

Summary

Originally developed as an evidence based guideline and implemented on Adult Intensive care at St James's Hospital in 1996. Reviewed in 2002 via a working group and implemented throughout Adult Critical Care CMT Leeds Teaching Hospitals NHS Trust (LTHT). The guidelines have been updated on a regular basis to incorporate new evidence and best practice and to standardise care across LTHT.

Scope

- Applicable to patients in level 2 and 3 areas of care who demonstrate a need for enteral feed as identified by the multi-disciplinary team.
- Applicable to all registered nurses working in level 2 and 3 areas who are required as part of their role to undertake feeding patients via the enteral route.
- These guidelines **do not** cover those requiring parenteral nutrition, where this is indicated see: [LINK](#)

These guidelines should be used in conjunction with:

- [Refeeding syndrome guidelines](#)
- [Bowel management](#)
- Nasogastric/Nasojejunal/Gastrostomy/Jejunostomy care plans WUN1237, WUN1235, WUN1236, WUN1182, WUN1114, WWG1046, WWG1036
- [Optimising cessation of enteral feeding for Critically Ill Adult patients with a protected airway undergoing off ward procedure](#)
- [Decanting feeds](#)

Aim

To provide an evidence based critical care enteral feeding guideline

Objectives

1. To help support decision making in the management of patients commencing enteral nutrition, when a dietitian is unavailable
2. To support the management of those patients who are at risk of refeeding syndrome when commencing enteral nutrition (in conjunction with the guidelines for managing adult patients at risk of refeeding syndrome).
3. To provide an expert opinion base to support clinical practice, knowledge and skills in the management of patients undergoing nutrition support via an enteral feeding tube

Establishing nutritional support

Malnutrition in critically ill patients is associated with increased morbidity and mortality. Nutrition support in critically ill patients is a “proactive therapeutic strategy” (ASPEN 2016) aiming to improve wound healing, reduce metabolic response to injury, improve gut structure and function, reduce length of hospital stay, improve clinical outcomes and provide cost savings.

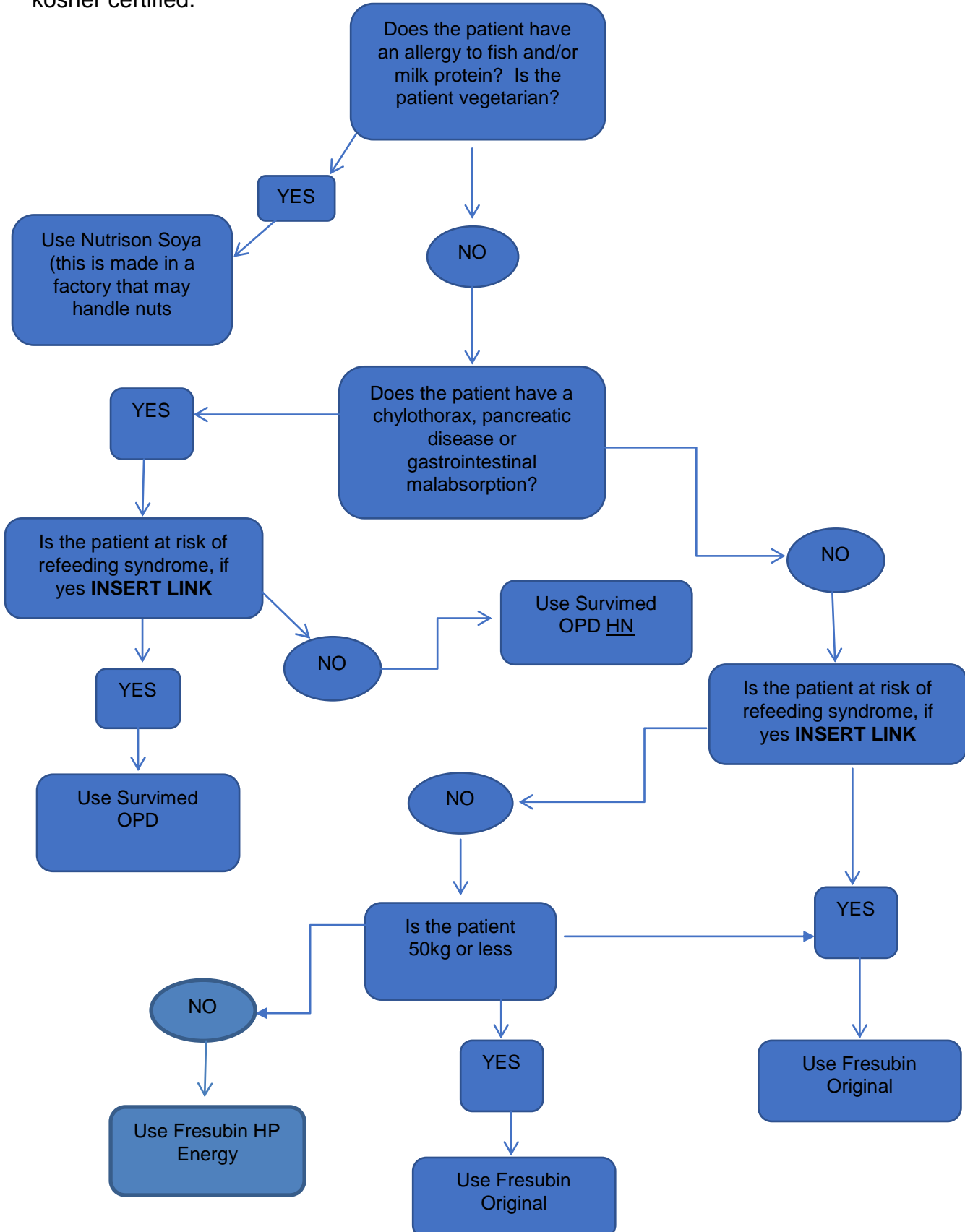
Detrimental effects can occur with both over and under feeding therefore it is crucial a prompt referral is made to the dietitian.

When oral intake cannot be established enteral feeding is the preferred route of nutrition for haemodynamically stable critically ill patients. Where possible, all patients should be nutritionally assessed and their requirements estimated prior to commencing tube feeding, this should be undertaken by a dietitian. At times when a dietitian is unavailable enteral feeding can commence using agreed starter regimens as soon as is indicated.

Commencing enteral feeding

Which enteral feed should I give to the patient?

Please note all the recommended feeds are gluten and lactose free. They are also halal and kosher certified.



Before Starting feed

What do I need to consider before starting the enteral feed?

1	Ensure the patient has consented to receiving an enteral feed via the appropriate route of feeding. If unable to consent, ensure it is documented as being in the patient's best interests
2	Check the patient has an appropriate care plan for the route of feeding you are using e.g. NG, Gastrostomy, NJ, Jejunostomy and follow the plan
3	Only radio-opaque nasogastric/orogastric tubes should be used for feeding Intensive Care patients; Ryle's tubes are not licenced for feeding and <u>should not</u> be used for this purpose.
4	Check it is safe to feed the patient using appropriate method/procedure for the required route of feeding
5	Check that a <u>referral</u> to a dietitian has been made to ensure a review can be completed in a suitable time frame
6	<p>If patient is at risk of <u>refeeding</u> syndrome ensure prescription of either</p> <ul style="list-style-type: none">• Pabrinex® (both vials) One pair IV once daily for 10days (if oral/enteral route cannot be used) <p style="text-align: center;">or</p> <ul style="list-style-type: none">• Thiamine (oral/enteral) 100mg TDS for 10 days Vitamin B co-strong 2 tablets TDS for 10 days and Forceval soluble OD (or a suitable alternative) for 10 days* <p>Please give the first dose before the enteral feed starts and continue for 10 days.</p> <p>Refer also to the refeeding guidelines: http://nww.lhp.leedsth.nhs.uk/common/guidelines/detail.aspx?ID=1926</p> <p>* For alcohol dependent patients, follow LTHT guideline as vitamin doses will differ</p>
7	Ensure the patient can receive adequate fluid for hydration. Please note the starter regimen will not provide adequate fluid within the first 2-3 days
8	Check most recent U & E, Calcium, Magnesium and Phosphate.

	Monitor levels and correct abnormalities and replace any deficiencies.
9	Document the name, date, time and rate of the selected feed in nursing notes OR ensure the doctors have prescribed on e-meds

Out of Hours Build-up Regimen for Enteral Feeding*

Day 1: 480ml of feed @ 20ml/hour for 24 hours

Day 2: 720ml of feed @ 30ml/hour for 24 hours

Day 3: 960ml of feed @ 40ml/hour for 24 hours **

* If feeding via nasojejunal or jejunostomy there is **no need** to check Gastric Residual Volume (GRV)

** Do not increase beyond this rate prior to dietetic review.

Note: For patients with potassium **above** the normal reference range who are **unlikely** to commence CVVHD, it may be appropriate to commence a concentrated feed such as Nepro HP. Liaise with Dietitian as needed.

STARTING ENTERAL FEED

Establish suitability for enteral feeding with MDT and assess needs with/refer to Dietitian.
Liaise with medical/surgical team if patient has had complex GI surgery and may be at risk of enteral feed intolerance.

Confirm correct position of feeding tube as per relevant [LTHT policy](#)

Commence continuous feed at 20ml/hr. Use decision flow chart to identify correct feed to administer.
Check gastric residual volume (GRV) after 6 hours. GRV to be checked at 6 hourly intervals 6am, 12MD, 6pm and 12am.
If started between these times check GRV at the next specified time.

6 hourly GRV

For **General ICU/HDU** <500ml and no recorded vomiting.
For **Cardiac and Neuro ICU/HDU** <350ml and no recorded vomiting.

YES

NO

Replace GRV to unit maximum (350/500ml) and continue to increase feed rate to 30mls/hr after 24hr **or** where available, at the rate as per dietitian's regimen.

Replace GRV to unit maximum (350/500ml) and maintain feed at current rate.
Recheck at next 6 hourly interval.

6 hourly GRV

For **General ICU/HDU** <500ml and no recorded vomiting.
For **Cardiac and Neuro ICU/HDU** <350ml and no recorded vomiting.

YES

NO

Replace GRV to unit maximum (350/500ml) and continue to increase feed rate to 40mls/hr after 24hr **or** where available, at the rate as per dietitian's regimen.

Replace GRV to unit maximum (350/500mls) & discuss with medical staff/dietitian. Commence prokinetics as per [LTH Enteral Feeding Guidelines](#)

6 hourly GRV

For **General ICU/HDU** <500ml and no recorded vomiting.
For **Cardiac and Neuro ICU/HDU** <350ml and no recorded vomiting.

YES

NO

Review prokinetic therapy after 48hrs

If after 48hrs GRV still >350/500mls, post-pyloric feeding should be considered. Liaise with medical staff and dietitian re further management.

Notes:

- GRVs should be monitored in conjunction with clinical parameters to assess tolerance of enteral feeding. Seek advice from medical team/dietitian and consider stopping feeding if there are overt signs of intolerance:
 - Regurgitation
 - Aspiration
 - Patient reported nausea
 - Bowels not open
 - Vomiting
 - Abdominal distension
- It is the responsibility of the individual clinician to ensure that GRV is monitored appropriately in conjunction with additional clinical parameters to assess tolerance of enteral feeding. Excessive reliance on GRV as a marker to direct care should be avoided.
- Review the need for stress ulcer prophylaxis as per [LTHT policy](#)
- All patients who are enterally fed should be referred to the [dietitian](#)
- Patients requiring parenteral nutrition will require a referral to the [nutrition team](#)
- Review prokinetics if the patient develops loose stools (refer to Bristol stool chart)

If the patient is not tolerating feed:

- Has anything changed clinically?
- Re-check for contraindications
- Is the patient receiving sedatives, paralysing agents, opioids or inotropes/vasopressors (these will decrease motility)?
- Are bowels open/stomas functioning? Do they require aperients?
- Could the patient have an ileus or a bowel obstruction?
- Is the patient supine? Could they be repositioned at 30-45°?
- Re-check feeding tube position
- Consider prokinetics
- Consider possible medication side effects

Prokinetics

- The most commonly used prokinetic medicines are Metoclopramide and Erythromycin.
- When used as a single agent Erythromycin is the more effective medicine.
- Both drugs are prone to tachyphylaxis (gradual loss of effect). This is less likely if the two drugs are used in combination.
- Concerns about bacterial resistance and drug interactions with Erythromycin mean that despite this evidence above, it is usually added in as a second line therapy when Metoclopramide is unsuccessful and/or contraindicated (Grant & Thomas, 2009; Nguyen et al 2007; ESPEN 2006).
- There are relatively few well designed comparative studies of prokinetic therapy in the critically ill. In most these studies the medicines were given intravenously and as a result there is insufficient data to support enteral administration in preference to intravenous (ASPEN, 2016; Espen 2006; Grant K and Thomas R 2009).
- There is little consensus on the dose of these agents (particularly erythromycin). For safety metoclopramide doses should not exceed 30mg/day. (Grant & Thomas, 2009)
- The recommended treatment is therefore
 - Metoclopramide IV 10mg TDS.
 - If there is no response after 48 hours
 - Add in IV Erythromycin 250mg BD.
 - Review again after 48 hours and continue for a further 2 days if necessary.
- Prokinetic medicines should be stopped as soon as enteral absorption is established.

Contra-indications:

Erythromycin – increased risk if given with drugs known to prolong QTc interval, drug interactions (see below)

Metoclopramide – caution in severe renal or hepatic insufficiency. Avoid in gastrointestinal obstruction, perforation or haemorrhage and parkinson's disease.

Drug Interactions

Erythromycin

Erythromycin reduces metabolism of many medicines resulting in increased concentrations and toxicity. e.g. atorvastatin, carbamazepine, ciclosporin, digoxin, phenytoin, simvastatin, tacrolimus, theophylline, sodium valproate, and warfarin. It should be avoided in patients receiving any of these medicines. Contact pharmacy if this is problematic.

Diarrhoea

If introduced slowly and monitored carefully enteral feeding, is an unlikely cause of diarrhoea. If diarrhoea occurs, tube feeding should not be stopped and other potential causes investigated. Intravenous fluids may be required to prevent dehydration.

Other causes include: (this is not an exhaustive list)

- Gastrointestinal (GI) infection such as clostridium difficile
- Small bowel atrophy can occur when the GI tract has been unused for as little as two or three days, leading to malabsorption
- High osmolality feeds
- Pancreatitis
- Bacterial contamination of feeds

Medications that can contribute to diarrhoea include:

- Oral Potassium, magnesium and other electrolyte supplements
- Laxatives
- Drugs containing sorbitol e.g Digoxin, Metoclopramide, Theophylline, Furosemide
- Ursodeoxycholic acid
- Proton pump inhibitors e.g. lansoprazole, omeprazole
- Antibiotics - particularly clindamycin

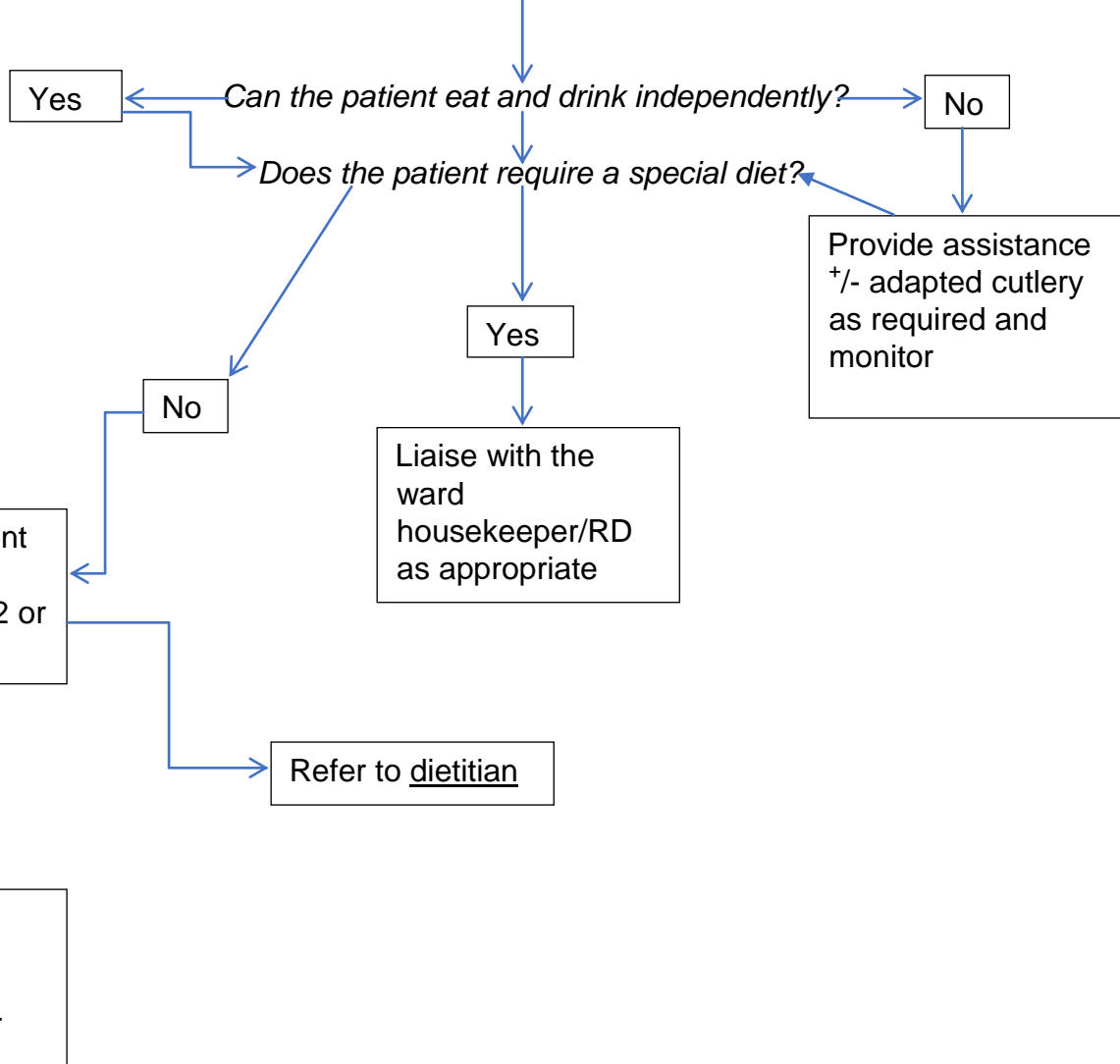
Discontinue any contributing medication if possible

If other causes of diarrhoea are ruled out liaise with the dietitian as to whether it is appropriate to change the enteral feed or feeding rate

For the treatment and management of diarrhoea refer to the LTHT local ICU guidelines ([Bowel management in critical care](#)).

For those who can safely eat and drink

Commence Oral Nutrition Care Plan



Hypernatraemia

Hypernatraemia is defined as a serum sodium concentration above 146mmol/L. Treatment depends on the underlying cause and whether there is overall fluid depletion or sodium excess. Efforts should be made to identify and rectify the underlying cause and this should be interpreted with knowledge of fluid balance and medication.

- Liaise with medical team
- Stop causative agents
- Consider calculating the estimated total body water deficit
- Urinary sodium may be helpful in complex cases with gastrointestinal fluid loss

Enteral water replacement should be considered first line. A suggested starting rate is 50ml/hr .

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