

Mistakes in jejunal feeding and how to avoid them

Ashley Bond and Simon Lal

Jejunal feeding is an important means to support nutrition and hydration in patients who have impaired oesophagogastric access and function, but in whom the small bowel remains both accessible and functioning. However, jejunal feeding is not always a straightforward intervention and can be fraught with pitfalls. Awareness of these pitfalls, together with advance consideration and planning to mitigate problems, can improve outcomes. Although jejunal feeding is a well-established and common modality for the administration of artificial nutrition support, the evidence base supporting its use is limited. The majority of this discussion is, therefore, pragmatic and based on the authors' experience in clinical nutrition, with reference to the literature where available.



Mistake 1 Not involving a multidisciplinary nutrition support team

When managing a patient who may require long-term enteral feeding, involvement of a nutrition support team (NST) is recommended by both the UK National Institute for Health and Care Excellence (NICE) and the European Society of Parenteral and Enteral Nutrition (ESPEN) guidance.^{1,2} Indeed, it is recommended that all hospitals providing acute care should have a multidisciplinary NST.^{1,2} Failure to adopt this approach can result in a nonstandardised approach to decision making and worse patient outcomes. The optimal NST includes medical clinical nutrition specialists, nutrition nurses, dietitians, clinical psychologists (and on, occasion, liaison with psychiatrists, particularly if disordered eating is suspected) and pharmacists, with access to radiologists, clinical biochemists and surgeons as needed. The available literature reports the potential for improved patient outcomes when NSTs form the basis of an enteral nutrition service.²⁻⁴ In particular, NSTs should assess the suitability of different feeding routes and advise on alternative treatment options (see Mistake 2).

Mistake 2 Overlooking jejunal feeding as the optimal feeding route

Jejunal feeding should not be overlooked when considering the optimal route for nutritional support. For individuals who have gastric pathology and a functioning small bowel, jejunal feeding may be preferable to avoid the unnecessary use of parenteral nutrition, given the inherent risk associated with central venous

catheters and parenteral nutrition in general.⁵ Similarly, clinicians should consider jejunal feeding as the route of choice in some other settings; for example, the postpyloric route may be preferable in the critical-care setting to reduce the risk of pneumonia.⁶

Mistake 3 Placing a permanent tube without trialling nasojejunal feeding

In the majority of cases, the first choice for jejunal feeding will be a nasojejunal (NJ) feeding tube (figure 1). Proceeding straight to placement of a long-term invasive tube (e.g. via direct puncture percutaneous endoscopic jejunostomy [PEJ] or percutaneous endoscopic gastrojejunostomy [PEG-J], figure 1) is not advisable, since tolerance and evidence of improvement in nutritional status should be demonstrated in order to risk stratify invasive tube placement. NJ tubes can be placed radiologically, endoscopically and in some instances are self-propelling.⁷ Given that these tubes will often be required to maintain a stable position for a number of weeks, we recommend inserting a nasal bridle at the time of NJ tube insertion and recording the position of the feeding tube at the nose (using the tube centimetre markings). The nasal bridle improves stability and reduces accidental dislodgement, and it can improve the patient's tolerance of the tube by limiting pharyngeal movements.⁸

There are circumstances in which initial insertion of an invasive jejunal feeding tube may be appropriate; namely, following resection of an upper gastrointestinal cancer.⁹ Even in the latter case, however, postoperative dependence on jejunal feeding can be highly variable and surgically-placed tubes can be associated with

complications, including small bowel volvulus.¹⁰ ESPEN guidance recommends that placement of an NJ tube or needle catheter jejunostomy be considered for all tube feeding candidates who are undergoing major upper gastrointestinal and pancreatic surgery, with special regard to malnourished patients.⁹ Assessment for risk of pre- and postoperative malnutrition should take place in order to guide the decision regarding jejunostomy. In case of a major complication with relaparotomy, the use of an NJ tube or needle catheter jejunostomy may be considered.⁹

Mistake 4 Too early or inappropriate jejunal feeding

Proceeding too readily to jejunal feeding in patients who have no structural intestinal pathology and predominantly functional symptoms, such as nausea, vomiting and pain, but who are not malnourished is a common pitfall. In this patient group there is a range of possible functional diagnoses to consider and address and, in many of these patients, jejunal feeding can unnecessarily add to the complexity of their care with the potential for medical iatrogenesis. When adopted in these circumstances, there is a risk of losing the primary evidence-based indication for jejunal feeding, which is to address malnutrition, while instead focussing on trying to improve foregut functional symptoms.

Nutritional approaches for patients with gastrointestinal motility disorders should first trial oral nutrition. For patients who progress to enteral or parenteral feeds, the primary aim should be to maintain or reinstate oral intake to reduce morbidity and mortality risk.¹¹ The specific features of certain functional foregut disorders need to

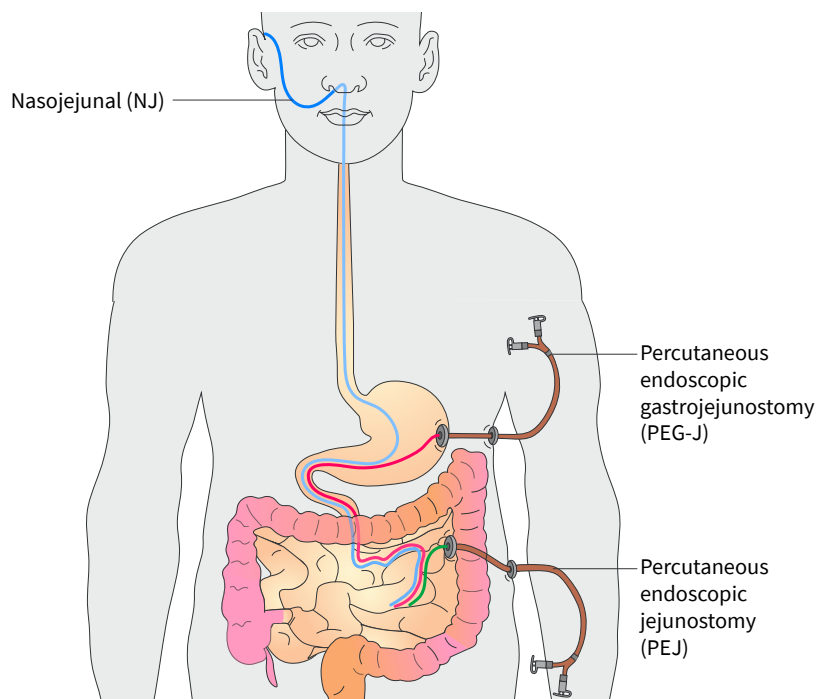


Figure 1 | Jejunal feeding via a nasojejunal (NJ) feeding tube (blue), percutaneous endoscopic gastrojejunostomy (PEG-J) tube (pink) or a percutaneous endoscopic jejunostomy (PEJ) tube (green).

be considered carefully before jejunal feeding is adopted. Jejunal feeding is frequently poorly tolerated in those who have centrally mediated abdominal pain and narcotic bowel syndrome. Conversely, those with gastroparesis and malnutrition are likely to gain the most from jejunal feeding.

Patients who have underlying but yet-to-be-diagnosed eating disorders or atypical eating behaviours are being referred initially more frequently to gastroenterology services. Such disorders will often present as an existing low BMI, progressive weight loss and/or vomiting. If the primary reason for jejunal feeding is actually an eating disorder and this is not recognised by the NST, then the likelihood that the therapeutic goals will be achieved is remote and the primary pathology may go untreated. Thus, gastroenterologists and NSTs should engage the appropriate psychology and psychiatric services early if there is suspicion of an underlying mental health disorder.

Mistake 5 Incorrect selection or insertion of a permanent tube

If a patient has proven tolerance and improved nutritional status with NJ tube feeding, together with long-term dependence, then there are a number of potential errors that can be made relating to permanent tube selection.

First, the method of insertion of a transgastric tube endoscopically (PEG-J tube) or radiologically inserted percutaneous gastrojejunostomy (RIG-J tube)—should be carefully considered. If there is no cardiorespiratory or anatomical reason to

preclude endoscopic placement, then we would recommend this as the first choice, as reported outcomes can be worse for radiologically sited tubes.¹²

Second, PEG-J tubes in general have somewhat better stability and longevity than RIG-J tubes and usually have better gastric venting ports. Of the commercially available PEG-J tube options, however, some have more stable jejunal extension attachments than others and some have a greater risk of buried bumper than others. It is important to be familiar with the pros and cons of each option for optimal tube selection.

A further mistake is insertion at an insufficiently distal gastric site for the PEG-J tube, which worsens the stability of the jejunal extension, thus increasing chances of tube dislodgement back into the stomach. If local expertise permits, then a direct PEJ using device-assisted enteroscopy is less invasive than surgical jejunal feeding tube insertion, and may be more stable than PEG-J, but does not allow for gastric venting (which may require the additional placement of a gastric tube).

Mistake 6 Starting with an initial feeding rate that's too fast

Enteral feeding must be commenced slowly after jejunal tube placement. An initial trial of 0.9% w/v sodium chloride at 10mL/hour for the first 24 hours after insertion is recommended, with a gradual introduction of enteral feed, increasing the rate as tolerated and also in keeping with the management of any refeeding risk.² For those

patients at risk of refeeding syndrome it is vital that feeding is commenced at the recommended amount and rate, and that they receive appropriate thiamine supplementation and undergo close blood monitoring with replenishment of electrolyte deficits in keeping with local and national guidelines.¹³

Mistake 7 Failing to manage symptoms following a rate increase

Patients may be intolerant of larger rates and volumes of feed, presenting with symptoms of nausea, bloating, pain and diarrhoea. The use of prokinetics and laxatives, where appropriate, may be beneficial to facilitate increments in jejunal feeding rates. Antiemetics may also be required.

In those patients who have diarrhoea, alternative feeds can be trialled along with antidiarrhoeal agents, as needed. Factors related to enteral-tube-associated diarrhoea should be considered, including the feed formulation used, the manner of administration, or bacterial contamination.¹⁴ Early and frequent access to experienced dietitians to stagger increment rates when needed and consider switching feed types should be available. To ensure that nutritional requirements are met, and the appropriate treatment administered, all possible causes of diarrhoea should be considered and appropriate measures taken before discontinuing feed.¹⁴

Occasionally, therapy for presumed small intestinal overgrowth can also improve feed tolerance, particularly in those who have underlying intestinal dysmotility. In patients who have pancreatitis requiring jejunal feeding or those who have undergone Roux-en-Y reconstruction, awareness of the possibility of pancreatic enzyme insufficiency or poor enzyme mixing should prompt the addition of pancreatic enzyme supplementation to the feed to reduce any malabsorption. Support from clinical psychology services can help patients when they are adapting to long-term feeding requirements.

Mistake 8 Not reviewing and optimising medications following jejunal tube placement

Optimising medication to manage symptoms is a crucial component of enhancing tolerance to jejunal feeding. For example, the use of opioids should be minimised, particularly in those who have functional gastrointestinal disorders, owing to their negative effects on gastrointestinal motility. Consequently, early engagement of a chronic pain team is important, with consideration given to alternative pain therapies such as those targeting neuropathic pain. Furthermore, careful liaison with a pharmacist is essential because all medications that are to be administered via the

enteral tube should be assessed for their risk of causing tube blockage, as well as their suitability for jejunal absorption. Water should be flushed into the jejunal tube before and after medication administration, and completely solubilised and liquid medication options should be used, wherever possible.

Mistake 9 Failing to pre-empt, recognise and address complications

When considering specific tube-related complications, the most commonly encountered are leakage, obstruction, displacement, local stoma complications and digestive intolerance. A robust system of community-based care and follow up must be in place to support patients after hospital discharge and to ensure complications are recognised and managed in a timely manner (see also Mistake 10).¹

Displacement of NJ tubes is a frequent issue, with the tip recoiling into the stomach or the whole tube being removed nasally. Such displacement may require repeated insertions and the patient should be informed of this prior to the initial insertion, in order to set their expectations appropriately. Tube displacement should be promptly recognised when following management protocols in hospital or in the community² and/or if the patient is vomiting enteral feed. Patients with repeated NJ tube displacement should have their case discussed with the NST to ensure ongoing replacement is appropriate or to consider an alternative route when needed.

Displacement is not limited to NJ tubes and may be a frequent issue with PEG-J tubes as the jejunal extension recoils into the stomach. Such issues may be pre-empted by appropriate patient selection (e.g. excluding those with significant small bowel dysmotility), medication optimisation (e.g. administering prokinetics and avoiding opioids) and tube placement (e.g. low antral site). However, even when all of these aspects have been considered, tube displacements may still occur. At this stage consideration might be given to clipping of the jejunal tube,¹⁵ changing to a weighted radiology transgastric tube or switching to a PEJ or surgical jejunostomy.

A lack of awareness of the risk of developing buried bumper with some types of PEG-J tube can lead to inadequate aftercare. The PEG-J tube should be advanced and retracted daily to reduce the risk of buried bumper, but it should not be rotated since this would dislodge the jejunal extension.

Peristomal leakage can be a particular problem with poorly vented PEG-J tubes and with direct jejunal placement. A mistake here is to increase the tube size/diameter in the tract in an attempt to reduce leakage; this will tend to lead to

gradually increasing tract size/diameter and potentially worsened leakage. Instead, venting the stomach where possible and the use of peristomal barrier creams, stoma bags and stoma cones can help. Venting the stomach consists of actively aspirating the gastric content. This can be performed by the patient at set intervals or when they have symptoms of nausea or pain. Re-siting the tube may simply result in a recurrence of the problem at another site and risk leaving a permanent enterocutaneous fistula.

Mistake 10 Inadequate long-term follow-up

Unscheduled healthcare contact is a frequent occurrence for patients receiving community-based jejunal feeding. Therefore, a robust system for community-based care and follow-up must be in place.¹ ESPEN also recommend defined pathways and procedures to ensure efficacy of feeding and the assessment of body weight, body composition, hydration, muscle strength and performance, together with nutritional intake.² The systems put in place should also assess feed tolerance and manage tube-related complications.² Failure to ensure community and hospital NST follow-up can lead to poor therapeutic effect, increased complications, patient morbidity and increased hospitalisations.

References

1. National Collaborating Centre for Acute Care. NICE Clinical Guideline 32. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition. February 2006.
2. Bischoff SC, Austin P, Boeykens K, et al. ESPEN guideline on home enteral nutrition. *Clin Nutr* 2020; 39: 5–22.
3. Hvas C, Farrer K, Blackett B, et al. Reduced 30-day gastrostomy placement mortality following the

introduction of a multidisciplinary nutrition support team: a cohort study. *J Hum Nutr Diet* 2017; 31: 413–421.

4. BAPEN. Organisation of food and nutritional support in hospitals. Nutrition Support Team(s). <https://www.bapen.org.uk/ofnsh/OrganizationOfNutritionalSupportWithinHospitals.pdf> (2019, accessed 25 August 2020).
5. Seres DS, Valcarcel M and Guillaume A. Advantages of enteral nutrition over parenteral nutrition. *Ther Adv Gastroenterol* 2013; 6: 157–167.
6. Alkhwaja S, Martin C, Butler R, et al. Post-pyloric versus gastric tube feeding for preventing pneumonia and improving nutritional outcomes in critically ill adults. *Cochrane Database Syst Rev* 2015; 8: CD008875.
7. Pearce CB and Duncan HD. Enteral feeding. Nasogastric, nasojejunal, percutaneous endoscopic gastrostomy, or jejunostomy: its indications and limitations. *Postgraduate Medical Journal* 2002; 78: 198–204.
8. Lynch A, Tang CS, Jegathanan LS, et al. A systematic review of the effectiveness and complications of using nasal bridges to secure nasoenteral feeding tubes. *Aust J Otolaryngol* 2018; 1: 8.
9. Weimann A, Braga M, Carli F, et al. ESPEN guideline: clinical nutrition in surgery. *Clin Nutr* 2017; 36: 623–650.
10. Blakely A, Ajmal S, Sargent R, et al. Critical analysis of feeding jejunostomy following resection of upper gastrointestinal malignancies. *World J Gastrointest Surg* 2017; 27: 53–60.
11. Lehmann S, Ferrie S and Carey S. Nutrition management in patients with chronic gastrointestinal motility disorders: a systematic literature review. *Nutr Clin Pract* 2020; 35: 219–230.
12. Vidhya C, Phoebe D, Dhina C, et al. Percutaneous endoscopic gastrostomy (PEG) versus radiologically inserted gastrostomy (RIG): a comparison of outcomes at an Australian teaching hospital. *Clin Nutr ESPEN* 2018; 23: 136–140.
13. National Collaborating Centre for Acute Care. NICE Clinical Guideline 32. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition. February 2006 (updated July 2017).
14. Eisenberg PG. Causes of diarrhea in tube-fed patients: a comprehensive approach to diagnosis and management. *Nutr Clin Pract* 1993; 8: 119–123.
15. Frizzell E and Darwin P. Endoscopic placement of jejunal feeding tubes by using the Resolution clip: report of 2 cases. *Gastrointest Endosc* 2006; 64: 454–456.

Your jejunal feeding briefing

UEG week

- 'Therapeutic nutrition in IBD' session at UEG Week 2019 [<https://ueg.eu/library/session/therapeutic-nutrition-in-ibd/156/2150>].
- 'Nutritional support' presentation in the 'From guidelines to clinical practice: Oesophageal malignant strictures' session at UEG Week 2019 [<https://ueg.eu/library/session/from-guidelines-to-clinical-practice-oesophageal-malignant-strictures/156/2225>].
- 'Motility disorders: Nutritional treatment' presentation in the 'Anorexia and unexplained weight loss session at UEG Week 2019 [<https://ueg.eu/library/session/anorexia-and-unexplained-weight-loss/156/2136>].
- 'Percutaneous gastrostomy and jejunostomy' session at UEG Week 2016 [<https://ueg.eu/library/session/percutaneous-gastrostomy-and-jejunostomy/144/1654>].

Standards and Guidelines

- Bischoff SC, Austin P, Boeykens K, et al. ESPEN guideline on home enteral nutrition. *Clin Nutr* 2020; 39: 5–22 [[https://www.clinicalnutritionjournal.com/article/S0261-5614\(19\)30198-0/fulltext](https://www.clinicalnutritionjournal.com/article/S0261-5614(19)30198-0/fulltext)].
- Weimann A, Braga M, Carli F, et al. ESPEN guideline: clinical nutrition in surgery. *Clin Nutr* 2017; 36: 623–650 [<https://ueg.eu/library/espen-guideline-clinical-nutrition-in-surgery/173891>].
- National Collaborating Centre for Acute Care. NICE Clinical Guideline 32. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition. February 2006 (updated July 2017) [<https://www.nice.org.uk/guidance/cg32/evidence/full-guideline-194889853>].
- BAPEN. Organisation of food and nutritional support in hospitals. Nutrition Support Team(s). [<https://www.bapen.org.uk/ofnsh/OrganizationOfNutritionalSupportWithinHospitals.pdf>] (2019, accessed 25 August 2020).