

Nutrition in Intestinal Failure



Andrew Xia

Advanced Clinical Dietitian
MSc in Nutrition and Dietetics (1st Hons)

Andrew Xia is an Advanced Clinical Dietitian working in Auckland specialised in surgical and community nutrition. Andrew enjoys helping people improve their health and wellbeing with evidence based nutrition knowledge and tailored advice. Food is an important part of everyone's life, Andrew loves traveling and experiencing different cultures through food. He also loves being outdoors and connecting with nature.



Intestinal failure (IF) is defined by the European Society for Clinical Nutrition and Metabolism (ESPEN) as the reduction of gut function below the minimum necessary for the absorption of macronutrients and/or water and electrolytes, such that intravenous supplementation (IVS) is required to maintain health and/or growth (1). Five major conditions may contribute to IF, namely short bowel, intestinal fistula, intestinal dysmotility, mechanical obstruction and extensive small bowel mucosal disease (2). In the event of an enterocutaneous fistula, the primary mechanism of IF is the malabsorption of the ingested food as a result of a reduction or bypass of the absorptive mucosal surface (2).

The main symptom of IF is diarrhoea or high stoma output, which when severe, can lead to dehydration, malnutrition and weight loss. To prevent dehydration and malnutrition, parenteral nutrition (PN) is often used in the management of IF. However, it is not without its own complications, high cost, and decrease in quality of life in the long term (3). Therefore, dietary modifications as part of a multidisciplinary approach together with novel intestinotrophic pharmaceuticals and surgery may be able to stimulate intestinal adaptation and optimise intestinal absorption in order to achieve independence from PN (3).

Food and fluid not only provide nourishment, with appropriate modifications they can also help improve intestinal adaptation and symptom control (3). Early dietary modification is critical for optimal intestinal adaptation. Diet should be tailored to the individual's remaining bowel anatomy.

Timely dietary education and counselling are also crucial to enhance adherence and successful outcomes (3,4). The table below provides specifics regarding diet modifications for IF, which is adapted from Parrish CR, DiBaise JK (4).

General Tips

- Consume 6–8 small meals or snacks per day
- Chew foods well

Protein

- Ensure high protein foods are included at each meal

Carbohydrates

- Generous intake of complex carbohydrates (e.g. pasta, rice, potato, bread)
- Limit simple sugars and sugar alcohols in both foods and fluids

Fat

- Limit fat to < 30% in individuals with a colon
- Include oils with essential fatty acids (e.g. sunflower, soy, walnut)

Oxalate

Limit if the colon is present **Fluids**

- Consider oral rehydration solutions (isotonic)
- All fluids may need to be limited if persistent high output

Salt

- Increase salt intake in individuals without a colon; continue usual intake in ones with a colon

Fibre

- Encourage some soluble fibre (in food) if a colon is present

In recent years with the advancement of technology, chyme reinfusion (CR) has been used as one of the 'distal nutrition' techniques to restore digestive function to the downstream intestine and reduce the need for PN (5). Chyme reinfusion, developed by Dr Etienne Levy in the 1970s, establishes an extracorporeal circulation of the chyme between the collection pouch and the downstream small intestine (5). This corrects IF, restores enterohepatic cycles and stimulates L-cell enterocytes in proportion to the additional function that the downstream intestine can perform (5). Researchers in France, Picot et al, conducted a retrospective study of 306 patients treated with CR from 2000 to 2018 (5). Before CR, 211 (69%) patients had IVS for nutrition and/or hydration. Intravenous supplementation was stopped in 188 (89%) patients, a week after the beginning of CR. Nutritional status improved in regard to weight gain ($+3.5 \pm 8.4\%$). Interestingly, weight gain was more significant in malnourished patients. Although food had to be prepared as puree texture to avoid clogging the tubing, which can be perceived as a technique constraint; eighty-one patients with double enterostomies pureed their food at home. Less than 5% of them asked for CR to be stopped as they enjoyed the ability of choosing the foods they preferred. Thus, CR has shown promising results in improving nutritional status while decreasing dependency on IVS among patients who may have required IVS over periods spanning weeks or months.

References

1. Pironi L, Arends J, Baxter J, Bozzetti F, Pelaez RB, Cuerda C, et al. ESPEN endorsed recommendations. Definition and classification of intestinal failure in adults. Clin Nutr 2015 Apr;34(2):171e80. <http://dx.doi.org/10.1016/j.clnu.2014.08.017>. PubMed PMID: 25311444.
2. Pironi, L. & Arends, Jann & Bozzetti, F.. (2016). Home Artificial Nutrition & Chronic Intestinal Failure Special Interest Group of ESPEN. ESPEN guidelines on chronic intestinal failure in adults. Clin Nutr. 35. 247–307.
3. Parrish, C. R., & DiBaise, J. K. (2017). Managing the Adult Patient With Short Bowel Syndrome. Gastroenterology & hepatology, 13(10), 600–608.
4. Parrish CR, DiBaise JK. Short bowel syndrome in adults—part 2. Nutrition therapy for short bowel syndrome in the adult patient. Practical Gastroenterology. 2014;38(10):40–51.
5. Picot, D., Layec, S., Seynhaeve, E., Dussaulx, L., Trivin, F., & Carsin-Mahe, M. (2020). Chyme Reinfusion in Intestinal Failure Related to Temporary Double Enterostomies and Enteroatmospheric Fistulas. Nutrients, 12(5), 1376. <https://doi.org/10.3390/nu12051376>