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Critical Care Nutrition

Nutrition Information Byte (NIBBLE)

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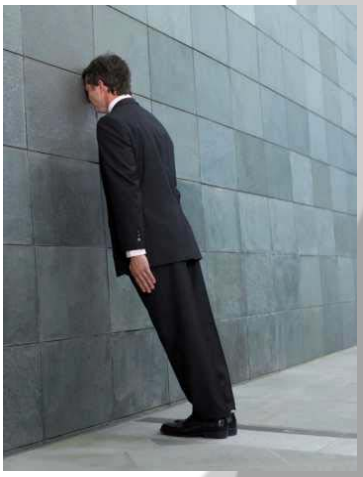
Enteral Feeding and the Critically Ill Patient with Intestinal Surgery

There is a **strong rationale** for providing early enteral nutrition (EN) to critically ill surgical patients. **Early EN reduces the inflammation, oxidative stress, and catabolic response to anaesthesia and surgical-induced stress(1). As well, it helps restore intestinal motility (2); maintain gut mucosa which is linked to improved immunologic function(3), and reverse enteric mucosal atrophy. Early EN has also been associated with improved surgical wound healing (5-7) and improved epithelial cell function (4).** There are 14 randomized controlled trials comparing early EN to delayed EN. When results of these studies were aggregated, early EN was associated with a significant reduction in infectious complications (Relative Risk (RR) 0.76, 95 % confidence intervals (CI) 0.59, 0.98, p = 0.04) and a trend towards a reduction in mortality (RR 0.68 95% CI 0.46,1.01, p =0.06) (8). Four of these trials were in critically ill surgical patients, suggesting these results are directly applicable to these kinds of patients (9). Yet, despite these data, in a recent international multicenter audit, we observed that mechanically ventilated **critically ill surgical patients, compared to medical patients, were less likely to receive EN and more likely to receive parenteral nutrition** (PN). Among patients initiating EN in ICU, surgical patients started EN 21.0 hours later on average (57.8 vs. 36.8 hrs, p<0.0001) thus, missing the potential benefit of early EN. In addition, surgical patients received less of their prescribed calories from EN (33.4 vs. 49.6%, p<0.0001) (8). Of all surgical patients, those having undergone recent intestinal surgery were the worst fed amongst all surgical patients. It appears that efforts need to be directed at improving the provision of enteral nutrition to critically ill surgical patients.

Perceived Barriers



Many surgeons are concerned about the safety of early EN and how their patients will tolerate it, particularly after recent gastrointestinal (GI) surgery. A recent meta-analysis of 13 RCTs comparing early vs delayed EN in 1,173 patients undergoing elective demonstrated that hospital mortality was reduced with early post-operative feeding (RR 0.41 95% CI 0.18,0.93, p=0.03). The findings were also suggestive of a reduction in post-operative infectious complications (RR 0.77 95% CI 0.48,1.22, p=0.26), and a reduction in hospital length of stay (weighted mean difference -0.60, 95% CI -66,-0.54). Surgeons are often reluctant to feed their newly post-operative intestinal surgery patients over concern for anastamotic breakdown. However, the weight of the literature demonstrates a trend towards reduced anastamotic dehiscence with early feeding (RR 0.69 95% CI 0.36,1,32, p=0.27). However, early feeding was associated with a trend towards an increase in vomiting (RR 1.27, 95% CI 1.01,1.51). Admittedly, the control group mortality was 6.8% so these data may not be directly applicable to all critically ill surgical patients. On the other hand, the **benefits of early EN have been shown to be greater in sicker patients** compared to less sick patients (11-13), so likely the benefits of early EN apply the most to sick, surgical, critically ill. Another reason to withhold early EN is the risk of vomiting, aspiration, and pneumonia. The data are conflicting here with some studies showing better fed patients having a lower rate of pneumonia and overall infection whilst other studies do suggest an increased rate of pneumonia with early EN(8, 14, 15). However, despite this increased rate of pneumonia, however, the overall ICU and hospital mortality is lower in patients that receive early EN(14).

On balance, then, **the benefit of early EN in the surgical patient (reduced hospital mortality and reduced complications) outweigh the risks**, which can be further minimized by other interventions, such as elevation of head of bed, small bowel tubes, motility agents, and subglottic secretion drainage tubes that minimize the risks of aspiration and pneumonia.

Summary

- In critically ill patients early EN reduces inflammation, oxidative stress, catabolic response to surgery/anaesthesia, maintains gut mucosa, and leads to improved wound healing
- Early EN has been shown to significantly reduce hospital mortality, infectious complications, and hospital length of stay
- Sicker surgical patients are more likely to benefit from early EN

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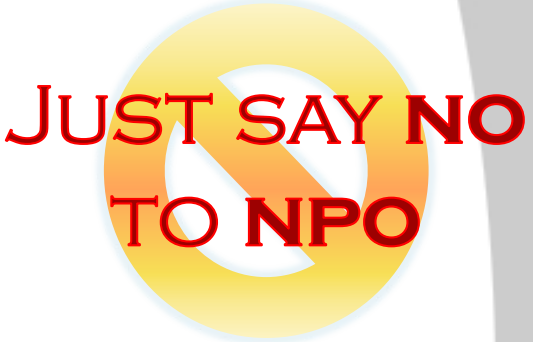
Strategies to improve nutrition practice in surgical patients

Feeding protocols, use of motility agents, and small bowel feedings have been shown to improve nutrition delivery to critically ill patients and this may be pertinent to improving nutrition delivery to surgical patients. With advance preparation and coordination, ideally, small bowel access can be obtained intra-operatively. The risks of early EN are mostly associated with high volume, intragastric EN (16). An alternative, safer approach may be to provide trophic feeds (10-20 ml/hr) for 24 hours then reassess whether regular volume feeds can be provided. Unless there is an absolute contraindication to EN, trophic feeds provides a reasonable compromise to achieving early initiation of EN in critically ill patients with recent intestinal surgery, without causing harm. Whilst the evidentiary basis of this practice is weak, at the same time, there is little justification for withholding early EN in the critically ill patient with recent intestinal surgery.

Summary

- Feeding protocols, motility agents and small bowel feedings can improve nutrition delivery to critically ill patients
- Ideally small bowel access can be obtained intraoperatively
- Unless there is an absolute contraindication to EN, trophic feeds are a reasonable compromise to achieving early initiation of EN



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For more information go to www.criticalcarenutrition.com or contact Lauren Murch at murchl@kgh.kari.net.

Thanks for nibbling on our NIBBLE.