

October 7, 2024

2024 Parenteral Nutrition Product Shortage Recommendations: Intravenous Dextrose

ASPEN has developed parenteral nutrition (PN) shortage recommendations to assist its members and other clinicians in coping with PN shortages for their patients. These intravenous dextrose product shortage recommendations were developed by the ASPEN Parenteral Nutrition Committee and approved by the ASPEN Board of Directors.

Document Contents:

- [General Recommendations for Intravenous Dextrose Shortage Management](#)
- [Specific Considerations for Intravenous Dextrose Shortage Management](#)
- [ASPEN Resources](#)
- [References](#)

Important Notes:

- These recommendations do not constitute medical or professional advice and should not be taken as such. To the extent the information published herein may be used to assist in the care of patients, this is the result of the sole professional judgment of the attending health professional whose judgment is the primary component of quality medical care. The information presented herein is not a substitute for the exercise of such judgment by the health professional.
- No single strategy will work for all organizations, and all are less than ideal for providing safe and optimal patient care. Institutions must carefully consider options and weigh the risks and benefits prior to implementation.

Questions regarding these recommendations should be directed to clinicalpractice@nutritioncare.org.

General Recommendations for Intravenous Dextrose Shortage Management

During an intravenous dextrose shortage, we recommend consideration of the following general measures:

1. **For all patients**, routinely assess and reassess patient-specific indication(s) for nutrition support and requirement for PN; provide nutrition via the oral or enteral route when possible and clinically appropriate.^{1,2}
2. **Communicate with all key stakeholders** (e.g., pharmacy department, nursing department, central supply). Communication is essential to understanding the current stock, procurement issues, and bedside practice. Establish a process to maintain clear communication across departments.
3. **Do not stockpile**. Purchase only as much supply as needed in the interest of fair allocation to all patients.
4. **Ensure understanding of differences among intravenous dextrose products**. During prolonged shortages of intravenous dextrose products, the FDA may approve the temporary importation of

alternative products from outside the United States. These products may have different concentrations, packaging, and labeling than United States products. The Dear Healthcare Professional Letter accompanying imported products should be read carefully. Members of the healthcare team should be educated on any differences between imported products and products approved for use in the United States.

5. Maintain or incorporate the following sterile compounding practices:

- Compound PN in a single, central location (either in a centralized pharmacy or as outsourced preparation) to decrease inventory waste. Consider a supply outreach to other facilities in your geographic location.
- Facilities must continue to observe and comply with the product labeling (e.g., package insert), USP General Chapter <797> Pharmaceutical Compounding-Sterile Preparations and associated USP chapters, and state Boards of Pharmacy and federal rules and regulations.³

6. Ensure PN compatibility and stability with all changes during times of PN component shortages.

7. Develop an organizational strategy. Include PN component and product shortages in the healthcare organization's strategies and procedures for managing medication shortages. These procedures should include processes to:

- identify and monitor patients who are receiving a PN regimen that has been modified due to a product shortage,
- notify clinicians when a shortage of a PN component or product occurs,
- notify clinicians when PN formulations are adjusted due to shortages of PN components and products,
- notify patients receiving long-term (e.g., more than 1 month) PN therapy and their caregivers when their PN formulation has been adjusted for shortages of PN components and products,
- notify clinicians when a PN component shortage has resolved, and
- **resume normal dosing practices when a PN component shortage has resolved.**

8. Report shortages and errors.

- Report severe drug product shortage information to the [FDA Center for Drug Evaluation and Research \(CDER\) Drug Shortage Program](#).
- Report any patient adverse events or medication hazards related to shortages to the [ISMP Medication Errors Reporting Program \(MERP\)](#).

Specific Considerations for Intravenous Dextrose Shortage Management

- 1. Please note that withholding dextrose from PN places the patient at risk for complications, and there is currently no evidence for the compatibility or stability of dextrose-free PN admixtures.⁴**
2. Assess all patients for appropriate indications for PN prior to initiation; frequently reassess patients for ongoing appropriate indications for continuation of PN.¹
3. Conserve supply for the following populations:
 - Neonatal and pediatric patients
 - Patients with disorders of dysglycemia at risk of developing hypoglycemia

- Patients with severe malnutrition who are unable to tolerate enteral or oral intake
 - Patients requiring long-term PN who rely solely on PN (i.e., unable to tolerate enteral or oral intake)
4. Prioritize higher concentrations of dextrose for PN compounding.
 5. Strongly consider the use of multi-chamber bag PN products, if clinically feasible.⁵
 6. Avoid overfeeding. Consider all sources of caloric intake when determining dextrose needs [including oral, enteral, medication (e.g., propofol), and intravenous fluid sources].
 7. Reduce intravenous dextrose content in PN formulations in patients who can tolerate a reduction in dextrose dose. Adjust the content of other macronutrient components (e.g., amino acids, lipid injectable emulsions [ILE]) to account for the decrease in kcal from reducing the dextrose dose as appropriate. Refer to [ASPEN's Recommendations for Appropriate Dosing for Parenteral Nutrition](#) and manufacturer prescribing inserts for appropriate ranges of macronutrient doses and maximum infusion rates. For more guidance on ILE dosing, refer to ASPEN's adult and pediatric consensus recommendations.^{6,7}
 8. Collaborate with the multidisciplinary care team on the appropriate frequency of laboratory monitoring and necessary changes to the medication regimen (e.g., insulin) with changes in the PN admixture composition to ensure patient safety. Patients with a reduction in dextrose may be at greater risk for hypoglycemia and may require more frequent laboratory monitoring until stabilization is achieved.
 9. Consider alternate concentrations of intravenous dextrose products based on availability for PN compounding. Please note the use of any alternative products will require modification to electronic health record systems, automated compounding devices (ACDs), and ACD-supporting applications to reflect current product availability and to prevent the inclusion of incorrect or unavailable ingredients in PN orders.⁸
 10. Consider the universal ingredient on the ACD; if it is dextrose, consider changing to sterile water, if available.

ASPEN Resources

PN/EN Indications:

- [When Is Parenteral Nutrition Appropriate?](#)
- [When Is Enteral Nutrition Indicated?](#)

PN Dosing and Safe Practices:

- [Appropriate Dosing for Parenteral Nutrition: ASPEN Recommendations](#)
- [ASPEN Clinical Guidelines: Parenteral Nutrition Ordering, Order Review, Compounding, Labeling, and Dispensing](#)
- [ASPEN Parenteral Nutrition Safety Consensus Recommendations](#)

PN Compatibility and Stability:

- [Parenteral Nutrition Compatibility and Stability: A Comprehensive Review](#)
- [Parenteral Nutrition Compatibility and Stability: Practical Considerations](#)

Multi-Chamber Bag Parenteral Nutrition (MCB-PN):

- [Multi-Chamber Bag Parenteral Nutrition: Indications, Product Availability, and Patient Safety](#)

References

1. Worthington P, Balint J, Bechtold M, et al. When Is Parenteral Nutrition Appropriate? *JPEN J Parenter Enteral Nutr.* 2017;41(3):324-377.
2. Bechtold ML, Brown PM, Escuro A, et al. When is enteral nutrition indicated? *JPEN J Parenter Enteral Nutr.* 2022;46(7):1470-1496
3. USP General Chapter <797> Pharmaceutical Compounding- Sterile Preparations. United States Pharmacopeial Convention. 2022.
4. Ling P, McCowen KC. *Carbohydrates*. In: Mueller CM, ed. *The ASPEN Adult Nutrition Support Core Curriculum*. 2nd ed. Silver Spring, MD: American Society for Parenteral and Enteral Nutrition;2012:36-50.
5. *Multi-Chamber Bag Parenteral Nutrition: Indications, Product Availability, and Patient Safety Practice Tool*. 2024. American Society for Parenteral and Enteral Nutrition. Available at: https://www.nutritioncare.org/uploadedFiles/Documents/Guidelines_and_Clinical_Resources/PN_Resources/MCB-PN-Practice-Tool.pdf. Accessed October 8, 2024.
6. Mirtallo JM, Ayers P, Boullata J, et al. ASPEN Lipid Injectable Emulsion Safety Recommendations, Part 1: Background and Adult Considerations. *Nutr Clin Pract.* 2020;35(5):769-782.
7. Cober, MP, Gura KM, Mirtallo JM, et al. ASPEN lipid injectable emulsion safety recommendations part 2: Neonate and pediatric considerations. *Nutr Clin Pract.* 2021;36(6):1106-1125.
8. Ayers P, Foster J, Kanorwala A, et al. Electronic Health Record and Parenteral Functionality: A Gap Analysis. *Nutr Clin Pract.* 2021;36(2):433-439.

About ASPEN

The American Society for Parenteral and Enteral Nutrition (ASPEN) is dedicated to improving patient care by advancing the science and practice of nutrition support therapy and metabolism. Founded in 1976, ASPEN is an interdisciplinary organization whose members are involved in the provision of clinical nutrition therapies, including parenteral and enteral nutrition. With members from around the world, ASPEN is a community of dietitians, nurses, nurse practitioners, pharmacists, physicians, PAs, researchers, scientists, and students from every facet of nutrition support clinical practice, research, and education. For more information about ASPEN, please visit www.nutritioncare.org.