

Parenteral Nutrition in Adult Patients with Obesity: Indications and Implementation

Background

Individuals with obesity face unique nutrition challenges, including protein-calorie malnutrition, micronutrient deficiencies, and sarcopenic obesity.

- Malnutrition in patients with obesity remains underdiagnosed, in part due to perceived challenges in applying standard screening and diagnostic criteria to larger body sizes, misconceptions about body fat as a marker of nutrition adequacy, and biases that can hinder objective clinical evaluations.¹
- Lack of nutrition therapy for hospitalized patients with obesity may be detrimental to clinical outcomes (e.g., wound healing, functional status, survival) as patients with obesity have a higher protein turnover and greater rate of catabolism than those without obesity.²
- Many critically ill patients with obesity and those with complications secondary to bariatric surgery may require parenteral nutrition (PN).^{2,5}

This practice tool outlines PN indications, initiation, and follow-up for these patient populations.

Patients with Critical Illness and Obesity

Patients with obesity who are critically ill require a specialized nutrition approach. Malnutrition risk may be underdetected in patients if BMI is included in the screening tool and excess body fat can mask low muscle mass.¹ In 2014, a multicenter cohort study found that initiation of nutrition support was delayed in patients with critical illness and obesity compared with those with critical illness and normal or low weight.⁶

PN Indications: PN is indicated in critically ill patients who are unable to consume adequate oral or enteral nutrition (EN).

Timing: Start PN early when EN is not feasible or sufficient in high-risk or poorly nourished patients. Initiate PN after 7 days in well-nourished, stable adult patients who have been unable to receive >50% of estimated requirements. Initiate PN within 3–5 days in those who are nutritionally at risk and unlikely to achieve desired oral intake or EN.⁷

Nutrient Needs and PN Initiation:

- Energy intake should be guided by indirect calorimetry.⁵
- Suggest a high-protein, hypocaloric feeding be implemented to preserve lean body mass, mobilize adipose stores, and minimize the metabolic complications of overfeeding.⁷
- Use 11–14 kcal/kg actual body weight per day for BMI of 30–50 and 22–25 kcal/kg ideal body weight per day for BMI >50.⁷

- Prescribe at least 1.2 g/kg/d protein in patients with obesity who are critically ill.⁸
- Provide micronutrient supplementation
- Assess for refeeding syndrome—patients with obesity may be at risk despite excess body weight, particularly after prolonged inadequate intake, significant weight loss, or malabsorption

Patients with Bariatric Surgery Complications

- Bariatric surgery is one of the most effective techniques for achieving sustained weight loss but can be associated with surgical complications or malabsorption so significant that it leads to malnutrition. PN may be necessary to help treat surgical complications or malnutrition associated with these procedures.³
- **PN Indications:** Anastomotic leak, intestinal obstruction or stenosis, inability to tolerate EN, peritonitis or abdominal abscess, malabsorption, fistula, hernia, ulceration refractory to treatment, dysmotility, intussusception, prolonged ileus, and chronic intestinal failure.^{3,9,10}
- **Timing:** Timing to begin PN is dependent on the indication, the ability to tolerate other forms of nutrition, and monitoring of nutrition status post-bariatric procedure. In one series, 51 of 54 patients began home PN 6 months after surgery.³ Initiate PN after 7 days for well-nourished, stable adult patients who have been unable to receive significant (50% or more of estimated requirements) oral or enteral nutrients. Initiate PN within 3–5 days in those who are nutritionally at risk and unlikely to achieve desired oral intake or EN.¹¹

Nutrient Needs and PN Initiation:

- Provide 23 kcal/kg actual body weight^{3,4}
- For hypocaloric home PN, consider 13 kcal/kg of actual body weight¹²
- Provide 1.2 g/kg actual body weight⁹
- Monitor for and treat vitamin and trace element deficiencies. Add appropriate supplementation during PN therapy. Micronutrient deficiencies are common following bariatric surgery, particularly in patients with prolonged vomiting, poor oral intake, malabsorption, or surgical complications.
- These patients often go home on home PN for long-term resolution of the bariatric surgery complication.^{3,4,9}

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Case Presentation #1

Critical Care

A 47-year-old man with obesity (BMI 41 kg/m²; actual body weight 131 kg) sustained multi-trauma secondary to a motor vehicle accident, including traumatic brain injury, abdominal trauma requiring intestinal resection, and splenectomy. He was NPO and remained on intestinal decompression for 1 week without nutritional intake. EN was initiated but could not be advanced past 30 mL per hour, and PN was started at 1350 kcal and 100 g of protein, then adjusted to achieve a total intake of 1800 kcal and 150 g protein daily. Multivitamins and trace elements were included along with standard additives. After 21 days in the ICU and two weeks on PN, he was able to be transitioned to full EN.

Case Presentation #2

Bariatric Surgery Complication

A 52-year-old woman with obesity (BMI 44 kg/m²; actual body weight, 133 kg; with a history of hypertension and sleep apnea, underwent an elective Roux-en-Y gastric bypass (RYGB). With a RYGB, the upper portion of the stomach is transected, and a small proximal gastric pouch is created and connected to a proximal jejunum segment (Roux limb), bypassing the rest of the stomach, duodenum, and a portion of the jejunum. RYGB limits food intake and can induce nutrient malabsorption.⁸ Ten days after the procedure, the patient presented with intractable vomiting, weakness, dehydration, and a 16-pound weight loss. Evaluation revealed a small bowel obstruction, and bowel decompression was initiated. With her NPO status and unknown time to oral diet resumption, PN was started via a PICC line at 1350 kcal and 100 g of protein. Multivitamins and trace elements were included along with standard minerals and electrolytes. The obstruction resolved; however, significant malabsorption and inadequate oral intake persisted, and she was discharged home on PN of 1800 kcal and 150 g of protein per day with close outpatient follow-up.

References

1. Schneider ML, Tewksbury C. Addressing bias to facilitate accurate nutrition assessment in obesity. *Nutr Clin Pract*. 2026;41:708-715.
2. Dickerson RN, Patel JJ, McClain CJ. Protein and calorie requirements associated with the presence of obesity. *Nutr Clin Pract*. 2017;32:86S-93S.
3. Mundi MS, Vallumsetta N, Davidson JB, et al. Use of home parenteral nutrition in post-bariatric surgery-related malnutrition. *JPEN J Parenter Enteral Nutr*. 2017;41(7):1119-1124.
4. Van Gossum A, Pironi L, Chambrier C, et al. Home parenteral nutrition (HPN) in patients with post-bariatric surgery complications. *Clin Nutr*. 2017 Oct;36(5):1345-1348.
5. Singer P, Blaser AR, Berger MM ESPEN practical and partially revised guideline: Clinical nutrition in the intensive care unit. *Clin Nutr*. 2023 Sep;42(9):1671-1689.
6. Borel A-L, Schwebel C, Planquette B, et al. Initiation of nutritional support is delayed in critically ill obese patients: a multicenter cohort study. *Am J Clin Nutr*. 2014;100(3):859-866.
7. McClave SA, Taylor BE, Martindale RG, et al. Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.). *JPEN J Parenter Enteral Nutr*. 2016 b;40(2):159-211.
8. Newberry C, Patel JJ, Mundi MS, et al. Obesity and metabolic disorders. In: *ASPEN Adult Nutrition Support Core Curriculum, 4th edition*. Lingtak-Neander Chan, ed. American Society for Parenteral and Enteral Nutrition, 2025.
9. Tewksbury C, Mahoney L, Shover R, et al. Considerations in nutrition support for long-term bariatric surgery care. *Nutr Clin Pract*. 2025 Oct;40(5):1065-1072.
10. Daoud DC, Schwenger KJP, Ghorbani Y, et al. Long-term home parenteral nutrition in chronic intestinal failure following metabolic and bariatric surgery and its clinical outcomes: A descriptive cohort study. *JPEN J Parenter Enteral Nutr*. 2025 Aug;49(6):773-782.
11. Worthington P, Balint J, Bechtold M, et al. When is parenteral nutrition appropriate? *JPEN J Parenter Enteral Nutr*. 2017 Mar;41(3):324-377.
12. Hamilton C, Dasari V, Shatnawei a, et al. Hypocaloric home parenteral nutrition and nutrition parameters in patients following bariatric surgery. *Nutr Clin Pract*. 2011;26(5):577-582.

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Key Takeaways

- Patients with obesity and other morbidities should be evaluated for malnutrition risk
- If risk is present, begin nutrition support and use PN if EN is not indicated or adequate
- Consider high-protein, hypocaloric regimen to preserve lean body mass, mobilize adipose stores, and minimize the metabolic complications of overfeeding
- Provide 1.2 g/kg actual body weight
- Provide micronutrient supplementation