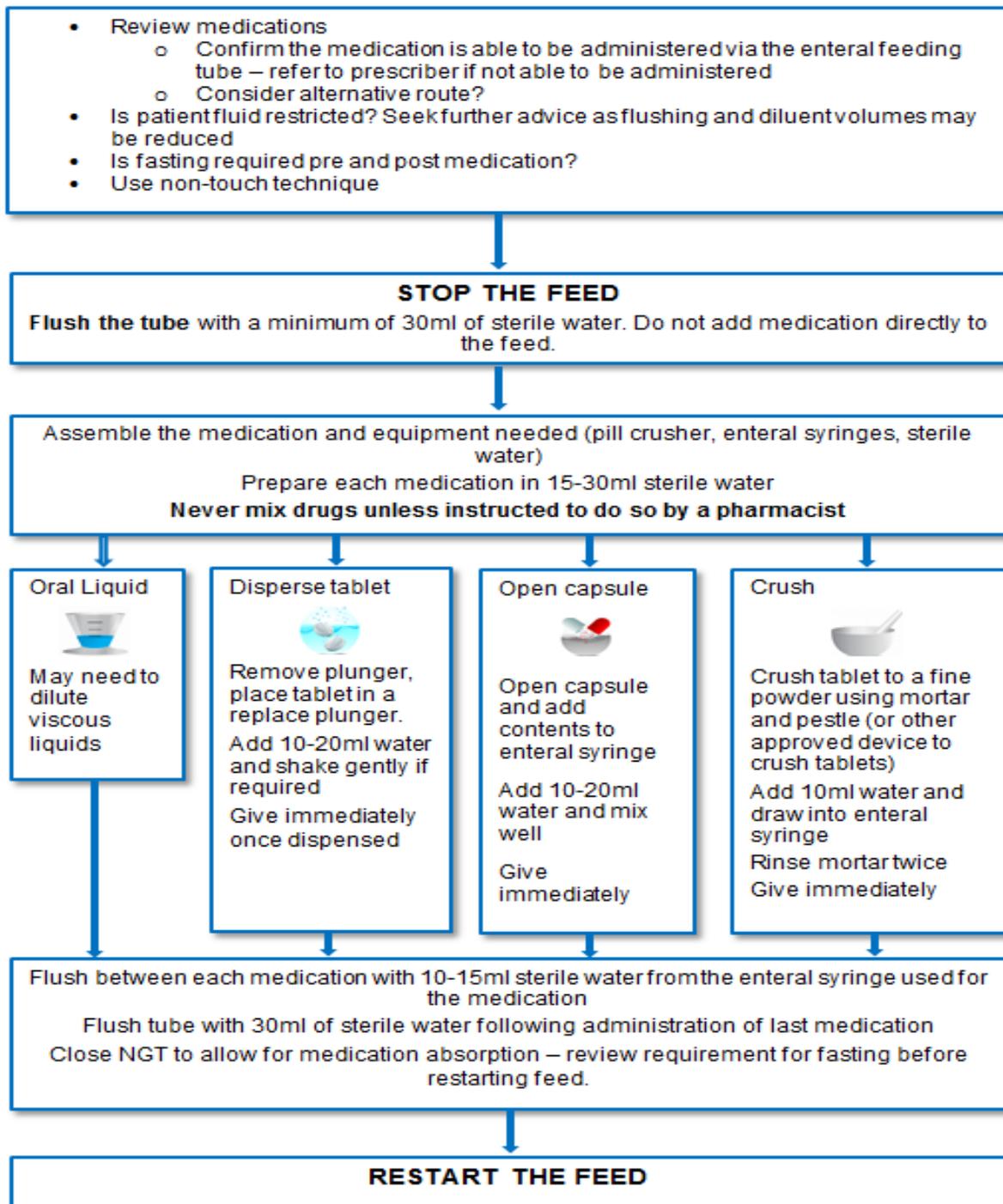
### Procedure:

- Explain the procedure to the patient and gain appropriate consent
- Position the patient comfortably with their head raised 30-45 degrees as clinically indicated.
- Pour water into the disposable cup(s).
- Check nasally/orally inserted gastric tube placement if administering medication through this.
- Prepare the prescribed medication for administration (according to instructions in [Don't Rush to Crush](#) or from pharmacist).
- Flush the enteral tube with 30mL of water.
- Draw up the prepared diluted medication into the enteral syringe, promote mixing.
- Release the cap, clamp or kink and administer the medication by gentle push.
- Re-place the cap, clamp or kink the enteral tube and disconnect the enteral syringe.

If multiple medications are administered, flush the enteral tube with 10-15mL of water between each

- Perform the post medication administration flush.
- Dispose of equipment appropriately.
- Clarify if fasting is required following medication administration before re-starting the feed.
- Ensure documentation is complete.

### Medication Administration Algorithm



## Appendix 9: Gastric Residual Volume (GRV)



- Perform hand hygiene using the 5 moments
- Is routinely measured to monitor:
  - Gastric tolerance to intermittent or bolus enteral feeding
  - Abdominal decompression and drainage for patients not receiving enteral feeding.
- Volumes below are a guide only and individual patient characteristics and enteral feeding regimens should be taken into account.
- For management of GRV for continuous feeding, refer to [Continuous Feeding via Pump Feeding Delivery Set](#) section.
- Refer to Appendix 3 Management of Naso and Oro Tubes: [Enteral Tube Aspiration](#) section.

GRV	Action
<b>Less than 150mL</b>	<ul style="list-style-type: none"> <li>• Note the aspirate on fluid balance chart</li> <li>• Return the aspirate.</li> <li>• Flush the tube with 30mL water.</li> <li>• Continue feeding.</li> <li>• Ensure the patient is nursed at 30-45 degrees head up as clinically indicated.</li> </ul>
<b>150-250mL</b>	<ul style="list-style-type: none"> <li>• Note the aspirate on fluid balance chart</li> <li>• Return the aspirate.</li> <li>• Flush the tube with 30mL water.</li> <li>• For <b>bolus</b> enteral feed, deduct the aspirate volume from next feed</li> <li>• For <b>continuous</b> enteral feed, continue feed as charted</li> <li>• Ensure the patient is nursed at 30-45 degrees head up as clinically indicated.</li> </ul>
<b>250mL to 500mL on 2 or more consecutive occasions</b>	<ul style="list-style-type: none"> <li>• Note the aspirate on fluid balance chart</li> <li>• Return the aspirate.</li> <li>• Flush the tube with 30mL water</li> <li>• For <b>bolus</b> enteral feed, deduct the aspirate volume from next feed</li> <li>• For <b>continuous</b> enteral feed, continue feed as charted</li> <li>• Ensure the patient is nursed at 30-45 degrees head up as clinically indicated.</li> <li>• Monitor closely for signs of abdominal distension, fullness, nausea, cramping and vomiting</li> <li>• Liaise with MO and dietitian</li> <li>• Consider medications to enhance gastric motility.</li> </ul>

Table 5: Actions related to Gastric Residual Volume amounts<sup>30,31,32</sup>

Table 5 continues over page

GRV	Action
500mL or above	<ul style="list-style-type: none"> <li>• Note the aspirate on fluid balance chart</li> <li>• Ensure the patient is nursed at 30-45 degrees head up as clinically indicated</li> <li>• Monitor closely for signs of abdominal distension, fullness, nausea, cramping and vomiting.</li> <li>• Liaise with MO and dietitian</li> <li>• Consider medications to enhance gastric motility</li> <li>• Withhold the feed for 1 hour then recheck GRV;</li> <li>• If after 1 hour the aspirate is less than 500mL refer to actions in sections above</li> <li>• If after 1 hour the aspirate is greater than 500mL:               <ul style="list-style-type: none"> <li>○ Discard the aspirate</li> <li>○ Withhold the feed for 4 hours</li> <li>○ Recheck GRV</li> <li>○ Monitor closely for signs of abdominal distension, nausea and vomiting</li> <li>○ Liaise with MO</li> </ul> </li> <li>• Consider medications to enhance gastric motility.</li> <li>• Liaise with dietitian to discuss alternative feeding options e.g. reduced feeding rate or pump feeding.</li> </ul>

Table 5: Actions related to Gastric Residual Volume amounts<sup>30,31,32</sup>

## Appendix 10: Adult After Hours Enteral Feeding Regimen<sup>1-3, 27,28</sup>

Perform hand hygiene using the 5 moments



### Indications

For patients 18 years and over, who are:

- Unsafe for oral intake following completion of MR64B Dysphagia Screening Tool (Royal Brisbane Women's Hospital [RBWH]) or awaiting Speech Pathologist review.
- Medically requires temporary provision of nutrition and hydration.
- Unable to meet nutritional needs orally.

### Contraindications

- Gut failure, intestinal obstruction.
- Inability to gain enteral access.
- Palliative conditions - quality of life, possible complications and potential benefits should be considered and discussed with the patient and the patient's significant other(s) / next of kin (NOK).

### Refeeding Syndrome

Refeeding syndrome is a set of metabolic disturbances which can arise when a malnourished or starved patient is fed (orally, enterally or parenterally) and may cause serious clinical complications.

MO must identify and manage those patients at risk of refeeding syndrome before and during tube feeding. Refer WACHS Refeeding Clinical Guideline (in development).

### Procedure – Medical Officer

- Refer patient to a Dietitian
- Estimate the patient's daily fluid requirement
- Titrate with intravenous therapy to meet the patient's estimated daily fluid requirements as required
- Monitor patient's biochemistry, including:
  - FBC, LFTs, Urea and electrolytes; creatinine;
  - Phosphate; magnesium; and corrected calcium.
- Chart supplements as required to prevent re-feeding syndrome (refer to Refeeding Clinical Guideline [in development])
- Confirm correct placement of enteral tube in the stomach prior to its first use.
- If diabetic patient, manage blood sugars and insulin appropriately

Commence using **Pump Regimen**. Consider **Bolus Regimen only** if no pump available.

**Procedure for feeding**

- Patient’s head and shoulders should be elevated 30 -45 degree about chest level during and for 30 – 60 minutes after completion of feed.
- Nursing staff to monitor tolerance of feeds:
  - Commence fluid balance chart and review bowel outputs
  - Check gastric residuals every 4 hours during the first 48 hours for those on pump regimen. Refer to [Gastric Residual Volume \(GRV\)](#) section.
  - Request review by Medical officer if signs of poor toleration such as abdominal discomfort, firmness, distension, nausea, vomiting, frequent hiccups, recurrent aspiration > 500mL.
  - BSL 4hrly or as directed by MO
- Follow Stage 1 for the first 24 hours of feeding and progress to Stage 2 if tolerating and not at risk of refeeding syndrome.
  - For those at risk of refeeding syndrome continue Stage 1 or as per Medical Officer orders or until Dietitian can review
- If at any stage the feeding regimen is not tolerated, return to the previous stage and inform the Medical Officer.

**Dietitian Review**

Dietitian to review the patient and feeding regime on the next working day to determine individualised feeding regime.

**Continuous Pump Regimen** – suitable for NGT and PEG: using 1 cal/ml no fibre feed

Feeding Period	Stage 1	Stage 2
Formula	1 (cal/mL)	1 (cal/mL)
Feeding Period	20hrs (4hr break)	20hrs (4hr break)
Feed Rate (mL/hr)	30 mL/hr	50 mL/hr
Water Flush (mL)	50 every 4hrs	100 every 4hrs
Total Formula	600mL	1000mL
Total water flush	300mL	600mL
<b>Total Fluid (mL)</b>	<b>900mL</b>	<b>1600mL</b>
Total Energy (kj)	2520	4200
Total Protein (g)*	22-24	38-40
Sodium (mMol)*	19-25	33-43
Potassium (mMol)*	19-23	32-38
<ul style="list-style-type: none"> <li>• If patient is at risk of refeeding syndrome, continue on Stage 1 until Dietitian review.</li> <li>• If the patient is not at refeeding risk, continue to Stage 2.</li> <li>• Continue regimen until reviewed by Dietitian</li> <li>• * range based on formula used</li> </ul>		

**Bolus Regimen** - suitable for NGT and PEG where no pump available: Using 1 cal/mL no fibre feed

Feeding Period	Stage 1	Stage 2
Formula	1 (cal/mL)	1 (cal/mL)
Delivery	Syringe / gravity	Syringe / gravity
Feeding Volume (mL)	50	100
Frequency	2hrly x 10 (4hr break)	2hrly x 10 (4hr break)
Water Flush (mL)	50 pre and post bolus	50 pre and post bolus
Total Formula	500mL	1000mL
Total water flush	1000mL	1000mL
<b>Total Fluid (mL)</b>	<b>1500mL</b>	<b>2000mL</b>
Total Energy (kj)	2100	4200
Total Protein (g)*	19-20	38-40
Sodium (mMol)*	16-21	33-43
Potassium (mMol)*	16-18	32-38
<ul style="list-style-type: none"> <li>• If patient is at risk of refeeding syndrome, continue on Stage 1 until Dietitian review.</li> <li>• If the patient is not at refeeding risk, continue to Stage 2.</li> <li>• Continue regimen until reviewed by Dietitian</li> </ul> <p>* range based on formula used</p>		

**Please note:** these regimes are not suitable for NJF/PEJ tubes.

**Continuous Pump Regimen** – suitable for NJT and PEJ: using 1 cal/mL no fibre feed

Feeding Period	Stage 1	Stage 2
Formula	1 (cal/mL)	1 (cal/mL)
Feeding Period	20hrs (4hr break)	20hrs (4hr break)
Feed Rate (mL/hr)	30 mL/hr	50 mL/hr
Water Flush (mL)	50 every 4hrs	100 every 4hrs
Total Formula	600mL	1000mL
Total water flush	300mL	600mL
<b>Total Fluid (mL)</b>	<b>900mL</b>	<b>1600mL</b>
Total Energy (kj)	2520	4200
Total Protein (g)*	22-24	38-40
Sodium (mMol)*	19-25	33-43
Potassium (mMol)*	19-23	32-38

- If patient is at risk of refeeding syndrome, continue on Stage 1 until Dietitian review. If the patient is not at refeeding risk, continue to Stage 2.
  - Continue regimen until reviewed by Dietitian
- \* range based on formula used

Examples of 1 cal/mL, no fibre, lactose and gluten free formulas (all suitable for diabetics) to use:

- Fresubin Original (1000mL RTH)
- Nutrison (1000mL RTH)
- Glucerna Select (low carbohydrate)

The following oral sip supplements are 1 cal/mL can be used (no fibre, gluten free)

- Sustagen liquid
- Resource protein

## Appendix 11: Home Enteral Nutrition

The main indications for home enteral nutrition are:

- Impaired ability to ingest nutrients/swallowing disorders
- Specialised nutrition requirements
- Impaired digestion and absorption of nutrients

Patients must be assessed by a dietitian as requiring ongoing enteral nutrition at home.

Adequate time should be allowed in the hospital setting for patients to become fully educated for home enteral feeding.<sup>16</sup>

### Patient/carer education

Patients should be competent to demonstrate the following prior to discharge<sup>17</sup>:

- Checking tube position including external length check.
- pH testing for naso-gastric tubes (NG/NGT).
- Preparation of the feed including checking expiry dates, shaking the solution, handling of equipment.
- Hand hygiene practices.
- Water flushes post feeding/medication.
- Correct administration of medications.
- Skin care around the insertion site and securing of the tube.
- Cleaning and storage of equipment
- Storage of feeds
- Understanding of the feeding regimen prescribed by the Dietitian.

### Discharge into the community

Prior to discharge the following is required to ensure successful transition to delivery of enteral feeding in the community setting:

- Refer to home based nursing services as appropriate.
- MO to liaise with general practitioner.
- Ensure arrangements are in place for the provision of equipment and nutritional products for enteral feeding.<sup>15</sup>
- Dietitian to register with current HEN processes.
- Written resources should be provided regarding care of the tube, removal of T-fasteners as appropriate, and the final feeding regime once clarified.<sup>8</sup>
- Ensure follow-up clinical review is arranged for the patient where indicated as an outpatient or in the community where available.

## Appendix 12: Potential Problems Associated with Enteral Feeding

Consider any food allergies/ sensitivities prior to commencement of feeding regimens. Liaise with Dietitian for appropriate feeds.<sup>2</sup>

Problem	Cause	Considerations
<b>Aspiration</b>	<ul style="list-style-type: none"> <li>• Reflux or vomiting</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce feed rate or slow progression to target rate, avoid bolus feeding</li> </ul>
	<ul style="list-style-type: none"> <li>• Sub-optimal patient positioning</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure upright position (more than 30 degrees) where possible during and after feeding for at least 30 minutes</li> </ul>
	<ul style="list-style-type: none"> <li>• Physical agitation e.g. while transferring</li> </ul>	<ul style="list-style-type: none"> <li>• Stop feeding at least 30 minutes prior to mobilisation or vigorous activity</li> </ul>
	<ul style="list-style-type: none"> <li>• Tube dislodgement</li> </ul>	<ul style="list-style-type: none"> <li>• Check tube position regularly</li> </ul>
	<ul style="list-style-type: none"> <li>• Medications e.g. anti-psychotics, anti-cholinergics.</li> </ul>	<ul style="list-style-type: none"> <li>• Review medications</li> </ul>
	<ul style="list-style-type: none"> <li>• Other e.g. neurological disorders, altered conscious level.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify risk factors.</li> </ul>
<b>Blocked feeding tube</b>	<ul style="list-style-type: none"> <li>• Irregular tube flushing</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to <a href="#">Appendix 3: Enteral Tube Flushing</a></li> </ul>
	<ul style="list-style-type: none"> <li>• Concentrated or fibre-enhanced formula</li> </ul>	<ul style="list-style-type: none"> <li>• Flush the tube before and after each feed or every 4 hours during continuous feeding.</li> <li>• Flush before and after checking aspirates.</li> </ul>
	<ul style="list-style-type: none"> <li>• Incorrect administration of medications</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to <a href="#">Appendix 8: Administration of Medications</a></li> </ul>
	<ul style="list-style-type: none"> <li>• Feeding tube deterioration or kinking/ twisting</li> </ul>	<ul style="list-style-type: none"> <li>• Confirm tube positioning with X-ray as required.</li> <li>• Re-position the NG or replace the NG/NGT. Liaise with MO.</li> </ul>
<b>Constipation</b>	<ul style="list-style-type: none"> <li>• Inadequate fluid</li> </ul>	<ul style="list-style-type: none"> <li>• Liaise with the team. Review requirements and monitor intake and output. Consider extra flushes.</li> </ul>
	<ul style="list-style-type: none"> <li>• Inadequate fibre</li> </ul>	<ul style="list-style-type: none"> <li>• Consider fibre enriched formula or fibre supplementation.</li> </ul>
	<ul style="list-style-type: none"> <li>• Disruption of usual diurnal cycle of food and activity, toileting privacy.</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss with the team. Optimise mobility and attention to privacy.</li> </ul>
	<ul style="list-style-type: none"> <li>• Medications e.g. analgesics</li> </ul>	<ul style="list-style-type: none"> <li>• Review medications. Consider a bowel management plan with laxatives.</li> </ul>
	<ul style="list-style-type: none"> <li>• Gastro-intestinal obstruction</li> </ul>	<ul style="list-style-type: none"> <li>• Cease feeding and refer to medical team if obstruction is suspected.</li> </ul>

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## WACHS Enteral Feeding Clinical Practice Standard

Problem	Cause	Considerations
<b>Dehydration</b>	<ul style="list-style-type: none"> <li>Inadequate fluid intake</li> <li>Excessive fluid loss</li> </ul>	<ul style="list-style-type: none"> <li>Review fluid requirements and monitor fluid balance</li> <li>Consider extra/larger flushes or intravenous fluids.</li> <li>Consider changing to a less concentrated formula</li> </ul>
<b>Delayed gastric emptying</b>	<ul style="list-style-type: none"> <li>Illness</li> <li>Post-surgical stress response</li> </ul>	<ul style="list-style-type: none"> <li>Assess tolerance with aspirate volume, abdominal distension, discomfort and nausea/fullness. Refer to <a href="#">Appendix 3: Enteral Tube Aspiration</a>.</li> <li>Consider post-pyloric feeding or pro-kinetics.</li> </ul>
	<ul style="list-style-type: none"> <li>Hyperglycaemia</li> </ul>	<ul style="list-style-type: none"> <li>Monitor Blood Glucose Levels (BGL).</li> </ul>
	<ul style="list-style-type: none"> <li>Medications</li> </ul>	<ul style="list-style-type: none"> <li>Review medications</li> </ul>
	<ul style="list-style-type: none"> <li>Gastro-intestinal obstruction</li> </ul>	<ul style="list-style-type: none"> <li>Refer to team and cease feeding if obstruction is suspected.</li> </ul>
<b>Diarrhoea</b>  <b>Note:</b> Determine timing of diarrhoea in relation to time of change of feed type	<ul style="list-style-type: none"> <li>Antibiotics</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian</li> <li>Consider probiotic supplements</li> </ul>
	<ul style="list-style-type: none"> <li>Medications</li> </ul>	<ul style="list-style-type: none"> <li>Review medications. Withhold laxatives.</li> </ul>
	<ul style="list-style-type: none"> <li>Fibre content of formula</li> </ul>	<ul style="list-style-type: none"> <li>A fibre free feed or lower fibre content feed may be indicated (if previously on high fibre feed)</li> <li>Inclusion of fibre content in feed may resolve diarrhoea</li> </ul>
	<ul style="list-style-type: none"> <li>Bolus feeding or rapid administration</li> </ul>	<ul style="list-style-type: none"> <li>Use continuous administration or slower rate over a longer time</li> </ul>
	<ul style="list-style-type: none"> <li>Feed administered too cold</li> </ul>	<ul style="list-style-type: none"> <li>Let the formula stand at room temperature for 30 mins prior to use</li> </ul>
	<ul style="list-style-type: none"> <li>Hyperosmolar formula</li> </ul>	<ul style="list-style-type: none"> <li>Some patients may be sensitive. Check medication osmolality</li> <li>Consider iso-osmolar feed</li> </ul>
	<ul style="list-style-type: none"> <li>Malabsorption</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the need for pancreatic enzyme replacement if indicated</li> </ul>
	<ul style="list-style-type: none"> <li>Bacterial contamination</li> <li>Overflow diarrhoea (constipation)</li> </ul>	<ul style="list-style-type: none"> <li>Adhere to hygiene precautions and hang time. Avoid adding to the feed.</li> <li>Check for impaction, confirm as clinically indicated with rectal exam/x-ray<sup>2</sup></li> </ul>
<b>Fluid overload</b>	<ul style="list-style-type: none"> <li>Excessive fluid intake</li> <li>Compromised renal or cardiac function</li> </ul>	<ul style="list-style-type: none"> <li>Review all fluid volume received including: oral and intravenous fluids, medications and flushes. Liaise with MO and titrate fluid volume accordingly.</li> <li>Consider smaller flushes.</li> <li>Consider changing to a more concentrated formula.</li> <li>Document regular weight measurements. Liaise with the team.</li> </ul>

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## WACHS Enteral Feeding Clinical Practice Standard

Problem	Cause	Considerations
<b>Nausea and vomiting</b>	<ul style="list-style-type: none"> <li>Fast delivery rate/overfeeding/large bolus</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the feed rate, reduce the amount of each bolus, consider continuous feeds, check nutritional requirements to prevent overfeeding.</li> </ul>
	<ul style="list-style-type: none"> <li>Delayed gastric emptying</li> </ul>	<ul style="list-style-type: none"> <li>Consider post-pyloric feeding or pro-kinetic medication. Liaise with MO.</li> </ul>
	<ul style="list-style-type: none"> <li>Sub-optimal patient feeding position</li> </ul>	<ul style="list-style-type: none"> <li>Ensure upright position (more than 30 degrees) where possible during and after feeding for at least 30 minutes.</li> </ul>
	<ul style="list-style-type: none"> <li>Tube dislodgement</li> </ul>	<ul style="list-style-type: none"> <li>Check tube position regularly</li> </ul>
	<ul style="list-style-type: none"> <li>Medications e.g. opioids</li> </ul>	<ul style="list-style-type: none"> <li>Review medications</li> </ul>
	<ul style="list-style-type: none"> <li>Feeding formula too cold or concentrated</li> </ul>	<ul style="list-style-type: none"> <li>Ensure feed is administered at room temperature, consider changing to isotonic formula</li> </ul>
	<ul style="list-style-type: none"> <li>Physical agitation e.g. while transferring</li> </ul>	<ul style="list-style-type: none"> <li>Stop feeding at least 30 minutes prior to mobilisation or vigorous activity.</li> </ul>
<p>Examples of drug nutrient interactions may include but are not limited to:</p>		
<b>Drug nutrient interactions</b>	<ul style="list-style-type: none"> <li>Phenytoin</li> <li>Thyroxine</li> <li>Rifampicin</li> </ul>	<ul style="list-style-type: none"> <li>Moxifloxacin</li> <li>Ciprofloxacin</li> <li>Voriconazole</li> </ul>
	<ul style="list-style-type: none"> <li>Mono-amine oxidase inhibitors</li> </ul>	<ul style="list-style-type: none"> <li>Discuss most appropriate route with MO, Pharmacist and Dietitian.</li> <li>Viscous medications should be diluted well.</li> <li>Stop feeds 2 hours before, and resume 2 hours after administration.</li> <li>Alter feeding regimen to allow for breaks.</li> </ul>
	<ul style="list-style-type: none"> <li>Warfarin</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO, Pharmacist and Dietitian.</li> <li>Feeding formula components may reduce drug effectiveness.</li> <li>Ensure to flush well pre and post administration.</li> <li>It may help to stop feeds 1-2 hours before and after administration.</li> </ul>
<b>Ileus</b>	<ul style="list-style-type: none"> <li>Post-operative (Primary)</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian</li> <li>Should be able to resume enteral nutrition within 24 hours of trauma/surgery</li> <li>Consider post-pyloric feeding if delayed gastric emptying</li> </ul>
	<ul style="list-style-type: none"> <li>Paralytic (Secondary)</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian to potentially cease enteral feeds</li> <li>Consider TPN if enteral feeding unable to meet full nutritional requirements</li> <li>Consider post-pyloric feeding if delayed gastric emptying</li> <li>Monitor the patient for abdominal distension, pain, reflux, belching, nausea or increased aspirates</li> </ul>

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## WACHS Enteral Feeding Clinical Practice Standard

Problem	Cause	Considerations
<b>Reduced gut motility</b>	<ul style="list-style-type: none"> <li>Post-operative</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian</li> <li>Should be able to resume enteral nutrition within 24 hours of trauma/surgery</li> <li>Consider post-pyloric feeding if delayed gastric emptying</li> </ul>
Examples of abnormal biochemistry may include:		
<b>Abnormal biochemistry</b>	<ul style="list-style-type: none"> <li><i>Hypo</i> albuminaemia</li> </ul>	<ul style="list-style-type: none"> <li>Check feeding is adequate for needs.</li> <li>Check for infection/inflammation.</li> <li>Observe trends rather than single results.</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hyper</i> calcaemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian</li> <li>Check fluid intake is adequate</li> <li>Review supplementation especially if renal function is compromised</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hyper</i> glycaemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO, and Dietitian</li> <li>Review the need for insulin or oral hypoglycaemic medications rather than altering nutritional intake</li> <li>Consider low GI feed</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hyper</i> kalaemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian. Consider a low potassium formula.</li> <li>Review medications that cause retention. In rare circumstances consider reducing the feed rate where the gut is poorly perfused.</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hypo</i> kalaemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian. Review medications (diuretics).</li> <li>Consider supplementation.</li> <li>Check fluid intake is not excessive.</li> <li>Manage vomiting, diarrhoea and inadequate nutritional intake.</li> <li>Manage refeeding syndrome (refer to WACHS Refeeding Clinical Guideline)</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hyper</i> natraemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian. Review medications for sodium.</li> <li>Consider larger/more flushes.</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hypo</i> natraemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian. Review fluid intake.</li> <li>Consider supplementation.</li> </ul>
	<ul style="list-style-type: none"> <li><i>Hyper</i> phosphataemia</li> </ul>	<ul style="list-style-type: none"> <li>Discuss with MO and Dietitian.</li> <li>Review if excessive vitamin D supplementation.</li> <li>Consider phosphate binders if renal impairment.</li> </ul>

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## WACHS Enteral Feeding Clinical Practice Standard

Problem	Cause	Considerations
<b>Abnormal biochemistry - Continued</b>	<ul style="list-style-type: none"> <li>• <i>Hypo</i> phosphataemia</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss with MO and Dietitian. Review medications that bind with phosphate.</li> <li>• Manage any losses e.g. vomiting, diarrhoea malabsorption, refeeding syndrome.</li> <li>• Consider supplementation.</li> <li>• Manage refeeding syndrome (refer to WACHS Refeeding Clinical Guidelines – <i>currently in development</i>)</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Hyper</i> triglyceridaemia and/or abnormal liver function</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss with MO and Dietitian.</li> <li>• Review feeding regime for overfeeding especially of carbohydrate.</li> </ul>
	<ul style="list-style-type: none"> <li>• Urea and Creatinine high</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss with MO and Dietitian..</li> <li>• Check for dehydration or bleeding.</li> <li>• Consider changing formula.</li> </ul>
<b>Food allergies</b>	<ul style="list-style-type: none"> <li>• Egg Protein, Soy protein, Milk Protein</li> <li>• Coeliac disease</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Dietitian for specific advice</li> </ul>
<b>Food intolerances and avoidances</b>	<ul style="list-style-type: none"> <li>• Lactose, Amines, Salicylates, Glutamates</li> <li>• FODMAPs</li> <li>• Pork, beef</li> <li>• Kosher, Halal, Vegan</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to Dietitian for specific advice</li> </ul>

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