

Getting your Patient home on TPN

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Disclosure

No commercial relationships to Disclose

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Objectives

The Learner will be able to:

- Discuss social, financial, and clinical challenges to home TPN in today's healthcare system
- Identify essential factors for a safe discharge home on TPN.
- Discuss what knowledge the patient/caregiver must possess for a successful transition from the hospital to the home.



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TPN in Virginia

- No National Data registry
- In the United States There are approximately 40,000 people currently at home on TPN
- No specific state level data
- Roughly 800-900 patients at home with TPN in Virginia
- Estimated 90 pediatric patients at home

Ayers P, Boullata JI, Canada TW, et al. Parenteral nutrition practice in the United States: A cross-sectional survey with gap analysis. *JPEN J Parenter Enter Nutr.* 2026;50(5):701-716. doi:10.1002/jpen.70087

Centers for Medicare & Medicaid Services. DMEPOS Utilization and Payment Public Use File. Baltimore, MD: CMS; 2024. Accessed July 12, 2026. <https://data.cms.gov>



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History of TPN : Life Saving Therapy

- The first hospital based TPN 1968 Dr Stanley Dudrick and Dr Jonathan Rhoads out of the University of Pennsylvania
- First Home TPN in the late 1970s
- First pediatric TPN in the 1980s
- Advances Attributed to improved Central catheters, catheter materials, improved sterile technique, improved formulations for lipids, advances in home infusion equipment (pole mounted pumps vs ambulatory pumps)

Dudrick S.J. Growth and development of total parenteral nutrition. *JPEN J Parenter Enteral Nutr.* 2003;27(4):291-299.



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Current Dynamics Impacting Home TPN



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Environmental and Social Issues:

DRUG SHORTAGES

- A recent multi-center analysis found **15 different PN drugs on shortage over a 24-month period**, and at one point **24 fluids/electrolytes in shortage — 8 directly tied to PN —** forcing repeated formula changes and raising medication-error risk

FLUID SHORTAGES

- **Hurricane Helene flooded Baxter's North Cove, NC plant on Sept. 29, 2024 —** the site made roughly **60% of the nation's IV/PN solutions** and peritoneal dialysis fluids, halting production.

American Society of Health-System Pharmacists. Drug Shortages Statistics: National Drug Shortages, January 2001 to March 2026. Bethesda, MD: ASHP; 2026. Accessed July 12, 2026.
Mee P, Shi J, Bartley S. Navigating Rising Risks in Healthcare Supply Chains. Oliver Wyman; April 2025. Accessed July 12, 2026. <https://www.oliverwyman.com>



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Drug shortages

- The **American Society of Health-System Pharmacists (ASHP)** reported **227 active national drug shortages** in Q2 2026, the third consecutive quarterly increase after a 2025 low
- The **USP Annual Drug Shortages Report** found that **71% of all shortages** are in sterile injectables, the largest dosage form category

IntuitionLabs. Drug shortages in the United States 2026: full report. IntuitionLabs.ai. Published July 31, 2026. Accessed August 11, 2026. <https://intuitionlabs.ai/articles/drug-shortages-united-states-2026>
United States Pharmacopeia. USP annual drug shortages report reveals rising discontinuations and supply chain risks. USP.org. Published June 9, 2026. Accessed August 11, 2026. <https://www.usp.org/news/usp-2026-annual-drug-shortages-report-rising-discontinuations-supply-chain-risk>



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Hurricane Helene Causes Major Nationwide IV Fluid Shortage: Hospitals Facing Crisis

[Photographer/Author or Institution Name], Fluid Shortage [photograph], [Institution/Hospital Name], [Year], Accessed August 11, 2026.
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 Powers, C. Stop: fluid shortage [photograph], KDZK.com; Published October 28, 2024. Accessed August 11, 2026.

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Environmental/ Social Issues

- Supply Chain Problems
 - Shortages in alcohol wipes, tubing, saline syringes
 - *Rationed deliveries, substituted equipment, tight inventory controls*
- Nursing Shortages
 - Virginia is short roughly 17,000 nurses
 - Home Care is one of areas with the greatest need

merican2026. Society of Health-System Pharmacists. Drug Shortages Statistics: National Drug Shortages, January 2001 to March 2026. Bethesda, MD: ASHP; 2026. Accessed

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Financial Factors

- Medicare Guidelines- preapproval process
- In 2021, the Centers for Medicare and Medicaid Services (CMS) updated the local coverage determination (LCD) for home parenteral nutrition, allowing for more flexibility in qualifying for coverage. This change aimed to reduce the burden of outdated criteria
- Most commercial payers follow less stringent criteria
- Denials typically from documentation gaps

Noridian Healthcare Solutions. Local Coverage Determination (LCD): Parenteral Nutrition (L33364). Centers for Medicare & Medicaid Services; 2024. Accessed July 12, 2026. <https://www.cms.gov/medicare-coverage->



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Individual Patient Considerations

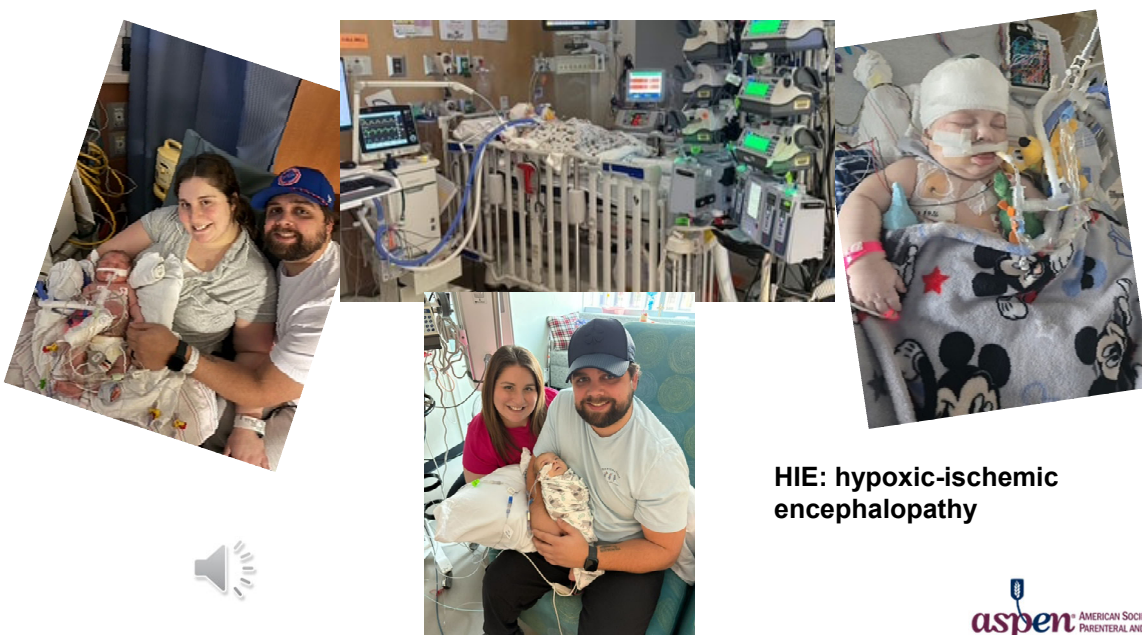


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HIE: hypoxic-ischemic encephalopathy

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Social Determinates

- caregiver availability
- health literacy
- socioeconomic stability
- insurance coverage
- geographic access to specialized care

Winkler MF, Smith CE. Clinical, social, and economic impacts of home parenteral nutrition dependence. *J Parenter Enteral Nutr.* 2022;37(6):1225-1234. doi:10.1002/NCP.10861014;38(1 Suppl):32S-37S.

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Patient Has to ask Themselves

- Am I prepared for the commitment
- Do I fully understand what is involved
- Time factor (a minimum of 2 times per day for the TPN)
- Caregivers working outside of the home
- Other children in the home
- Physically able (stamina, strength)



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Quality of Life on Home TPN

- Focus is often on medical complications
- Psychosocial impact: anxiety, depression, poor sleep
 - Food is central to social life
 - Caregiver burden and isolation
 - Frequent hospitalizations
 - Financial strain; travel and vacations
 - Keep support age appropriate

Jones D, Lal S, French C, Sowerbutts AM, Gittins M, Gabe S, et al. Investigating the relationship between home parenteral support and needs-based quality of life in patients with chronic intestinal failure: a national multi-centre longitudinal cohort study. *Nutrients*. 2023;15(3):622. doi:10.3390/nu15030622



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Environmental Factors

- Where do they live
- Do they have access to care
 - Emergency room
 - Provider
- Refrigeration
 - Room to store 7 large TPN bags
- Electricity
- Phone
- Transportation

Adams SC, Dobrescu C, Hamilton C, et al. Safe care transitions for patients receiving parenteral nutrition. *Nutr Clin Pract*. 2022;37(6):1225-1234. doi:10.1002/NCP.10861
 Worthington P, Balint J, Bechtold M, et al. When is parenteral nutrition appropriate? *JPEN J Parenter Enteral Nutr*. 2017;41(3):324-377. doi:10.1177/0148607117695251



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Clinical Determinates

- Medically Stable
 - Drain/ostomy output
 - Requirements in the home (suction not widely available)
 - Difficult/complicated wound care
 - Appropriate central line
- Labs
 - Must be stable
 - Only able to make 1-2 changes per week
- Able to provide everything needed in home TPN
 - chemistry

American Society for Parenteral and Enteral Nutrition. ASPEN parenteral nutrition care pathway. [nutritioncare.org](https://nutritioncare.org/clinical-resources/parenteral-nutrition/parenteral-nutrition-care-pathway). Accessed August 11, 2026. <https://nutritioncare.org/clinical-resources/parenteral-nutrition/parenteral-nutrition-care-pathway>
 Adams SC, Dobrescu C, Hamilton C, et al. Safe care transitions for patients receiving parenteral nutrition. *Nutr Clin Pract*. 2022;37(6):1225-1234. doi:10.1002/NCP.10861



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The Team

- Ordering/Following Physician (difficult in smaller community hospitals)
- Nutrition Support Team (MD practice vs Hospital Based)
- Home health Support
- Home Infusion Pharmacy
 - Pharmacists and pharmacy Techs for actual TPN and related Supplies
 - Dietitians/Pharmacist to monitor labs and provide guidance to the ordering physician
 - Liaison for inpatient assessment/teaching
 - Nursing support 24/7 on-call support

Adams SC, Dobrescu C, Hamilton C, et al. Safe care transitions for patients receiving parenteral nutrition. *Nutr Clin Pract*. 2022;37(6):1225-1234. doi:10.1002/NCP.10861
 American Society for Parenteral and Enteral Nutrition. ASPEN parenteral nutrition care pathway. nutritioncare.org. Accessed August 11, 2026. <https://nutritioncare.org/clinical-resources/enteral-nutrition/aspn-parenteral-nutrition-care-pathway>



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Education

- Historically the Home Health companies taught patient and caregiver
- More Being done prior to discharge
- No standard “pathway” for education
- Rely much more heavily on patient and caregiver to become independent quickly



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What do they need to Know?

- What is TPN and why do they need it
- Aseptic and sterile technique
- Central line care and infection prevention
- Recognizing complications
- Management of the actual TPN:
 - Storage and supplies
 - Additives
 - Spiking and Priming tubing
 - Operating home infusion pump
 - Troubleshooting alarms
 - Flushing catheter (some may use antibiotic or ethanol locks)



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Equipment

- Ambulatory pump
 - Battery operated
 - Can be plugged in and charged
- Needles, syringes, alcohol pads, saline, heparin syringes, tubing, batteries, additives
 - Team approach to managing inventory
 - Nurse in home can assist and this also assists with identifying problems
 - *Too many tpn bags left in the refrigerator, not requesting additional alcohol wipes.*
 - *Going through supplies too quickly*
- TPN is portable
 - *No air in line*
 - *IV pole/backpack*



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Case Study #1

- 8-year-old with metastatic cancer. Family is from the Philippines and speak mandarin. Mom and Dad were employed full time. Mom stopped working so she could stay with the child full time. Developed a widespread fungal infection requiring amphotericin. Currently unable to take anything by mouth due to obstructions. Patient referred for home TPN
- Clinical Factors:
 - Daily electrolyte changes due to amphotericin
 - ostomy with high output
 - Fracture of hip and leg requiring daily physical therapy
- Following MD
 - Had too many teams, Had to really work to identify who would be responsible for what
 - GI team to manage
 - Specialty social worker for pediatric oncology to follow inpatient and outpatient
- Social/Environment
 - Language barrier
 - Cultural differences. Used Chinese medicine
 - ? Home environment

Is He appropriate for home TPN?

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Case Study #2

60-year-old male. Long history of spina bifida, congenital paraplegia, ileostomy due to history of imperforate anus. Required multiple surgeries during hospitalization to address intraabdominal infection, adhesions, fistulas, and obstructions.

- His Team:
 - Medical doctor willing to follow TPN in the home
 - Home health identified
 - Social Considerations
 - Lives alone
 - Unwilling to ask neighbors, friends for assistance
 - Girlfriend lives out of the area and not available to assist
 - Clinical
 - High output ostomy
 - Complicated wound care
 - Continues to require frequent fluid and electrolyte changes
 - Environment
 - *No one to bring TPN and related supplies into the home*
 - *Deliveries*
 - *Only ramp in garage*
- DO WE TAKE HIM?



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Case #3

- 50-year-old woman with metastatic ovarian cancer. Status post surgery, chemo and radiation. Unable to obtain nutrition enterally. Referral made for home TPN
- Team
 - Surgeon agreed to follow outpatient
 - Home health identified
- Support
 - Husband visited daily and involved in her care
 - Neighbors and other children could assist prn
- Medically
 - No other medical treatments or interventions
 - Stable on TPN
- Environment
 - Meets initial requirements (refrigeration, electricity etc)
 - DO WE TAKE HER?



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Case Study #4

Infant born at 33 weeks via emergency C-section. Complicated post natal course hypoxic-ischemic encephalopathy, multiorgan dysfunction. Developed ischemic bowel resulting in multiple surgeries, ostomy, and necessitated TPN.

- Team
 - Surgeon and GI agreed to follow with GI being primary
 - No home health care (no peds in the area)
- Social:
 - Mother and father actively involved in care
 - No other support system. Just moved here from out of state
 - Dad working. Mom lost her job
- Environment
 - Clean home, meets needs for home therapy
- Medically Appropriate
- Electrolytes stable, ostomy output stable,
- Administering medications (Tylenol, seizure meds)
- Vomiting



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Learning Assessment Question 1

All the following are required for Home TPN except

- A. Electricity
- B. Working telephone service
- C. At least One teachable caregiver
- D. Home Health Services
- E. All The Above

Answer: E



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Learning Assessment Question #2

You receive a referral for Mr Jones to be discharged on home TPN. What clinical parameters must be met?

- A. No other medical needs outside of the TPN
- B. Relevant lab studies are stable and require minimal adjustment
- C. Vital signs are stable and no on-going acute processes
- D. B and C

Answer: D



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Learning Assessment Question # 3

All of the following are social determinates for successful transition home

- A. Stable home environment
- B. Capacity for self and or caregiver to follow complex instructions
- C. Financial Resources and adequate insurance coverage
- D. Access to healthcare (emergency room, home health, providers)
- E. All of the Above

Answer: E



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Questions?



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