PRACTICE TOOL

Improving Patient Adherence to Home Parenteral Nutrition: Use of Pump Technology

Home parenteral nutrition (HPN) is often the sole source of nutrition for approximately 32,000 individuals annually in the US, requiring the full prescription to be delivered to prevent or treat malnutrition.[1] The concept of "adherence" involves a positive therapeutic interaction between providers and patients that results in an agreed-upon treatment plan. Adherence is generally defined as taking ~80% of the prescribed therapy or medication.[2]

This practice tool will review the safety concerns associated with patient nonadherence and strategies to improve adherence, including the use of near real-time infusion pump data.

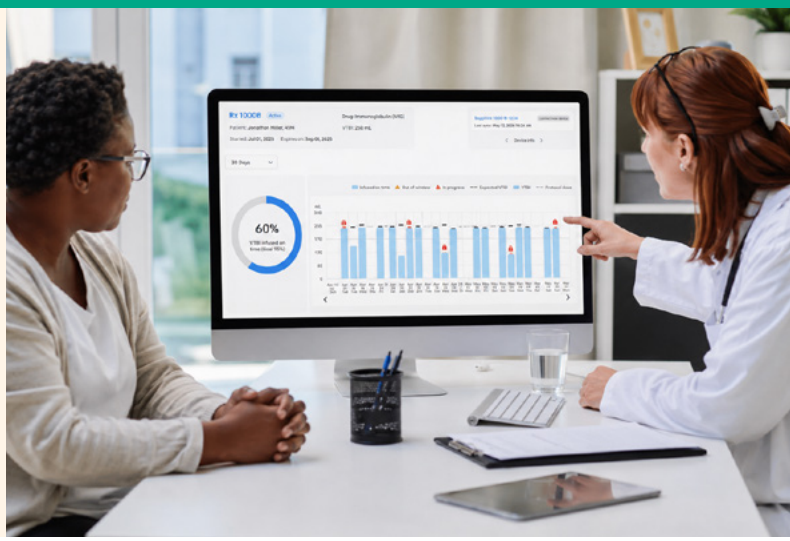


Illustration courtesy of Eitan Medical

Adherence Challenges with HPN Infusion

HPN nonadherence is a complex challenge for both the patients who depend on the therapy and the clinicians who manage their care. Challenges include failure to:[3]

- Infuse the prescribed volume of ordered fluids daily
- Follow proper steps for safe/sterile infusion, including tapering
- Infuse HPN each day it is prescribed
- Understand the importance of the HPN regimen
- Contact the appropriate provider for problems with the infusion pump

HPN Adherence:

- One study found 59.2% of patients fell below the 80% threshold for weekly total volume adherence and tended to skip days.[4]
- Another study reported that 24% of patients had poor adherence, 18% missed infusions, and more than 50% had formulation left in the HPN bag at the end of the infusion.[5]
- HPN nonadherence leads to dehydration, mineral and electrolyte complications, malnutrition, and increased use of healthcare resources, such as emergency department visits.

Clinician Knowledge:

- Clinicians' ability to accurately assess response to therapy, interpret monitoring parameters, and make appropriate therapeutic adjustments relies on an understanding of what patients are actually receiving from their HPN regimen.
- Clues that clinicians can use to help recognize nonadherence to HPN are discrepancies in PN bag counts, excessive quantities of unused supplies, and unexpected laboratory abnormalities that do not respond to dosage adjustments.
- Most infusion pumps are equipped to track usage, and data can be downloaded to provide an activity report that reflects adherence. However, this often requires switching the pump out, and it usually takes considerable time to get this report.[3]
- To add to the complexity, multiple groups of healthcare providers from different organizations are typically involved in the care of each patient receiving HPN, so additional effort is needed for optimal communication and collaboration.[6]

Safety Concerns:

- When the actual HPN infusion volume delivered is unknown, clinicians may prescribe more PN or try to adjust the fluid or electrolytes in order to make up for non-infused PN.
- The clinician's dilemma is: Is the PN prescription wrong, or is the therapy not being administered?
- Should the PN prescription be adjusted according to what the patient is actually infusing? Every one of those decisions (more volume, more electrolytes, a formula change) carries its own risk. Without objective infusion data, each is a guess.

Continued on next page

Improving Patient Adherence

If a clinical team suspects patient nonadherence, there are several things that can be done in an attempt to improve adherence.

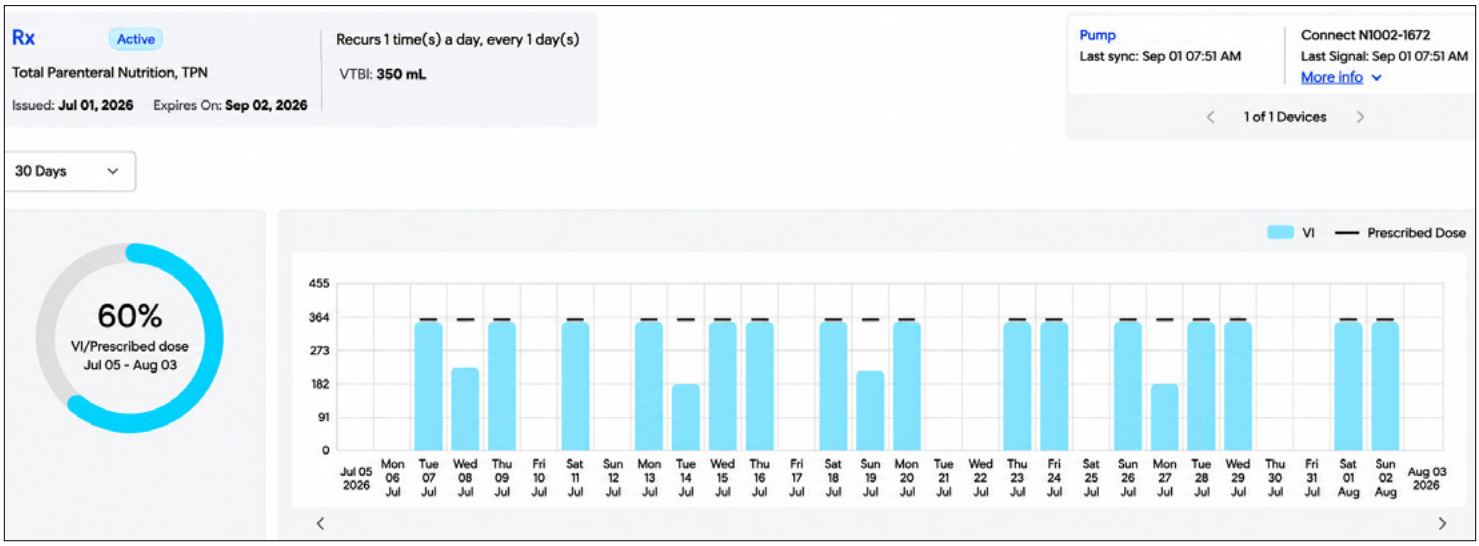
1. **Communication:** Communicate the importance of the HPN infusion and the risks of not infusing all of the formulation or skipping days, and ensure that the patient feels involved in their care.
2. **Development of Patient-Centric HPN:** Involve the patient/caregiver in the decision-making to ensure that the HPN infusions fit into their schedule.
3. **Utilize Pump Technology:** Newer pump technology allows the clinician to obtain near real-time infusion data so clinicians can see how the HPN is being delivered.

Pump Technology to Improve Adherence to HPN

- Newer pump technology with smart features provides data that can be accessed and shared with home care providers, clinicians, and patients.
- Objective adherence data give the care team visibility into how a patient is actually infusing their HPN.
- Form a partnership between care teams and patients, telling the patients/caregivers up front about the technology. Share data with them during clinic visits, create partnership agreements, and work with them to adjust the regimen to improve HPN efficacy and quality of life. Understanding the infusion data makes it possible to adjust the HPN to fit the patient's life.
- Having these illustrative data helps with ongoing patient education and reinforcement of the HPN regimen.
- Collaboration is crucial between the patient care team and the infusion pharmacy/home infusion provider. Shared visibility lets the pharmacy and care teams coordinate adjustments together, rather than working from separate pictures of how a patient's therapy is going.

Real-World Cases

Case 1: A 7-month-old infant with short bowel syndrome began HPN. He had several hospital readmissions with failure to thrive and lack of weight gain. It was suspected that he was not receiving all the HPN. Infusion pump data showed that the infant was receiving only about 60% of the prescribed PN, with some partial infusions and many skipped days. *(See figure below.)* Once the care team shared those data with the caregiver and further educated her on the importance of the full infusion for optimal growth of the infant, adherence to the HPN regimen improved, and the infant was able to develop and thrive.[7] Objective infusion data helped the care team see the infusion volume, so they could educate the caregiver to help the infant receive optimal PN therapy.

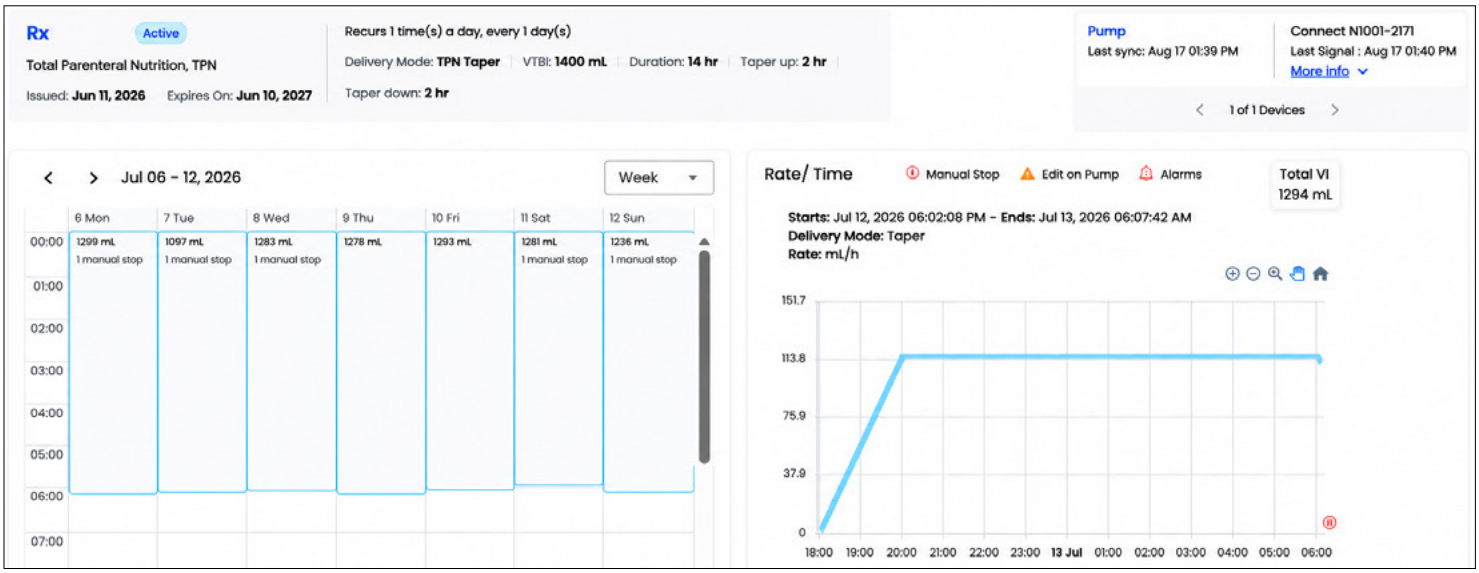


From Eitan Insights – courtesy of Eitan Medical

Continued on next page

Real-World Cases *(continued)*

Case 2: A 75-year-old with type 2 diabetes and chronic intestinal failure required long-term HPN. Routine phone check-ins and bag counts indicated they were fully adherent. However, the patient's laboratory values, particularly potassium and magnesium, had not responded to increases in the HPN solution. The clinician decided to review the remote infusion data, which showed that the infusion stopped approximately 2 hours early at nearly the same time each morning (see figure below). In a patient with diabetes, abrupt HPN discontinuation carries a risk of rebound hypoglycemia. The patient was educated on the risks of stopping the infusion early. The patient mentioned that their work schedule had changed, and they needed to leave earlier for work. The clinician worked with the patient to adjust the infusion hours to a schedule that was more manageable for them. Objective infusion data helped the care team see how the patient was actually receiving therapy, so they could partner with the patient and adjust the regimen to fit the patient's life.



From Eitan Insights – courtesy of Eitan Medical

References

1. National Home Infusion Association. Ensuring sustainable access to home parenteral nutrition (PN): the cost crisis and path forward. 2025. nhia.org/wp-content/uploads/2025/08/PN-Cost-White-Paper-2024.pdf
2. Kirby DF, Mitchell R, Hendrickson E. Noncompliance/nonadherence with home nutrition support: an underrecognized clinical dilemma. *Nutr Clin Pract.* 2017 Dec;32(6):777–781. aspenjournals.onlinelibrary.wiley.com/doi/10.1177/0884533617730001
3. Kumpf VJ. Challenges and obstacles of long-term home parenteral nutrition. *Nutr Clin Pract.* 2019 Apr;34(2):196–203. aspenjournals.onlinelibrary.wiley.com/doi/10.1002/ncp.10258
4. Papier I, Awawdeh E, Bar Yoseph H, et al. Real-time pump telemetry: An innovative approach to monitoring adherence in home parenteral nutrition. *Clin Nutr ESPEN.* 2026 Jun;73:102992. clinicalnutritionespen.com/article/S2405-4577(26)00088-4/abstract
5. Abadie G, Séguy D, Schneider SM, et al. Adherence to home parenteral nutrition and/or intravenous fluid infusions in patients with chronic intestinal failure: A multicenter cross-sectional study. *Nutrition.* 2025 Oct;138:112831. sciencedirect.com/science/article/pii/S0899900725001492?via%3Dihub
6. Kumpf VJ, Gray B, Monczka J, et al. Parenteral nutrition at home/long-term parenteral nutrition. *Am J Health Syst Pharm.* 2024 Jun 13;81(Suppl 3):S112–S120. pmc.ncbi.nlm.nih.gov/articles/PMC11170492/pdf/zxae081.pdf
7. Supporting Treatment Adherence with Remote Infusion Data. 2026. eitanmedical.com/resource-hub/supporting-treatment-adherence-with-remote-infusion-data-2/

Note: This content has been developed for use by healthcare professionals to inform other clinicians and/or patients/caregivers. ASPEN is making this content available for informational purposes only. This content is not based on ASPEN Board-approved documents and should not be confused with ASPEN clinical guidelines, as it was not developed according to ASPEN guideline processes. Recommendations provided here do not constitute medical or other professional advice and should not be taken as such. To the extent that the information presented here may be used to assist in the care of patients, the primary component of quality medical care is the result of the professional judgment of the healthcare professionals providing care. The information presented here is not a substitute for the exercise of professional judgment by healthcare professionals. Circumstances and patient specifics in clinical settings may require actions different from those recommended in this document; in those cases, the judgment of the treating professional should prevail. Use of this information does not in any way guarantee any specific benefit in outcome or survival. This tool is intended to supplement, but not replace, professional training and judgment.

© Copyright 2026 American Society for Parenteral and Enteral Nutrition | 11/24/26