

Intensive Care Unit Nutrition Guidelines

Key Points

- MUST
- Malnutrition Screening
- Tube feeding; NG/NJ care plan, PEG/RIG, balloon gastrostomy
- Trouble shooting for tube feeds
- Out of hours enteral feeding guidelines
- Refeeding syndrome guidelines
- Fasting guidelines
- Risk assessment for nasogastric feeding in adults

These guidelines are intended for use cross-site at Frimley Park and Wexham Park Hospitals. There are some differences with products used at each site, therefore please ensure that the section you refer to is appropriate for your hospital site.

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Abbreviations

ANTT	Aseptic non touch technique
BMI	Body mass index
EN	Enteral nutrition
Fr/FG	French gauge/ size of tube lumen
MDT	Multi-disciplinary team
MUAC	Mid-upper arm circumference
MUST	Malnutrition universal screening tool
NETRD	Naso-Enteral Tube Retaining Device
NG (T)	Nasogastric (tube)
NJ (T)	Nasojejunal (tube)
ONS	Oral nutrition supplement
PEG	Percutaneous endoscopic gastrostomy
RIG	Radiologically inserted gastrostomy

Contents

INTRODUCTION	3
1. MALNUTRITION SCREENING AND MANAGEMENT GUIDANCE	3
2. REFEEDING SYNDROME: DEFINITION AND IDENTIFICATION OF PATIENTS AT RISK	5
3. CHOOSING A ROUTE FOR NUTRITION PROVISION	7
4. ENTERAL NUTRITION	8
5. ICU FASTING GUIDELINES FOR PROCEDURES	11
6. GASTRIC RESIDUAL VOLUMES AND GASTRIC MOTILITY AGENT	14
7. JEJUNAL FEEDING	15
8. WEANING OFF/STOPPING ENTERAL NUTRITION	15
9. ENTERAL FEEDING AND MEDICINES	15
10. PARENTERAL NUTRITION	19
11. ORAL NUTRITION	20
REFERENCES	21
APPENDIX 1: MALNUTRITION UNIVERSAL SCREENING TOOL (MUST)	23
APPENDIX 2: ESTIMATING HEIGHT FROM ULNA LENGTH	25
APPENDIX 3: CROSS SITE ICU FEED INITIATION PROTOCOL	26
Full Version Control Record	27

INTRODUCTION

This guideline is to assist nurses and doctors on assessment and monitoring of nutrition practices on the critical care unit, principally out of hours or until a Dietitian review. Please note that these are cross site guidelines so use the information relevant for your site. Please read these guidelines in conjunction with the 'Nutrition screening and oral guidelines for Adults' that are available on the Clinical guidelines platform.

Both Wexham Park Hospital (WPH) and Frimley Park Hospital (FPH) have a dedicated ICU Dietitian who is available Monday to Friday, within working hours 08:30-16:30. Please refer all appropriate patients to the Dietetics department to ensure timely assessments and management plans.

Contact numbers for the Dietetics departments at Wexham Park and Frimley Park Hospital can be found on the Intranet. <https://ourplace.xfph-tr.nhs.uk/patient-care/clinical-department-information-and-advice/nutrition-and-dietetics/>

1. MALNUTRITION SCREENING AND MANAGEMENT GUIDANCE

Completion of "Malnutrition Universal Screening Tool" (MUST) training is an essential yearly training requirement for all nurses across FHFT. Early nutritional assessment is essential, and the MUST (Appendix 1) should be completed within six hours of admission and repeated weekly.

Every patient should be weighed on admission and the weight recorded in the MUST on Epic (this assessment is located within the Admission Navigator for nurses); weight should be repeated and recorded weekly unless otherwise indicated. If it is not possible or if inappropriate to weigh, e.g., if the patient is receiving end of life care, this should be documented on the MUST.

If necessary, correct the actual weight for presence of oedema and/or ascites by subtracting the oedema and/or ascites from actual weight, as indicated below. Actual dry body weight should be used to calculate BMI.

Severity (use clinical judgement)	Oedema	Ascites
Minimal	1.0kg (hands, feet, ankles, sacral oedema)	2.2kg
Moderate	5.0kg (pitting oedema to knees, hands, arms, sacrum)	6.0kg
Severe	10.0kg (generalised oedema and third spacing)	14.0kg

If the patient is unable to be weighed, then check previous medical notes, including connected care or ask the patient and/or family members if they know the patient's weight. Please indicate if the weight is actual, estimated or reported. If inappropriate to weigh, then please document accordingly, e.g., if the patient is receiving end of life care. If weight

cannot be obtained, use mid-upper arm circumference (MUAC) to give an estimated BMI (BAPEN, 2003), and complete sections on subjective criteria for MUST. Further details on measuring and interpreting MUAC can be located in the MUST assessment in Epic.

Every patient should have their height recorded on the MUST (on the Admission Navigator under Assessments). If a height measure is not available, ask the patient/family for an accurate height or measure ulna length for an estimated height. Please refer to https://www.bapen.org.uk/pdfs/must/must_page6.pdf for how to measure ulna length

Percentage weight loss

- Identify if the patient has had any weight loss prior to coming to ICU, this is of particular importance if unintentional.
- Using the patient's dry weight, compare this to their normal healthy weight and calculate any weight loss using the weight loss chart provided, see Appendix 1: MUST tool.
- Indicate timeframe of percentage weight loss.

$$\text{Percentage weight loss} = \frac{[\text{usual weight (kg)} - \text{current weight (kg)}]}{\text{usual weight (kg)}} \times 100$$

BMI is automatically calculated by Epic provided that the weight and height criteria have been filled. BMI is calculated by using the calculation below:

$$\text{BMI} = \text{weight (kg)} / (\text{height (m)})^2$$

Patients who are at high risk of malnutrition are those who have a MUST score of 2 or more (BAPEN 2003) and should be referred to a Dietitian by completing an Inpatient consult to Dietetics on Epic. If a patient scores MUST less than 2, but using clinical judgement you feel specialist dietetic input is required, please refer to the dietitian and include details of reason for referral. Please note, patients with eating disorders and a low BMI will require specialist multidisciplinary team input. FHFT eating disorder guideline is available on Frimley Guidelines.

All health care professionals should be implementing MUST care plan interventions at the point of the initial MUST screening. This supports early nutrition care and reduces the negative impact of poor nutrition on co-morbidities, length of stay and mortality. MUST care plans should be implemented prior to a Dietetic consult and is FHFT's first line nutritional intervention support.

If as a Nurse professional, you have completed the training on first line interventions, you will be able to add first line oral nutrition supplements, Fortisip Protein Compact, to the patient's Epic orders.

Measurement of dietary intake

Monitoring oral dietary intake is key in determining the adequacy of a patient's diet and can help to determine if escalation to more aggressive nutrition support is required. ALL oral intake for those patients who are eating and drinking, including nutritional supplements, must be recorded on the Epic flowsheet.

2. REFEEDING SYNDROME: DEFINITION AND IDENTIFICATION OF PATIENTS AT RISK

'Refeeding syndrome can be defined as a group of biochemical shifts and clinical symptoms that can occur in the malnourished or starved individual upon the reintroduction of oral, enteral or parenteral nutrition' (Solomon and Kirby 1990) (PENG 2018).

Criteria for defining the risk of Refeeding Syndrome (NICE Guidelines 2006)	
At risk: <u>Any patient who has had very little or no food intake for more than 5 days</u>	
High Risk if one or more of the following: • Body Mass Index less than 16kg/m² • Unintentional weight loss greater than 15% within the last 3-6 months • Little or no nutritional intake for more than 10 days • Low levels of potassium, phosphate or magnesium prior to feeding	High Risk if two or more of the following: • Body Mass Index less than 18.5 kg/m² • Unintentional weight loss greater than 10% within the last 3-6 months • Little or no nutritional intake for more than 5 days • A history of alcohol abuse or drugs including insulin, chemotherapy, antacids or diuretics
Extremely High Risk of Refeeding Syndrome • Very low Body Mass Index < 14kg/m² • Not eaten for > 15 days *Please note that NICE criteria serve as a guide to identify those who may be at risk and should be considered in conjunction with clinical assessment	

Biochemical shifts and clinical symptoms of Refeeding Syndrome may present in:

- Hypophosphataemia
- Hypokalaemia
- Hypomagnesaemia
- Altered glucose metabolism
- Fluid balance abnormalities
- Thiamine deficiency

These may lead to cardiac, respiratory, neuromuscular, renal, metabolic, haematologic, hepatic and gastrointestinal symptoms.

Management of Refeeding Syndrome

Step 1 - Biochemistry

Check baseline urea and electrolyte biochemistry including Phosphate, Magnesium, and Adjusted Calcium and replace as necessary. Consult Trust electrolyte replacement guidelines, found on the intranet under clinical guidelines, general medicine, electrolytes (pocket guide). If further guidance is needed, consult your ward pharmacist.

Caution with patients who are severely malnourished, dehydrated or have renal impairment as normal or elevated plasma levels of electrolytes can decrease rapidly or be misinterpreted. Biochemistry should be repeated daily and corrected as necessary.

Step 2 – Micronutrient supplementation

Prescribe micronutrient supplementation as appropriate:

Oral	Enteral	Parenteral
Initial dose should be given 30 minutes before starting to feed and continued daily until appropriate	Initial dose should be given 30 minutes before starting to feed and continued daily until appropriate	Initial dose should be given 30 minutes before starting to feed and continued daily until appropriate
Thiamine 100mg BD Vitamin B co strong 1-2 tablets TDS	Pabrinex I+II ampoules in 50ml 100ml sodium chloride 0.9% or glucose 5%. If Pabrinex is not available IV thiamine 250 mg OD for 3 days	Pabrinex I+II ampoules in 50ml 100ml sodium chloride 0.9% or glucose 5%. If Pabrinex is not available IV thiamine 250 mg OD for 3 days

Step 3 – Observation and Monitoring

Observation and monitoring of the patient including:

- Cardiac and respiratory observations
- Daily blood glucose monitoring
- Daily fluid balance monitoring
- Clinical observations, e.g., muscular weakness/cramps, tetany, oedema, bowels or vomiting
- Daily weight

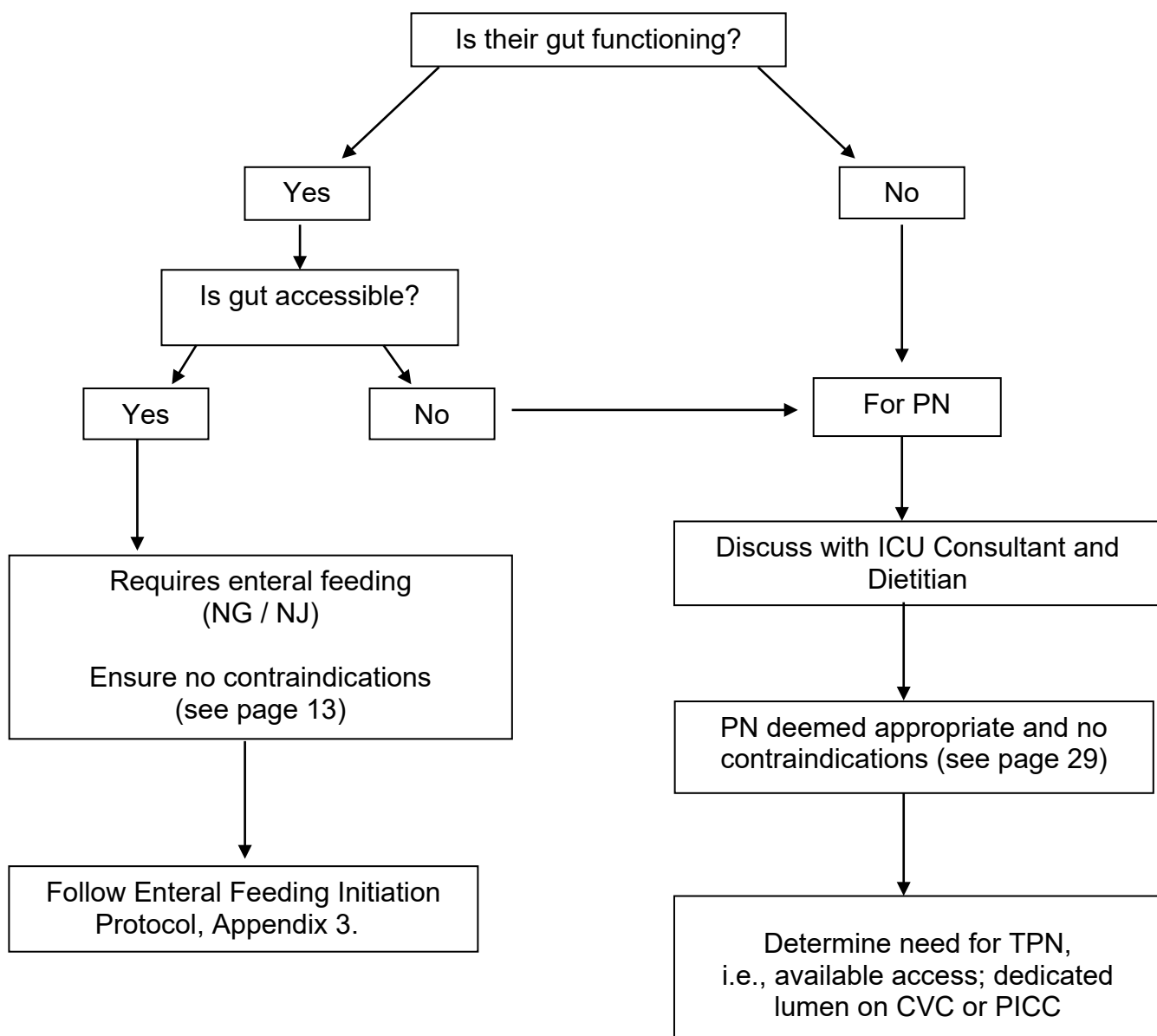
ECG Monitoring - Patients at extremely high risk of Refeeding Syndrome, e.g., very low body mass index < 14kg/m² and/or not eaten for > 15 days, are recommended to have ECG monitoring.

Step 4 – Slow re-introduction of nutrition

Nutritional support can be started simultaneously whilst correcting electrolytes; however, emphasis should be placed on a slow and cautious reintroduction of food and nutritional supplements or enteral nutrition.

3. CHOOSING A ROUTE FOR NUTRITION PROVISION

Artificial nutrition is indicated if a patient is unable to have adequate oral intake or if oral intake will be absent for more than 3 days (ESPEN). Aim to start nutrition within 24-48hours of admission to ICU once the patient is haemodynamically stable.



4. ENTERAL NUTRITION

ESPEN/ASPEN recommend that enteral nutrition is started within 24-48 hrs of admission to ICU provided that the patient is haemodynamically stable and there are no contra-indications. Please refer to Appendix 3: Cross site Feeding Initiation Protocol, when commencing enteral nutrition for ICU patients.

Contraindications for enteral nutrition

- Gastrointestinal ischaemia
- Acute active bleeding to GI tract
- Mechanical ileus
- Cardiovascular instability with inadequate filling and/or requiring high dose of positive inotropic agents
- Ethical Aspects
- Basal skull fractures
- Intractable diarrhoea and/or vomiting
- High output small bowel fistula
- Oesophageal fistula, oesophageal cancer, pharyngeal pouch ~ note nasogastric tube insertion can be dangerous, if suspected seek senior clinical advice and consider placement under fluoroscopic guidance
- Complete Intestinal Obstruction

All initial NG insertions should have placement confirmed as per Trust guidance - 'Insertion and ongoing care of nasogastric feeding tubes in adults' available on the intranet. Invasive Procedure Safety Checklist: NG Tube Insertion should be completed and added to the patient's Epic notes. This can be found on Epic using the *SmartText Lookup*: FHFT ICU NG. See related documents on Intranet.

It is acknowledged that within ICU a risk assessment may be required where NG position cannot be confirmed with a pH check, to support safe feeding practices. You can view/use this document, by:

1. Going to "Notes" tab
2. choose "Progress" tab
3. start a new note with "Create in Notewriter"
4. then choose "Blank note"
5. click in the note field and type ".ngt"
6. the system will offer you the smart text, accept it
7. you can navigate the form by pressing the button F2, which will always jump to the next area that needs attention below the cursor/last edited.

8. The answers default to the most common negative result, so changing it to a positive finding will need conscious effort and attention. Otherwise, it will be quick to fill in a standard confirmation.

See related documents on Intranet

Feeding position and Proning

Feeding position	The patient must be at a minimum of 30–45-degree angle during feeding and for at least an hour after feed has stopped. If patients are unable to be positioned in this way, i.e., due to spinal injury it may be necessary to consider post-pyloric feeding in order to reduce the risk of reflux and aspiration
Proning	NG feed must be held 1-hour pre proning and supinating, and NG tube aspirated, and aspirate discarded. Once the patient has been prone or supinated, confirm NG position with pH check. If pH is 5.0 or below, NG feed can be resumed. The patient must be positioned in the reverse Trendelenburg position (foot of bed 30–40-degree angle down) and full tilt of bed at 30 degrees.

Care of Enteral Tubes and Troubleshooting

Flushing enteral feeding tubes	All enteral feeding tubes in a critical care setting should be flushed with a minimum of 30-50 ml sterile water in the following incidences: - Before commencing feed - When feeding has finished - Between each feed container - Before and after medications and 5-10ml between each medication - Before and after administration of ProSource TF and Nutrison protein shot <u>Please note:</u> ProSource TF and Nutrison protein shot are only to be administered via an enteral feeding tube and should only be given when prescribed by a Dietitian. - When the feed is disconnected or stopped for any procedures, e.g., Sedation hold with intent to extubate - Nasojejunal and Jejunostomy tubes should be routinely flushed 4-6 hourly even if enteral feed is being administered.
Mittens	Some patients may continue to find the tube irritating and continue to pull at it. Try to establish the reason why the patient is finding the tube problematic. It could be because the tube has become dislodged internally and therefore irritating the throat, in which case it will need re-siting. It may also be that the patient may no longer wish to be fed this way. If this is the case it should be discussed with the patient, family and medical team and possible issues around capacity discussed. The use of Mittens may prevent removal of the nasogastric/nasojejunal tube. Please refer to the Mental Capacity Act and Deprivation of

	Liberty Standards Policy (MCA/DOLS) on the intranet for the assessment and use of mittens. This includes a hand control mittens assessment tool/record that should be filed in the patient's notes.
Nasal-Enteral Tube Retention Device (NETRD)	The nasal retention device allows the nasogastric/nasojejunal tube to be secured more definitively than with other measures but does not reduce the risk of internal migration caused by coughing, retching, or suctioning etc. You do not need to apply for DOLS to use these devices. If it is felt that a NETRD may be required, this should be discussed with the patient, family and medical team. It should not be used as a method of enforcing feeding where the patient has capacity to make such a decision as to refuse treatment. During working hours, patients must be referred to the Nutrition Support Nurse for assessment and placement of NETRD. For further information on placement or care of retention device, please refer to the nutrition support nurse or the 'Insertion and ongoing care of nasogastric feeding tubes in adults guideline' on the intranet.
Managing blocked NGTs	If an NGT is blocked then this should be removed and the tube replaced. Do not reinsert guide wire due to risk of perforation.
Managing blocked NJTs and Gastrostomies	If the tube is newly placed and there is an issue with blockage, follow the steps below: - Endoscopy/IR should flush the tube after the procedure to confirm it is not kinked. - Request an AXR to check for kinking if the patient is in a clinical area and the NJ tube is not functioning after insertion. - If a kink is detected, retract the tube by 5-10 cm or more depending on the kink's location, ensuring the tube remains post-pyloric. - Liaise with the Enteral Nutrition CNS during working hours or the on-call gastro team outside of hours. Blockages should not happen if the tube is always flushed as instructed, however to clear a blocked tube: • Try to aspirate any contents first Gently squeeze/roll (or 'milk') blocked section of tube between finger and thumb to try and disperse any blockage • Try to flush with warm water (not hot). • Use a push-pull action with the syringe to try and help move the blockage If no success: • Try carbonated soda water in 50ml syringe, this can be obtained from the kitchen. If still no success try: If blockage persists keep trying to unblock the tube every 20-30mins

	If after 4 hours the tube is still blocked, contact the Enteral Nutrition CNS or the Dietitians. If unavailable, contact the patient's doctor. Please ensure IV fluids are requested if the patient is reliant on tube feeding for hydration. Do not reinsert guide wire due to risk of perforation Do not reinsert guide wire due to risk of perforation. Do not use cranberry juice, cola, or pineapple juice as they are acidic and may contribute to tube degradation or further blockage. Do not use a syringe size smaller than 10ml, this will cause an increased pressure within the tube and may cause it to burst, potentially inside the patient.
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Intake of enteral nutrition and losses (stoma, fistula, wound drainage, NG output) should be documented on Epic flowsheets.

For any further guidance please refer to Adult enteral nutrition guideline.

5. ICU FASTING GUIDELINES FOR PROCEDURES

The following guidelines are to be used for patients with a protected airway. If a patient is self-ventilating, they should fast for six hours for all procedures.

Stopping Enteral Nutrition

Before extubation/placement of surgical or percutaneous tracheostomy/airway procedure

EN stopped 4 hours before the procedure (Time for procedure must be checked with ICU Consultant/theatre).

- Accompanying insulin infusions should be stopped at same time as the feed
- Blood glucose should be monitored hourly
- Maintenance fluids may be required if EN cessation is over 2 hours
- If insulin is felt necessary to control blood glucose, then glucose may be required intravenously whilst EN is ceased

Before scans

NO FASTING. EN should be stopped shortly before transfer to scan.

- The NG tube should be aspirated, and gastric contents discarded
- The NGT should be capped
- Accompanying insulin infusions should be stopped at same time as the feed

Before laparotomy or abdominal surgery

EN stopped 4 hours before the procedure (Time for procedure must be checked with ICU Consultant/theatre).

- Accompanying insulin infusions should be stopped at same time as the feed
- Blood glucose should be monitored hourly
- Maintenance fluids may be required if EN cessation is over 2 hours
- If insulin is felt necessary to control blood glucose, then glucose may be required intravenously whilst EN is ceased

Before non-airway surgery and procedure, e.g., orthopaedic surgery

NO FASTING. EN should be stopped shortly before leaving for theatre.

- The NG tube should be aspirated, and gastric contents discarded
- The NGT should be capped
- Accompanying insulin infusions should be stopped at same time as the feed
- Blood glucose should be monitored hourly

Before oesophago-gastroduodenoscopy (OGD)

EN stopped 6 hours before the procedure (To ensure good views of the GI tract).

- Accompanying insulin infusions should be stopped at same time as the feed
- Blood glucose should be monitored hourly
- Maintenance fluids may be required if EN cessation is over 2 hours
- If insulin is felt necessary to control blood sugar then glucose may be required intravenously whilst EN is ceased

Before transoesophageal echocardiogram (TOE)

EN stopped 4 hours before the procedure

- Accompanying insulin infusions should be stopped at same time as the feed
- Blood glucose should be monitored hourly
- Maintenance fluids may be required if EN cessation is over 2 hours
- If insulin is felt necessary to control blood glucose, then glucose may be required intravenously whilst EN is ceased

Before bronchoscopy

EN stopped 4 hours before the procedure

- Accompanying insulin infusions should be stopped at same time as the feed
- Blood glucose should be monitored hourly
- Maintenance fluids may be required if EN cessation is over 2 hours
- If insulin is felt necessary to control blood glucose, then glucose may be required intravenously whilst EN is ceased

Water and medications during fasting period

- The patient can continue to have water via the NGT up to 2 hours prior to the procedure (if it is medically appropriate for them to do so and they have been doing previously)

- Enteral medications should continue to be given during the fasting period unless otherwise stated by the medical team

Restarting Enteral Nutrition

Post placement of surgical or percutaneous tracheostomy/airway procedure

The NGT position must be reconfirmed after the procedure before restarting EN at the last documented hourly rate.

Post scans

EN should be restarted immediately at last documented hourly rate.
The NGT position must be reconfirmed prior to starting the EN.

Post laparotomy or abdominal surgery

Check with the ICU Consultant/surgical team before restarting EN.

- If a Ryles tube has been placed in theatre, please note that this is for drainage only and cannot be used for feeding
- If an NGT is in situ the position must be reconfirmed after the procedure before restarting feed. Check with the dietitian or ITU consultant if out of hours.
- It may be appropriate to start the feed at a reduced rate post-surgery

Post extubation/non-airway surgery and procedure e.g. orthopaedic surgery

If after 4 hours, the patient is stable the NGT position must be reconfirmed and the EN can be recommenced at the last documented hourly rate.

Post oesophago-gastroduodenoscopy (OGD)

Unless OGD findings have provided a contraindication to EN the NGT position must be reconfirmed and the EN can be recommenced at the last documented hourly rate.

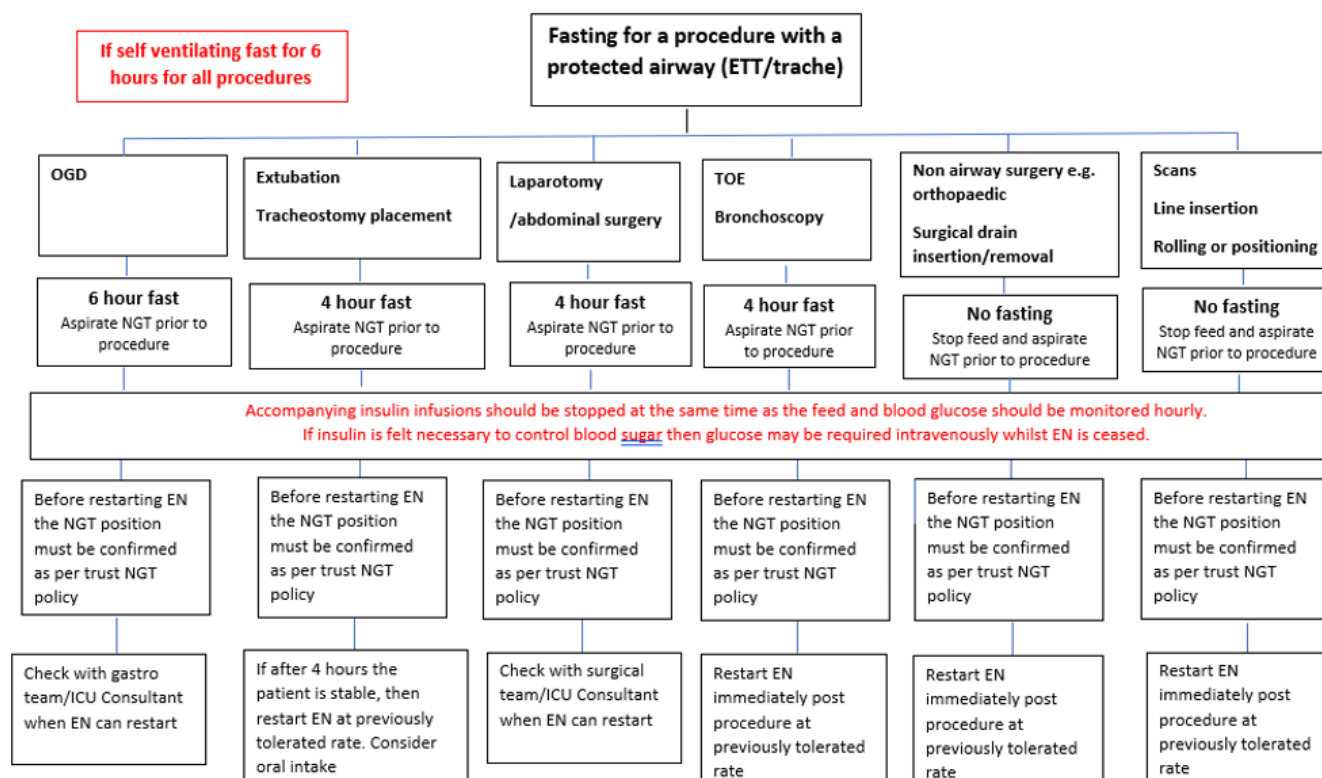
Post transoesophageal echocardiogram (TOE)

The NGT position must be reconfirmed after the procedure before restarting EN at the last documented hourly rate.

Post bronchoscopy

The NGT position must be reconfirmed after the procedure before restarting EN at last documented hourly rate.

QUICK GUIDE TO FASTING TIMES AND RESTARTING ENTERAL FEED IN PATIENTS WITH PROTECTED AIRWAYS



6. GASTRIC RESIDUAL VOLUMES AND GASTRIC MOTILITY AGENTS

Gastric residual volumes (GRVs) can be used to monitor the rate of gastric emptying and reflect enteral feeding tolerance. Current literature is inconclusive with regards to specific cut-off volumes and correlation with aspiration risk.

Gastric residual volumes should be monitored according to Appendix 3: ICU Enteral Feeding Initiation Protocol. As agreed by the intensive care team, current cut-off values are 400ml with 4 hourly aspirates, when initiating enteral nutrition, see below.

4 hourly aspirates when Initiating Enteral Nutrition	
Aspirate volume	Action
≤ 400ml	➤ Return 400ml aspirate and recommence feed. ➤ Increase feed rate if not yet at goal rate.
> 400ml	➤ Return 250ml aspirate and recommence feed at the current rate. ➤ Do not stop the feed ➤ Repeat aspirates 4 hourly ➤ If two consecutive high aspirates > 400ml, reduce rate by 20ml/hr to a minimum of 10ml/hr and notify a doctor. ➤ Once the rate has been reduced, repeat aspirate after 4 hours. If > 400ml then discuss with doctor to initiate a prokinetic. ➤ If <400ml increase rate as per protocol.
Pro-kinetic medications	

The first line drug of choice when large aspirates persist **after 24 hours** of attempted enteral feeding:

Metoclopramide IV 10mg TDS, review on a daily basis due to risks of neurological adverse effects and tachyphylaxis.

If gastric residual volumes remain high **after 48 hours** of attempted enteral feeding, consider low dose Erythromycin IV 250mg or 3mg/kg IV TDS, in discussion with doctors, and review daily.

Do not start erythromycin without trial of metoclopramide unless this is contraindicated.

If high aspirates persist despite use of prokinetics then consider NJT placement.

7. JEJUNAL FEEDING

Feeding into the jejunum should be considered in patients with:

- Pancreatitis
- Delayed gastric emptying
- Gastric outflow obstructions
- Large aspirates persisting after 72 hours of NG feeding despite the use of prokinetics. This should be considered prior to initiating on TPN, unless contraindicated.

Feeding options include nasojejunal (NJ) or jejunostomy feeding. Studies have shown that when small bowel feeding is in progress the gastric residual volume can double.

Increased gastric aspirate is therefore not always a sign of malabsorption or regurgitation of feed from the small bowel to stomach, but a consequence of small bowel feeding causing secretion of gastric fluid. Gastric decompression via a NG drainage tube can reduce the risk of aspiration in this situation.

8. WEANING OFF/STOPPING ENTERAL NUTRITION

- Patients should be trialled on oral foods prior to enteral nutrition being stopped.
- Start to reduce the feed when the patient is tolerating some food orally and when patient can manage small portions regularly.
- The rate at which the feed should be reduced will vary depending on each patient. For out of hours, as a guide, when the patient is managing half portions or more at mealtimes reduce the feeding rate by 50% or continue at the same rate but feed for 12 hours overnight.
- Keep accurate food charts to monitor oral intake.
- Patients who are able to drink at least level 2 consistency fluids, can be offered Fortisip compact protein twice a day. Check for any allergies prior to this.

9. ENTERAL FEEDING AND MEDICINES

Drug therapy review

Drugs need to be reviewed to determine the therapeutic rationale for each prescription and to discontinue any therapy for which this cannot be identified, or where there is inappropriate therapeutic duplication.

Seek advice from your pharmacist if your patient needs liquid medicines or if you have to crush tablets. Information is also available on NEWT (password is available on pharmacy links section on the Intranet).

Firstly, determine which of the drugs need to be administered via the feeding tube or what choice of alternative routes of administration is available.

Alternative routes such as injections and suppositories are useful for short-term management but are rarely practical in chronic disease management.

Key Points

- Reduce drug therapy to the minimum necessary.
- Determine alternative formulations and routes available where possible.
- Make any therapy changes in an environment in which the patient can be effectively monitored.

Choice of medication

Many factors are to be considered when deciding which medication formulation is appropriate for administration via an enteral feeding tube. It should be addressed whether the situation is short-term or long-term, the likelihood and potential seriousness of causing a feeding tube blockage, the ability to monitor the effect of medication and the potential seriousness of missing medication doses.

Drug interactions

Interactions between enteral feeds and drugs can be clinically significant. Drugs can interact with nutritional therapy and nutrients in many ways. For example: only normal-release formulations can be given via the enteral feeding tube, resulting in higher peak plasma concentrations than with modified-release formulations.

Steps should be taken to avoid or minimise the effects of significant interactions. In the absence of any data, monitor closely for loss of drug effect or increased side-effects. The resulting drug and nutrition regimen should be practical and acceptable to the patient/carer.

Some clinically significant interactions can be found in the table below (this list is not exhaustive). Please liaise with ICU pharmacist to determine appropriate feed breaks.

Antiretroviral medications	Liaise with Pharmacist.
Ciprofloxacin	Ciprofloxacin interacts with enteral feeds to produce insoluble chelates, and the absorption of the drug is significantly reduced. This may be particularly significant when it is administered directly into the jejunum. Stop feed 2 hours before dose, restart 2 hours after dose.
Phenytoin	First line parenteral injection, as enteral absorption is extremely unpredictable. If given enteral stop feed 2 hours before dose, restart 2 hours after dose. <i>*NEW WARNING* from Newt: numerous papers are available describing the problems of administering phenytoin via enteral feeding tubes. The use of feeding breaks has been shown NOT to improve drug absorption.</i>

	<i>It is recommended that phenytoin should NEVER be administered via enteral feeding tube.</i> Liaise with the pharmacist.
Quinolone antibiotics, e.g., Voriconazole	Decreased absorption of voriconazole, withhold feed for 2 hours before and 1 hour after dose.
Rifampicin	Absorption of enteral rifampicin can be decreased by concomitant food or milk. Stop feed 2 hours before dose, restart 1 hour after dose. Should be given on an empty stomach. Optimal absorption of rifampicin is achieved if the dose is given 30 minutes before food or 2 hours after.
Tacrolimus	Allow a 2-hour feed break before administration and restart feed 1 hour after.
Theophylline	The pharmacokinetics of theophylline can be altered by the nutritional formula of enteral feeds (the half-life is decreased by high protein, low carbohydrate diets, and increased by low protein, high carbohydrate diets) Some sources recommend that theophylline is administered on an empty stomach due to a potential interaction with enteral feeds. Modified-release preparations for enteral route are not available. Liaise with the pharmacist.

Adapted from sources:

- Handbook of Drug Administration via Enteral Feeding Tubes
- The Newt Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties.

Administration of Liquid Medicines via Enteral Feeding Tubes

An appropriate size oral/enteral syringe should be used to measure and administer oral liquid medicines via enteral feeding tubes. The same syringe should be used to draw up and administer a flush afterwards to ensure the full dose is given.

Patient's medication should be reviewed regularly, and any unnecessary medicines held. There should be close liaison with the pharmacist and the doctor regarding appropriate route for medication.

Administration of Liquid Medicines via Enteral Feeding Tubes

Seek advice from your pharmacist if your patient needs liquid medicines or if you are having to crush tablets

DO NOT crush enteric coated tablets or SR (sustained release), MR (modified release), LA (long acting), XL (extended release) tablets unless advised by the pharmacist, they may cause toxic side effects if administered via this route.

Inadequate tube flushing is the most common cause of tube blockage

Enteral syringes MUST be used for the administration of all liquid medications/flushes

If the feed is running - **STOP THE FEED**

If the patient is in a rest period
CHECK pH BEFORE ADMINISTRATION OF MEDICINES

Flush the tube with a minimum of 30mls water

PREPARE EACH DRUG SEPERATELY
Never mix drugs

Rarely a drug should not be mixed with water – pharmacy will advise if this is the case

Soluble Tablets	Liquids	Tablets	Capsules
Remove plunger from the syringe and place tablets to be dissolved inside, reinsert plunger and draw up 10-15ml of sterile water and gently shake to disperse/dissolve tablet and administer via tube. Use the same syringe to draw up water and flush the tube.	SHAKE WELL If viscous (thick) dilute with an equal amount of sterile water and administer via tube. Use the same syringe to draw up water and flush the tube.	UNCOATED & SUGAR COATED ONLY Crush and transfer to cup. Rinse the tablet crusher using sterile water into the cup using to ensure whole dose is given and administer via tube. Use the same syringe to draw up water and flush the tube	Seek advice from pharmacy as to whether capsule can be opened. Open capsule and mix contents with 15-30ml of water and administer via tube. Use the same syringe to draw up water and flush the tube

If more than one medicine is to be administered – flush between drugs with 10-15ml water

Flush tube, using a pulsing technique with at least 30ml sterile water following the administration of the last drug
(Note: If feeding via NJ tubes this will need to be flushed with 50ml sterile water to avoid blockage)

Do you need to allow a break before restarting the feed?

Re-start feed if indicated.

Remember: Seek advice when using Cytotoxic and hormone based drugs – they are a risk to YOU.

Remember to document the volume of fluid given with medications on the Fluid Chart.

10. PARENTERAL NUTRITION

Parenteral nutrition should only be given when enteral nutrition has been considered and excluded or is contra-indicated. Provision of parenteral nutrition for less than 5 days is usually not clinically indicated as the risks tend to outweigh the benefits.

Indications	Contraindications
• Paralytic ileus • Gastro-intestinal obstruction, e.g., oesophageal cancer, gastric outflow, small bowel obstruction where the obstruction cannot be bypassed by enteral feeding tube • High output enteral fistula • Short bowel syndrome • Severe acute pancreatitis where post-pyloric feeding is not tolerated • Severe emesis where post-pyloric feeding has failed	• Functioning gastrointestinal tract • Treatment anticipated for less than 5 days in patient without severe malnutrition prior to critical illness • Prognosis doesn't warrant support Contraindications to lipid emulsions • Severe egg allergy • Nut allergy • Soya allergy • Known abnormal lipid metabolism (ESPEN 2009, 2019)

Starting a patient on parenteral nutrition

FHFT does not support the initiation of PN in the absence of an MDT assessment. If it is felt that a patient will require PN in the absence of the Nutrition Support Team (NST) or Dietitian being available, i.e., at the weekend, then a referral should be made to ensure timely assessment on the next working day.

All patients who are considered a potential candidate for PN should be referred to the NST/ Dietitian via Epic for full assessment before prescribing can take place.

The team responsible for the care of the patient needs to complete the referral by placing an order on Epic for 'Inpatient Consult to Dietetics', select reason for consult 'Parenteral Nutrition'. The patient will be assessed by the Ward Dietitian and/or the NST to assess their suitability to receive PN.

PN is provided by Pharmacy via an external Aseptic Unit; therefore, orders for PN are routinely completed by 10am every working day morning.

For Pharmacy Opening Hours check Trust page.

Out of hours parenteral nutrition

'PN is not an emergency intervention in adults and there is rarely an indication for it to be started out of hours.' (NCEPOD 2010). 'Patients deemed to require parenteral nutrition should have their nutritional requirements determined by healthcare

professionals with the relevant skills and training in the prescription of nutrition support, thus an MDT assessment is recommended to minimise complications' (NICE).

If it is felt that a patient will require PN in the absence of the NST or Dietitian being available, i.e., at the weekend, then a referral should be made to ensure timely assessment on the next working day.

During this time, it is advised that the surgical/medical team caring for the patient ensure that the patient is adequately hydrated, and correction of electrolyte disturbances has occurred in preparation for nutritional assessment on the next working day.

The only circumstance where PN will be available out of hours will be over a four-day bank holiday. In this situation an out of hours bank holiday regimen will be available and this will be managed by Pharmacy. The patient will still need to be referred for PN in the usual way and will require an assessment to determine their suitability for PN by Pharmacy. Please call the pharmacy department.

Stopping parenteral nutrition

Before stopping parenteral nutrition then please contact the Dietitian. If out of hours, parenteral nutrition should not be stopped until adequate oral or enteral nutrition is tolerated, and nutritional status is stable. Stopping suddenly should be avoided due to the risk of hypoglycaemia, close monitoring of blood glucose should continue once parenteral nutrition has stopped to ensure no rebound problems.

If sudden stopping of the parenteral nutrition is unavoidable, e.g., line sepsis, then blood glucose monitoring should be done 4 hourly for the following 24 hours.

11. ORAL NUTRITION

Protected Mealtimes and Standard Operating Procedure

Protected mealtimes are periods of time where all non-urgent clinical activity stops on a hospital ward unless it is an emergency. During these times patients can eat without being interrupted and staff are available to assist. See the Trust's **Mealtime guideline** for more information.

Menus and Therapeutic Diets Available

The trust caters for ethnic and cultural requirements, allergies as well as therapeutic diets. Please link with catering team if any of this information is required.

Documenting oral intake

All oral intake should be documented on the Epic flowsheet following nutrition screening in accordance with the nutrition management guidance. This should include all oral intake of fluids and food, including oral nutrition supplements and any additional items brought in by relatives. Multiple attempts to encourage the patient to eat or drink without success and therefore refusal of food by the patient should also be documented.

Oral nutritional supplements

If appetite and oral intake is poor, less than half of the meal eaten, then consider offering the patient first line oral nutritional supplements; Fortisip compact protein BD, suitable for patients recommended level 2 fluids or thinner. If the patient has food allergies or is on thickened fluids, please first consult with a Dietitian.

Please refer to advice on how to take oral nutritional supplements, below.

Advice for taking oral nutrition supplements

- Encourage supplement drinks **between** meals
- Supplements are best served cold; however, they do not have to be stored in the ward fridge
- Encourage slow sips over the course of an hour
- Some patients may need assistance opening the lid or prefer the supplement in a cup
- Once opened, any supplement drink not finished after 4 hours should be discarded to comply with Frimley Health Infection Control Guidelines. The amount of supplement taken should be documented on the Epic flowsheet.

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APPENDIX 1: MALNUTRITION UNIVERSAL SCREENING TOOL (MUST)

The process information below is taken from the Epic Tips sheet for Inpatient Clinicians. Please access tipsheet via Epic Tipsheets for any updates to this.

On Admission

Completing a MUST assessment is required documentation **within 6 hours** of admission. On admission, this includes completing the nutrition screening section as well.

This assessment is located within the Admission Navigator for nurses to easily access.

You must complete all fields to obtain an accurate score. If sections are not completed, the score will not be accurate.



The score will automatically calculate based on the information selected in each required field designated by the red clock symbol. You must enter a unit of measurement for the height and weight fields (ie. kg, cm).

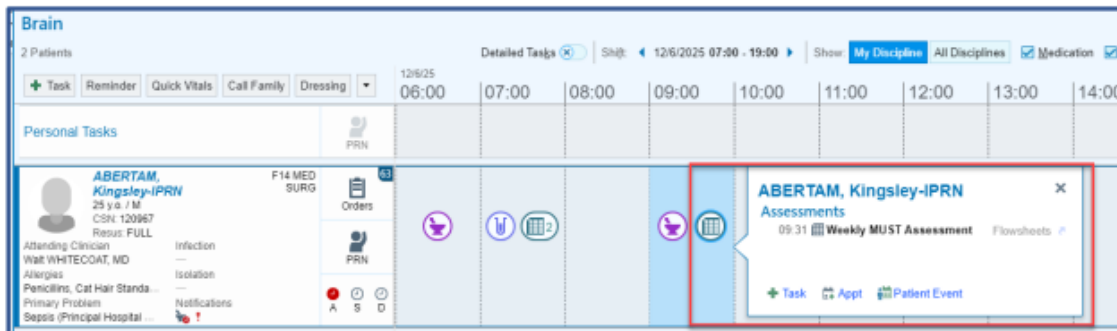


You can use Connected Care to find a patient's usual weight.

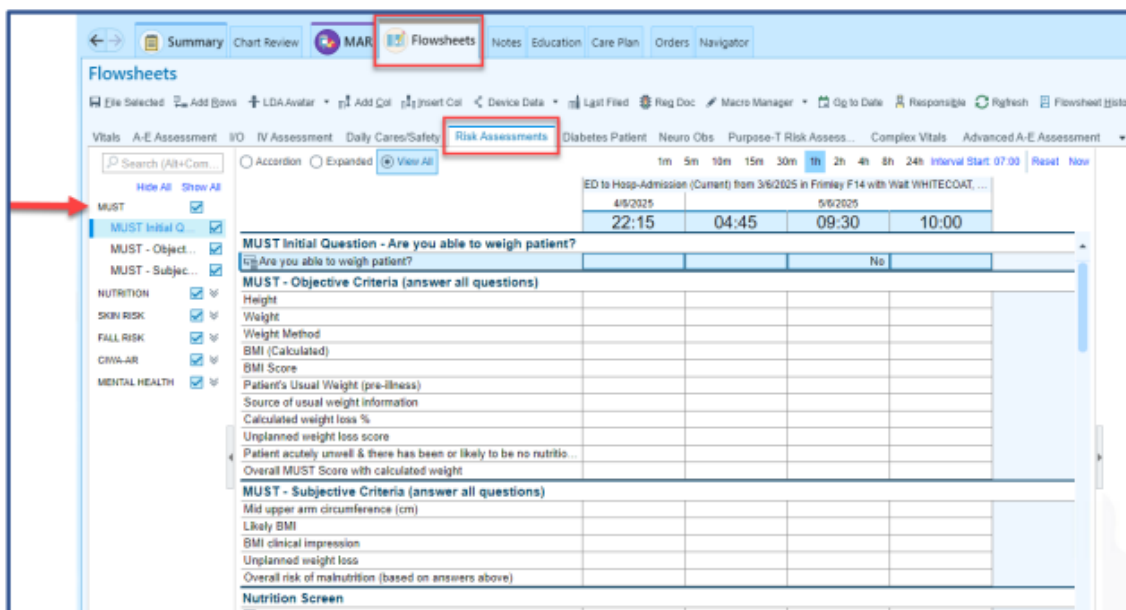
Reassessment

Reassessment of MUST should be repeated weekly or more frequently if the clinical condition of the patient changes.

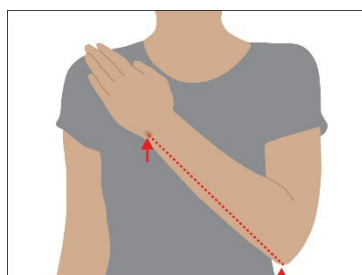
- You will get a task on the Brain to remind you to complete the weekly reassessment.



- You can access the MUST assessment in Flowsheets.
- Select the **Risk Assessments Flowsheet**. MUST appears as the first group.
- Complete all rows in the MUST assessment and the score will automatically calculate.



APPENDIX 2: ESTIMATING HEIGHT FROM ULNA LENGTH

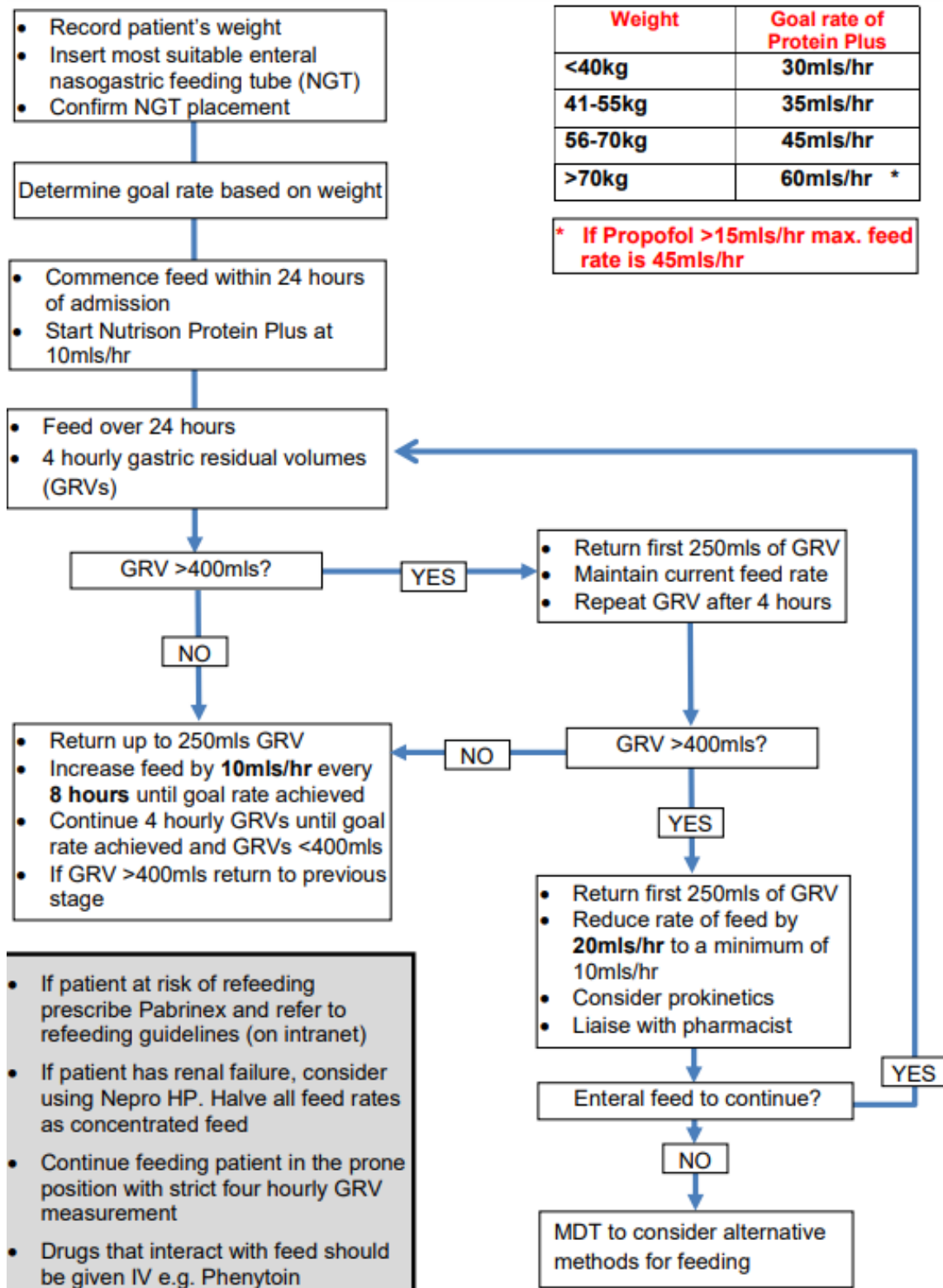


Measure between the point of the elbow (olecranon process) and the midpoint of the prominent bone of the wrist (styloid process)

HEIGHT (m)	Men (<65 years)	1.94	1.93	1.91	1.89	1.87	1.85	1.84	1.82	1.80	1.78	1.76	1.75	1.73	1.71
	Men (>65 years)	1.87	1.86	1.84	1.82	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.67
	Ulna length (cm)	32.0	31.5	31.0	30.5	30.0	29.5	29.0	28.5	28.0	27.5	27.0	26.5	26.0	25.5
HEIGHT (m)	Women (<65 years)	1.84	1.83	1.81	1.80	1.79	1.77	1.76	1.75	1.73	1.72	1.70	1.69	1.68	1.66
	Women (>65 years)	1.84	1.83	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.66	1.65	1.63
HEIGHT (m)	Men (<65 years)	1.69	1.67	1.66	1.64	1.62	1.60	1.58	1.57	1.55	1.53	1.51	1.49	1.48	1.46
	Men (>65 years)	1.65	1.63	1.62	1.60	1.59	1.57	1.56	1.54	1.52	1.51	1.49	1.48	1.46	1.45
	Ulna length (cm)	25.0	24.5	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0	18.5
HEIGHT (m)	Women (<65 years)	1.65	1.63	1.62	1.61	1.59	1.58	1.56	1.55	1.54	1.52	1.51	1.50	1.48	1.47
	Women (>65 years)	1.61	1.60	1.58	1.56	1.55	1.53	1.52	1.50	1.48	1.47	1.45	1.44	1.42	1.40

(BAPEN 2003)

APPENDIX 3: CROSS SITE ICU FEED INITIATION PROTOCOL



Full Version Control Record

Version:	2.0
Guidelines Leads:	Jaimeet Major, Katharine Reddy, Abigail Rixon (FHFT Dietitians)
Contributors:	Krishna Patel (Nutrition Support Nurse) Maneet Ahuja, Sophia Ahmad, Laura Johnson (ICU Pharmacists) Suman Shrestha (Nurse Consultant, ICU) (Consultant, ICU)
Lead Director / Chief of Service:	Melanie van Limborch, Chief of Nursing and Midwifery
Library check completed:	24/02/2025
Ratified at:	Therapies Clinical Governance 18 November 2025 FH Critical Care Clinical Governance Group (07/11/2025)
Date Issued:	23/12/2025
Review Date:	01/12/2028
Pharmaceutical dosing advice and formulary compliance checked by:	Maneet Ahuja 01/10/2025, Sophia Ahmad, Laura Johnson (ICU Pharmacists)
Key words:	ICU, Nutrition, Nutrition Support, Nutrition Oral Supplement, NG, NGT, NG feeding, NJ, PEG, RIG, Refeeding syndrome, Nasogastric, Nasojejunal, Enteral feeding, Nutrition screening tool, out of hours

This guideline has been registered with the Trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

This guideline is for use in Frimley Health NHS Foundation Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

Version Control Sheet

Version	Date	Guideline Lead(s)	Status	Comment
1.0	Dec 2022	FHFT Dietitians	Final	Adapted from FPH version 4 for cross-site use (2016) and updated.
1.1	January 2025	FHFT Dietitians	Interim	ICU feed initiation protocol updated to a cross-site protocol.
2.0	December 2025	FHFT Dietitians	Final	Update of version 1.0

Related Documents

Document Type	Document Name
Guideline	Nutrition screening and oral nutrition guidelines in adult inpatients
Guideline	Adult Enteral Nutrition Guideline
Guideline	Refeeding guidelines
Guideline	ICU Enteral feeding initiation protocol
Guideline	Adult Parenteral Nutrition Guideline

Guideline	Mealtimes (Including protected mealtimes and coloured trays)
Guideline	Insertion and on-going care of nasogastric feeding tubes in adults
Checklist	Invasive Procedure Safety Checklist: NG tube insertion
Checklist	ICU Risk Assessment for Nasogastric feeding in Adults
Policy	Food and drink Policy