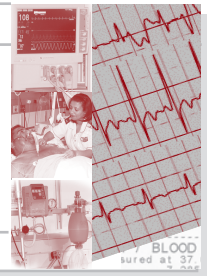


Enteral nutrition in the critically ill – a nursing update



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As an independent critical care nurse educator, the author works with students in critical care units across the Cape Peninsula including those in both the government and the major private hospital groups. One noticeable problem identified in all these units is the apparent lack of nursing knowledge and practice guidelines with regard to the initiation of enteral feeding. This leads to inconsistency with regard to feeding, which in turn results in compromised nutritional goals.

It is now accepted that early enteral nutrition is not simply a means of preventing starvation but also leads to improved immunity and outcome in critically ill patients.¹⁻⁴ It is not only important that feeds are commenced early but also that patients receive the correct amount of nutrients as soon as possible. McClave *et al.*³ found that poor delivery of prescribed feeds resulted in patients receiving only 78% of the volume ordered. In a more recent report Heyland *et al.*⁵ indicate that in Canada patients on average receive only 58% of their prescribed amounts of calories and protein over the first 12 days in the intensive care unit. Kirkland⁶ suggests that because the delivery of enteral feeding is a nursing task, one way of ensuring that patients receive appropriate enteral nutrition is to ensure proper education of nurses and to develop enteral feeding protocols. This paper attempts to debunk many of the misconceptions the author has encountered with regard to enteral feeding and so improve the delivery of nutrients to this vulnerable group.

Deciding when to begin

Feeding should start within 6 hours of ICU admission.⁷ While enteral feeding is usually initiated and prescribed by the attending doctor, it is a nursing responsibility to prompt the doctor if necessary. As it is not possible to predict accurately which patients will have prolonged ICU stays, it is important that all patients be fed early. Marik and Zalago⁸ in a meta-analysis of 15 nutritional trials comparing early and delayed enteral feeding found that early feeding reduced the episodes of infective complications and length of hospital stay in critically ill patients. In addition Heyland *et al.*² report that patients receiving early enteral nutrition have better wound healing.

The only absolute contraindications to enteral feeding are bowel obstruction, perforation and intestinal ischaemia.⁷ Heyland *et al.*² found that enteral feeding was often incorrectly withheld because of absence of bowel sounds, large nasogastric drainage, and other conditions previously considered contraindications to this form of feeding such as pancreatitis, gastrointestinal (GI) bleeding and GI surgery. Bowel sounds occur because of swallowed air moving in the bowel and are often absent or faint in the mechanically ventilated patient, even when the bowel is functioning normally. Bowel sounds therefore should not form part of the assessment of critically ill patients for enteral feeding.⁹⁻¹¹ Feeding above an anastomosis does not lead to an increase in anastomosis breakdown, while it does improve bowel function. Feeding also offers the best protection against gastric bleeding in this high-risk group.^{7,11} Gastric emptying can be delayed for a number of reasons, which include the use of opiates and inotropes as well as acidosis and electrolyte disturbances.¹² High residual volumes are therefore frequently found in patients with hypoperfusion states and in those receiving sedation and catecholamines,¹³ and only persistent residual volumes of over 200 ml should be regarded as indicating intolerance to enteral feeding.¹¹

Choosing the method

In the already immunocompromised critically ill patient the nasal route for nasogastric feeding should be avoided because of the increased risk of sinusitis and systemic sepsis.⁷ Orogastric tubes are preferable but require careful nursing care as they are more easily displaced. Fine-bore tubes are not recommended during the initiation of enteral feeding as it is not possible to aspirate through them, making the assessment of residual gastric balance impossible.

Intermittent and continuous enteral feeds are equally well tolerated in the critically ill patient.^{14,15} Continuous feeds are less time consuming and therefore the most common method of feeding in the ICU. These are best delivered through a feeding pump, but it is possible to administer continuous feeds without a pump. There also appears to be no benefit in allowing for an overnight rest period during enteral feeding,^{7,16} and the prescribed feed should therefore be delivered over 24 hours.

A discussion of the different types of enteral feeds used for the critically ill does not fall within the scope of this paper, as the doctor and dietician are usually responsible for prescribing feeds. Most patients do not require expensive feeds and do well on a standard isotonic formula containing fibre.⁷ There is no advantage in giving the patient water or diluted feed when initiating feeding, and this practice leads to the delivery of insufficient nutrients. It is recommended that one commence at 30 ml per hour or 0.5 ml/kg/hour^{7,17} and check for tolerance by aspirating every 4 hours.

Assessing residual volumes

It is not necessary to wait for a period of time before aspirating. Doing this will result in the patient not meeting nutritional goals. Simply stop the feed and aspirate! Many nurses think that the residual volume should be less than 50 - 100% of the feed delivered during the preceding 4 hours. This is incorrect. The amount of residual volume considered acceptable varies, with reported volumes ranging from less than 140 ml⁷ to 250 ml and 300 ml.^{18,19} High residual volumes are an isolated occurrence 80% of the time.⁷ It would appear that utilising higher residual volumes does not carry any increased risk while allowing for a reduced time to reach the patient's nutritional goal, especially if used in conjunction with a prokinetic agent such as metoclopramide or erythromycin.¹⁸ The accepted residual volume in the majority of British hospitals is 200 ml.^{4,9,17}

If less than 200 ml is aspirated the rate should be increased to 60 ml per hour. Many authors^{7,9} recommend that the first 200 ml of aspirate be returned to ensure that the patient receives all the prescribed feed. However in practice this is difficult to do, carries the risk of contamination and is repulsive to many nurses. If not returned to the stomach it is important that the aspirated volume be documented as output on the fluid balance chart. Continue at the increased rate for another 4 hours and repeat the procedure; if the aspirate is again less than 200 ml, increase the rate by 30 ml per hour until the maintenance rate is established. Once feeding has been established for 24 hours it is not necessary to continue assessing residual volumes, provided the patient is stable and there has been minimal residual volume after each aspiration.⁹

If after 4 hours more than 200 ml is aspirated, the rate of delivery should not be increased but continued at the same level for a further 4 hours. If the aspirate remains over 200 ml the rate should be kept at 30 ml per hour and the doctor consulted about prescribing metoclopramide or erythromycin; both drugs promote gastric emptying and improve the chance of successful establishment of enteral nutrition.²⁰ If after 24 - 48

hours you have failed to initiate feeding, the infusion rate should be reduced to 10 ml per hour and alternative methods of feeding considered.

Preventing complications

The single most important way in which aspiration- and ventilator-associated pneumonia can be prevented in patients receiving enteral feeding is to elevate the head to 45° or 'semi-Fowler' position.^{7,21,22} In reality most critically ill patients, regardless of their haemodynamic status, are either nursed flat or with the head only slightly elevated. The prone position is not a contraindication to enteral feeding.¹²

Patients going to surgery or for an investigation and those who are being weaned from the ventilator do not have to have enteral feeds stopped hours in advance. The stomach can simply be emptied when necessary. Patients who develop diarrhoea also should not have their feed automatically stopped.

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