Nutrition Intervention for a Small Bowel Obstruction and Intractable Nausea/Vomiting in the Critical Care Setting with Severe Malnutrition: A Case Report

Department of Nutritional Science
Caroline Cheney, BS Ashley Mullins, MS, RD, LD, CNSC

Background

Small bowel obstruction (SBO) is a partial or complete blockage of the small intestine preventing normal passage of gastrointestinal (GI) contents.[1] Common causes of SBO include adhesions, hernias, tumors/malignancies, and inflammatory conditions.[2] SBO leads to abdominal pain, distension, nausea, vomiting, malaise, dehydration, and lack of appetite.[1,3] Persistent vomiting contributes to significant fluid, electrolyte, and nutrient loss, and catabolic stress. In the critical care setting, these effects have a greater significance in patients with underlying severe malnutrition. Reduced intake, nutrient malabsorption, and ongoing GI losses exacerbate energy and protein deficits leading to impaired immune function, delayed wound healing, increased morbidity and risk of excess complications, and increased length of stay.[1−3] Early identification of nutrition risk and timely intervention are vital to mitigate complications including bowel ischemia, perforation, sepsis, and nutrient depletion.[1,3] Evidence-based practice suggests parenteral nutrition (PN) as means of nutrition support when GI tract function is compromised or enteral nutrition (EN) is not tolerated or feasible due to excessive vomiting or required bowel rest.[4,5] Cautious initiation and advancement of nutrition support and careful monitoring of electrolytes are critical to reduce the risk of refeeding syndrome in SBO patients with delayed nutrition support and underlying malnutrition.[6,7] As the obstruction resolves, gradual reintroduction of oral intake is recommended through low-fiber and high-energy foods to support GI tolerance and nutritional status improvement.

Nutritional Considerations

Figure 1: Evidence-Based Nutrition Support Guidelines

Consideration	Recommendation
Feeding Route	Initiate EN when GI tract is functional and accessible. Use PN when EN is contraindicated (in cases such as complete obstruction, severe ileus, ischemia, etc.)[4,5]
Timing of Nutrition Support	In well-nourished patients, initiate nutrition support if inadequate intake persists for >5-7 days. In patients at high nutrition risk or have underlying malnutrition, initiate earlier within 3-5 days.[4,5]
Energy Needs	Provide 25-30 kcal/kg/day for most patients.[4,8,9] Increase up to 30-40 kcal/kg/day in hypermetabolic or malnourished states.[5,10] Adjust based on clinical condition and indirect calorimetry if available.
Protein Needs	Target 1.2-2.0 g/kg/day depending on catabolic state. May require higher needs in catabolic states to preserve lean body mass and support healing.[4,8,9]
Fluid and Electrolyte Management	Monitor and replete fluid status and electrolytes (Na, K, Mg, Phos) due to GI losses, third spacing, and risk of imbalances.[6,10] Correct any and all abnormalities prior to and during nutrition support.
Refeeding Risk	Identify high-risk patients (prolonged NPO status, malnutrition, etc.). Monitor phosphorus, potassium, and magnesium, and initiate nutrition cautiously with appropriate electrolyte repletion.[6,7]
Route Advancement	Transition from PN to EN or oral diet as soon as GI function returns to reduce infection risk, further malnutrition, and support gut integrity and function.[4,5]

Case Report

Case Summary

79-year-old female with past medical history significant for dysphagia, hypertension, and post-polio syndrome with associated mobility limitations presented with persistent nausea, vomiting, and abdominal distention and was diagnosed with a small obstruction. Prior to admission, the patient reported chronic poor oral intake, reduced appetite, and difficulty chewing and swallowing. On hospital day 2, patient failed nasogastric tube (NGT) placement and on day 3, underwent exploratory laparotomy, small bowel resection, and repair of strangulating hernia requiring postoperative ICU admission due to difficulty extubating the patient. NGT and gastrostomy were also placed under anesthesia to suction and drain to help resolve the obstruction.

Assessment

Anthropometrics: Height: 167.6 cm (66"). Weight: Admit Weight: 36.7 kg (81 lb), BMI: 13.1 kg/m2 (underweight), IBW: 130 lb (59 kg), %IBW: 62% (<70% indicates severe deficit), UBW: 110 lb (per patient report), %UBW: 73% (<74% indicates severe deficit)

Nutrition Focused Physical Exam (NFPE):

Findings: Moderate muscle loss (Temporalis, Interosseous, and Quadriceps), Severe muscle loss (Deltoid and Trapezius), Mild fat loss (Orbital), Severe fat loss (Triceps), 35% weight loss in 7 months, Meeting <75% of needs for at least 1 month --> Meets criteria for **Chronic Severe Protein-Calorie Malnutrition (PCM)**

Estimated Nutrition Needs

Calories: 1284-1468 kcal/day; (35-40 kcal/kg due to severe PCM)

Protein needs: 55-73 gm/day; (1.5-2 gm/kg due to severe PCM)

Nutrition Diagnosis

Inadequate protein-energy intake related to altered GI function as evidenced by meeting <85% of estimated needs, inability to initiate nutrition support.

Goals of Nutrition Therapy:

- Prevent further weight loss and lean body mass depletion
- Initiate/advance nutrition support to meet estimated needs
- Correct and maintain electrolyte balance
- Minimize risk of refeeding syndrome
- Transition to EN or oral intake as GI function allows

Figure 2: TPN Goal and Initiation Values

Component	Initiated At	Goal
Dextrose	100 gm (47% of goal)	215 gm
Amino Acids	70 gm (100% of goal)	70 gm
Lipids	40 gm (100% of goal)	40 gm
Electrolytes	20 KCl, 30 Kphos, 8 Mg sulfate, 0 mg Ca gluconate, 10 mL multivitamin, 1 mL trace elements, 100 mg thiamine, 1 mg folic acid	Reassess as needed
Calories Provided and Met:	1020 kcal, 84%	1411 kcal, 100%

Nutrition Interventions

Intervention	Barriers Encountered	Clinical Evidence-Based Response
Initiation of PN Rationale: Indicated due to severe malnutrition and non-functional GI tract	- GI intolerance - Inability to use EN or oral diet	PN selected as nutrition support route
Clinimix as Interim Nutrition Support Rationale: Provided nutrition to meet 23% of calorie needs and 100% of protein needs until TPN was feasible Note: Patient was receiving D5 to provide minimal caloric support prior to PN to prevent further malnutrition	- Positive blood cultures indicating infection delaying initiation of nutrition support	Used as a temporary strategy to prevent further malnutrition
Advancement to TPN Rationale: Provided adequate calories and protein to meet needs	- Infection presence - Metabolic instability	Initiated after consulting with MD
Electrolyte Monitoring and Repletion Rationale: High risk for refeeding syndrome due to prolonged NPO status, chronic severe malnutrition, and ongoing GI losses	- Electrolyte imbalances (↓K, ↓ Phos,↓ Mg)	Frequent labs taken and repletion of electrolytes initiated
Multidisciplinary Coordination Rationale: Ensured safe nutrition advancement and alignment with overall care	- Dysphagia - Evolving goals of care	Adjusted interventions based on overall plan of care and clinical status Address long-term nutrition concerns such as dysphagia and what post-discharge care patient may require

Discussion & Application

This case highlights the complex challenges of implementing evidence-based nutrition support in patients with a SBO and underlying severe malnutrition. In this case, the patient's clinical course was complicated by several barriers. Persistent ileus and GI dysfunction prevented the use of EN and advancement to a PO diet, indicating the necessity of PN. However, positive blood cultures delaying PN initiation despite the patient's severe PCM. In addition, intractable nausea and vomiting, prolonged NPO status, metabolic instability, and electrolyte imbalances further prolonged delayed nutrition support and complicated the patient's plan of care. These key factors highlight the difficulty of balancing evidence-based recommendations for nutrition care with real-life clinical constraints. This case also emphasizes the importance of early malnutrition identification, proactive planning and advocating for PN in high-risk risk patients, and close monitoring for refeeding syndrome to minimize excess strain on the patient. In practice, dietitians play a critical role in advocating for timely interventions and adapting nutrition plans based on the plan of care reinforcing the idea of patient-centered collaborative care. Overall, this case demonstrates that while standards provide a strong framework for care, nutrition interventions must remain individualized, especially in cases with multiple complicating factors.

Conclusion

SBO in the presence of underlying severe malnutrition creates significant barriers for timely nutrition support and requires careful adaptation of evidenced-based guidelines. This case emphasizes the necessity of early identification of nutrition risk, nutrition assessment, interdisciplinary coordination, and advocacy for nutrition intervention when GI function is compromised. Nutrition plays a critical role during and after an obstruction resolves and early recognition of patients at high nutrition risk is essential to initiate timely nutrition intervention and prevent further clinical deterioration. This case highlights the importance of interdisciplinary collaboration and advocacy from dietitians to ensure nutrition support is initiated and advanced appropriately despite underlying and coexisting barriers.

References

1. Schick MA, Kashyap S, Collier SA, et al. Small bowel obstruction. *StatPearls*. Accessed November 16, 2025. https://www.ncbi.nlm.nih.gov/books/NBK448079/
2. Rami Reddy SR, Cappell MS. A systematic review of the clinical presentation, diagnosis, and treatment of small bowel obstruction. *Curr Gastroenterol Rep*. 2017;19(6):28. doi:10.1007/s11894-017-0566-9
3. Cleveland Clinic. Bowel obstruction. *Cleveland Clinic Health Library*. https://my.clevelandclinic.org/health/diseases/bowel-obstruction
4. Bhutiani N, Benns MV, Pappas S, Palmer LB, Miller KR. Surgical alteration of the gastrointestinal tract. *In: Mueller CM, ed. The A.S.P.E.N. Adult Nutrition Support Core Curriculum. 3rd ed. Silver Spring, MD: American Society for Parenteral and Enteral Nutrition*; 2017: 1090-1116
5. Singer P, Blaser AR, Berger MM, et al. ESPEN guideline on clinical nutrition in the intensive care unit. *Clin Nutr*. 2019;38(1):48–79. doi:10.1016/j.clnu.2018.08.037.
6. Catena F, Di Saverio S, Kelly MD, et al. Management of small bowel obstruction in adults. *UpToDate*. Waltham, MA: Wolters Kluwer; 2025. Available from: https://www.uptodate.com/contents/management-of-small-bowel-obstruction-in-adults
7. Limketkai BN, Hurt RT, Palmer LB. Short bowel syndrome. *In: Mueller CM, ed. The A.S.P.E.N. Adult Nutrition Support Core Curriculum. 3rd ed. Silver Spring, MD: American Society for Parenteral and Enteral Nutrition*; 2017:863-884
8. Simmons SF. Nutrition support for the older adults. *In: Mueller CM, ed. The A.S.P.E.N. Adult Nutrition Support Core Curriculum. 3rd ed. Silver Spring, MD: American Society for Parenteral and Enteral Nutrition*; 2017:1059-1089
9. Colaizzo-Anas T. Nutrient intake, digestion, absorption, and excretion. *In: Mueller CM, ed. The A.S.P.E.N. Adult Nutrition Support Core Curriculum. 3rd ed. Silver Spring, MD: American Society for Parenteral and Enteral Nutrition*; 2017:30-63
10. McClave SA, Martindale RG, Vanek VW, et al. Nutrition support in critically ill adult patients: parenteral nutrition. *UpToDate*. Waltham, MA: Wolters Kluwer; 2025. Available from: https://www.uptodate.com/contents/nutrition-support-in-critically-ill-adult-patients-parenteral-nutrition