

post-ligament of Treitz feeding. Tube feeding should not be discontinued for gastric residuals of <300 mL unless there are other signs of gastrointestinal intolerance, such as nausea, vomiting, or abdominal distention. Continuous feeding using pumps is better tolerated intragastrically than bolus feeding and is essential for feeding into the jejunum. For small-bowel feeding, residuals are not assessed, but abdominal pain and distention should be monitored.

**Diarrhea** Enteral feeding often leads to diarrhea, especially if bowel function is compromised by disease or drugs (most often, broad-spectrum antibiotics). Sorbitol used to flavor some medications can also cause diarrhea. Diarrhea may be controlled by the use of a continuous drip, with a fiber-containing formula, or by the addition of an antidiarrheal agent to the formula. However, *Clostridium difficile*, which is a common cause of diarrhea in patients being tube-fed, should be ruled out as the etiology before antidiarrheal agents are used. H<sub>2</sub> blockers may help reduce the net volume of fluid presented to the colon. Diarrhea associated with enteral feeding does not necessarily imply inadequate absorption of nutrients other than water and electrolytes. Amino acids and glucose are particularly well absorbed in the upper small bowel except in the most diseased or shortest bowel. Since luminal nutrients exert trophic effects on the gut mucosa, it is often appropriate to persist with tube feeding despite diarrhea, even when this course necessitates supplemental parenteral fluid support.

Apart from conditions with drastically diminished small-intestinal absorptive function, there are no established indications for short peptide-based or elemental formulas.

## GLOBAL CONSIDERATIONS



In the United States, the only parenteral lipid emulsion available is made with soybean oil, whose constituent fatty acids have been suggested to be immunosuppressive under certain circumstances. In Europe and Japan, a number of other lipid emulsions are available, including those containing fish oil only; mixtures of fish oil, medium-chain triglycerides, and long-chain triglycerides as olive oil and/or soybean oil; mixtures of medium-chain triglycerides and long-chain triglycerides as soybean oil; and long-chain triglyceride mixtures as olive oil and soybean oil, which may be more beneficial in terms of metabolism and hepatic and immune function. Furthermore, a glutamine-containing dipeptide for inclusion in TPN formulas is available in Europe and may be helpful in terms of immune function and resistance to infection, although a recent study using a larger-than-recommended dose was associated with net harm.

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