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NIBBLE

Nutrition Information Byte

Critical Care Nutrition

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Small Bowel Feeding

While nutritional therapy is a component of standard care for the critically ill, whether enteral feeding tubes should be preferentially placed into the stomach or small intestine remains contentious (see **Table 1**).

Table 1: The advantages/disadvantages of intragastric and small intestinal feeding tubes

	Advantages	Disadvantages
Intragastric feeding tubes	➢ Easy to insert, so once decision made to feed the delivery of nutrient can promptly commence.	➢ Delayed gastric emptying, which predisposes to inadequate nutritional delivery
Small intestinal feeding tubes	➢ Bypasses the area where gastrointestinal motility appears to be maximally disturbed (the stomach), which should 'guarantee' delivery of nutrient. ➢ May reduce ICU-acquired pneumonia, which should shorten requirement for mechanical ventilation, ICU and hospital LOS, and may reduce mortality.	➢ May be more difficult to insert, requiring specific expertise and equipment.

In a recently published paper[1] we performed a systematic review and meta-analysis to determine the effects of small bowel and gastric tube delivery of liquid nutrient on hospital-acquired pneumonia, duration of mechanical ventilation, length of ICU and hospital stay, mortality and nutritional intake in adult critically ill patients.

Results from the Systematic Review and Meta Analysis:

We found 15 randomized trials of small bowel vs. gastric feeding. In all trials except one, unselected patients were enrolled at the start of providing enteral nutrition (in contrast at the point of developing intolerance). When statistically aggregated, small bowel feeding was associated with a reduced risk of ICU-acquired pneumonia when compared to gastric (Relative Risk (RR): small intestine vs. intragastric: 0.75 [0.60-0.93] p = 0.01; test for heterogeneity I^2 = 11%; Figure 1). Administration of nutrient directly into the small intestine did not appear to influence the length of stay (Weighted Mean Difference (WMD): 0.49 days [-1.36-2.33]; p = 0.60; I^2 = 81%), duration of mechanical ventilation (WMD: -0.36 [-2.02, 1.30]; p = 0.67; I^2 = 42%), and mortality (RR: 1.01 [95% CI 0.83-1.24] p = 0.92; I^2 = 0%). Data from 6 studies that reported nutritional intake as mean ± SD could be aggregated. When these data were grouped small bowel feeding compared to gastric feeding was associated with a significantly greater percentage of nutritional intake (WMD 11% of intake/amount prescribed [5, 16]; p=0.0004, I^2=88%).

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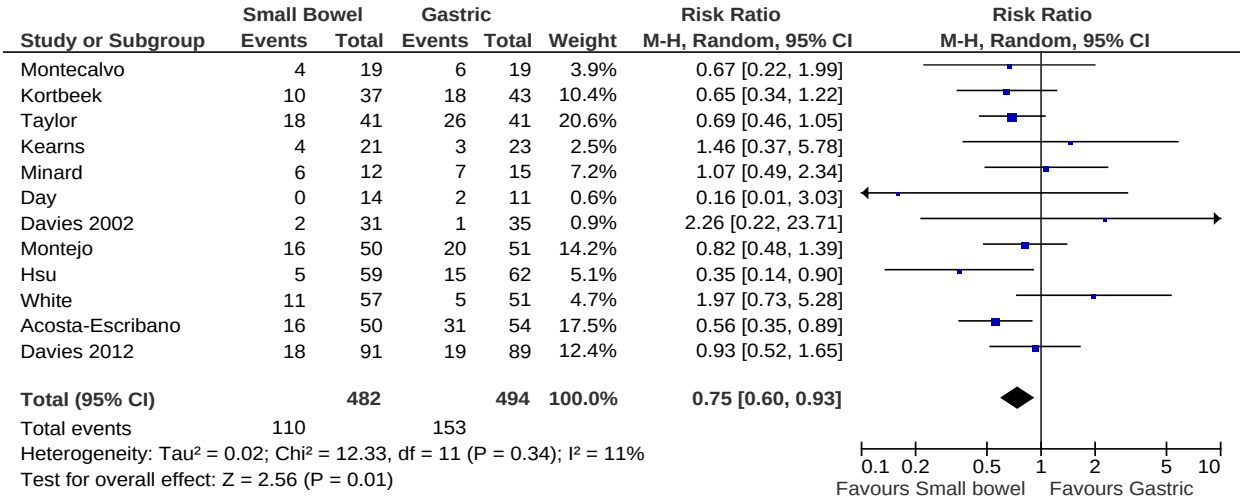
Figure 1: The use of small intestinal feeding tubes reduces the incidence of pneumonia (reproduced with permission from the Clinical Evaluation Research Unit[2])



Is there evidence to support decision making during all clinical situations?

There are no studies of patients with persistent feed-intolerance and/or those at the greatest risk of ICU-acquired pneumonia (e.g. patients with spinal injuries that have to be nursed in a supine position without head elevation). We speculate these patient populations may benefit even more from delivery of nutrient directly into the small intestine, but there is little clinical evidence to support this assertion. The decision to feed in the small bowel is complicated by the technical and logistical challenges in obtaining small bowel access. These challenges vary across sites, depending on local expertise, resources and available technologic solutions.

Small bowel feeding may be associated with a reduction in ICU-acquired pneumonia and increases in nutrient delivery, but days of ventilation, ICU and hospital stay, and mortality were unaffected. Until further data are available decisions as to whether to preferentially feed patients into the small intestine will need to be at an institutional level, incorporating the feasibility, safety, and delays in obtaining access, while identifying patient's most likely to benefits from this route of feeding. As we state in the 2013 Canadian Critical Care Nutrition guidelines[2]:

> "In units where small bowel access is feasible, we recommend the routine use of small bowel feedings. In units where obtaining access involves more logistical difficulties, small bowel feedings should be considered for patients at high risk for intolerance to EN (on inotropes, continuous infusion of sedatives, or paralytic agents, or patients with high nasogastric drainage) or at high risk for regurgitation and aspiration (nursed in supine position). Finally, where obtaining small bowel access is not feasible (no access to fluroscopy or endoscopy and blind techniques not reliable), small bowel feedings should be considered for those select patients that repeatedly demonstrate large gastric residuals and are not tolerating adequate amounts of EN intragastrically."

References

[1] Deane A, Dhaliwal R, Day AG, Ridley EJ, Davies AR, Heyland DK. Comparisons between intragastric and small intestinal delivery of enteral nutrition in the critically ill: a systematic review and meta-analysis. *Critical Care*. 2013;17(3):R125. [Epub ahead of print]

[2] http://criticalcarenutrition.com/index.php?option=com_content&view=category&layout=blog&id=21&Itemid=10. Accessed July 11th, 2013.

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