

Ensuring Sustainable Access to Home Parenteral Nutrition (PN): The Cost Crisis and Path Forward

Introduction

Parenteral nutrition (PN) is a life-sustaining therapy for individuals unable to absorb nutrients through their gastrointestinal (GI) tract due to severe medical conditions. Delivered intravenously via a catheter placed in the upper arm or chest, PN provides essential nutrients and electrolytes directly into the bloodstream. This therapy may be temporary or lifelong, depending on the patient's medical condition. According to claims data obtained by the National Home Infusion Association (NHIA), the prevalence of home parenteral nutrition (HPN) between 2022 and 2024 was approximately 32,000 individuals annually.¹ Home parenteral nutrition (HPN) improves clinical outcomes and quality of life, reduces hospital and facility admissions, and significantly lowers healthcare costs. Studies show that HPN reduces direct costs by 32–36% over 1 week to 1 month, primarily by decreasing inpatient resource utilization.^{2,3,4,5} Achieving optimal outcomes for HPN patients requires support from licensed and accredited home infusion pharmacies with dedicated sterile compounding cleanroom facilities and a variety of medical expertise. Pharmacists, nurses, and dietitians specialize in the complex clinical management of HPN and collaborate across sites of care to facilitate transitions and reduce hospital readmissions.

The Problem

The economics of providing HPN are under pressure due to soaring ingredient costs, shortages of ingredients and supplies, scarcity clinical staff with expertise in HPN management, increased regulation for compounding pharmacies, and lagging reimbursement rates.²⁻⁷ Health insurance claims data collected between 2022 and 2024 reported a 15.6% average annual decrease in the number of home infusion pharmacies submitting HPN claims over the 3-year period.¹ Despite the confirmed benefits of HPN, including significant cost savings and improved patient quality of life, the infrastructure for HPN is eroding.^{6,7,8} As a result, patients are experiencing longer facility stays, reduced choice in providers, and greater travel distances to receive essential services.

Causes of Declining Home Infusion Provider Participation

The most significant factor contributing to reduced provider participation in HPN is economics. Payment rates have not kept pace with the growing direct and indirect costs of delivering HPN. NHIA's research shows that between 2016 and 2024, the compounded average cost to prepare a bag of PN rose by 75.4%.^{1,9}

To determine the cost trend for HPN, NHIA collected data from up to 20 unique home infusion pharmacies each year from 2016-2024.^{1,9} Participating pharmacies tracked the direct cost for the HPN ingredients and components using a report developed in collaboration between NHIA and Wellsby, an enterprise software solutions company. The report quantified the cost per bag of HPN by calculating the annual aggregate weighted average of the acquisition cost of all drugs and supplies utilized to prepare each bag of PN. Only drugs added to the bag of HPN by the pharmacy were included in this report. Drugs dispensed separately to the patient for addition to the bag just prior to administration were not included.

NHIA first conducted this study in 2022 to evaluate the impact of pandemic-related supply shortages on the cost of HPN.⁹ Findings from the initial study demonstrated significant cost increases during the COVID-19 Public Health Emergency (PHE) primarily due to shortages of HPN nutrition components, compounding supplies, and sterile empty containers. NHIA recently updated the data from the same initial sites, as well as several additional pharmacies.⁹

The data table represents the costs associated with over 930,000 bags of HPN over the 8-year period from 2016 to 2024 and indicates that the greatest percentage increase in cost coincided with the peak of the COVID-19 pandemic. Notably, costs also experienced significant growth in 2022 and 2023 with cost increases somewhat stabilizing in 2024.

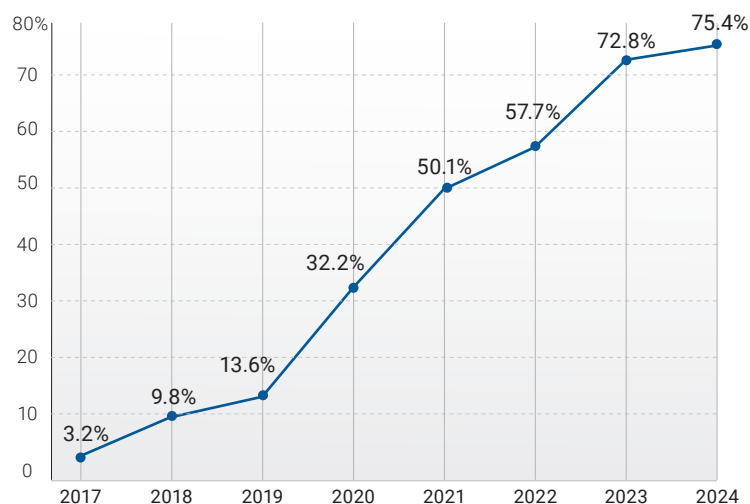
By contrast, an analysis of claims data from 2022 to 2024, which includes payments collected from a combination of payor sources such as commercial insurance, Medicare, and Medicaid, shows that the total monthly payment for a patient on HPN decreased by 5.47%.¹ The data included all services billed on the HPN claims, including nursing and drugs furnished separately from the compounded PN bag. This data demonstrates the disconnect between the economic realities of providing a comprehensive HPN service and the total remuneration received by the home infusion provider.

Providers face an unsustainable situation: while costs rose by a compounded 75.4% from 2016 to 2024, driven by inflation, shortages, and regulatory burdens, the average reimbursement for PN claims, including nursing and

Annual Percent Increase in Cost of Home Parenteral Nutrition

Year	# PN bags in sample	% Increase in cost from previous year
2016	62,800	Baseline
2017	64,502	3.18%
2018	66,976	6.43%
2019	65,259	3.42%
2020	71,651	16.44%
2021	71,752	13.52%
2022	164,792	5.04%
2023	177,107	9.60%
2024	186,398	1.47%

Compounded Cumulative Percentage Increase per Bag of HPN (2017-2024)



additional drugs, declined from 2022 to 2024. This critical disconnect between increasing expenses and decreasing income forces pharmacies out of the service line.

Regulation Changes and Unintended Consequences

The FDA's Unapproved Drug Initiative (UDI) has affected product cost and availability by removing previously available PN ingredients from the market and replacing them with branded products at much higher prices. The new branded drugs are single source, making them more susceptible to shortages. Notably in 2019, American Reagent reformulated IV selenium under UDI, resulting in a 1200% price increase overnight.⁹ For a typical patient in need of selenium the cost for that single ingredient rose from about \$2.13 per day in 2019 to \$23.25 per day in 2025.

Payment Structure for HPN

Under commercial insurance models for home infusion therapy, all drugs are billed separately from the related services, supplies, and equipment. This itemized approach ties reimbursement for each drug to an indexed benchmark—such as Average Wholesale Price (AWP), Wholesale Acquisition Cost (WAC), or Average Sales Price (ASP)—so payments automatically adjust as acquisition costs change.

HPN is an exception. Standard HPN drug components are included as part of bundled rate for services, supplies and equipment. Consequently, drug costs may rise substantially while bundled payment remains static—or even declines—year over year. The widening gap between escalating acquisition costs and unadjusted bundle rates threatens the financial sustainability of HPN services and underscores the need for a more dynamic reimbursement mechanism.

Supply Chain Vulnerabilities

National shortages of HPN components have been a chronic problem in the home and alternate setting for many years. HPN is routinely compounded into individualized formulations by home infusion pharmacies from approximately 24 ingredients, 17 of which have appeared on the American Society of Health-System Pharmacists (ASHP) shortage list in the past 2 years.⁹ ASHP has cited a variety of factors contributing to shortages, including raw material unavailability, manufacturing issues, and increased demand.¹⁰ In addition to HPN providers facing shortages of ingredients, they also face recurring shortages of equipment such as pumps and in-line filters.^{11,12} These issues are exacerbated by medical device recalls, FDA regulatory shifts, and extreme weather events, such as the Hurricane Helene flooding that forced the 5-month closing of Baxter International in North Carolina which focuses on producing HPN components. Patients were required to remain hospitalized, or their HPN formulas were rationed based on critical need. For example, pediatric patients received priority over adult patients during critical shortage of PN components.

Shortages of HPN ingredients and supplies significantly increase stress on health care staff. This leads to increased workload, time away from other responsibilities, and overall workplace stress. The increasing difficulties associated with providing HPN are contributing to a growing trend of providers declining to accept new HPN patients. Tariffs on medical supplies further threaten the stability and affordability of the supply chain. Most alarming, these challenges, alongside others, are prompting more health care professionals to opt out of providing care for HPN patients.

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Labor and Facility Costs

The COVID-19 pandemic significantly impacted labor costs across the United States. According to the Bureau of Labor Statistics, from February 2020 to February 2024, hourly earnings rose from \$28.55 to \$34.56, a gain of 21.1%.¹³ The increase was due to a combination of factors, including increased demand for certain types of workers, labor shortages, and rising inflation. The post-COVID environment also brought an increase in operational expenses including rent, utilities, insurance, accounting and legal fees. Adding to the HPN challenges, USP <797> revisions went into effect November 2023 and require pharmacies to implement updated policies and procedures, train staff on new processes, and establish robust quality assurance and quality control programs for sterile compounding practices.¹⁴ This includes addressing changes in compounding categorization, beyond-use dates (BUDs), and personnel training and competency evaluations. Compliant sterile cleanrooms and staff training add to the cost of HPN. Even though USP <797> compliance is an investment in patient safety and quality of care, it also requires careful planning and significant financial commitment.

Clinical Complexity

HPN is a complex therapy that requires expertise in prescribing, preparation, administration, and monitoring.¹⁵ HPN is also seen as a high-touch service that demands skilled, coordinated clinical management. Pharmacists, nurses, and dietitians collaborate with physicians, conduct lab assessments, and monitor nutrition regimens tailored to each patient's needs. Patient education is crucial and is typically provided by a trained nurse to ensure patients and caregivers understand how to safely manage the therapy. The focus of the training is on providing the patient with the knowledge and skills to safely manage their nutritional support at home. This includes understanding the process of preparing and administering the nutrition solution, assessing for complications, and knowing when to seek medical advice.¹⁵

Pharmacists are central to the process of providing customized parenteral nutrition (PN). They are responsible for accurately preparing the PN formula, overseeing its safe administration, and monitoring patient outcomes, including clinical assessments and adjusting dosages as needed. Pharmacists work closely with the prescriber, family, nurses, and other health care professionals, coordinating medication administration and providing essential patient education.¹⁶ A study published by NHIA in 2022 measured pharmacist tasks and associated time spent managing patients on PN and other therapies. The study included tasks related to 7 home PN patients over 73 study days and concluded that pharmacist tasks range from oversight of the compounding process to performing assessments and

offering clinical monitoring. Moreover, it was determined that pharmacists alone spend an average of 42 minutes per home PN patient per day, a figure that excludes additional personnel and logistics.¹⁷

In addition, home infusion pharmacies usually include dietitians in their clinical teams to ensure appropriate nutrition support for patients receiving parenteral nutrition. These clinicians collaborate with physicians and pharmacists, reviewing lab results and other clinical indicators to monitor patient progress, adjust micro and macro nutrients, and revise care plans when necessary. For example, PN formulations, hydration, and administration strategies may be modified to meet the changing nutritional needs of growing children or patients recovering from surgery; to support participation in sports; or to accommodate for travel. There is no additional reimbursement for dietitian services, but, since most HPN patients can lead active lives outside a facility, dietitians are integral to successful therapeutic support for their participation in activities such as work, school, travel, sports, etc.

Recommendations

Immediate Actions

There needs to be immediate payor recognition of the true costs of providing HPN. Payors should work with their home infusion pharmacies to ensure payment rates account for inflationary pressures. Payors may also consider using alternate coding methodologies to allow separate billing of drugs, rather than using a bundled approach. Allowing all drugs/components to be billed outside of the bundled per diem using National Drug Codes (NDC) and/or Healthcare Common Procedure Coding System (HCPCS) codes, such as the B-codes for nutrients (grams of protein and lipids), is one possible option.

In alignment with payor recognition of the real-world costs, there needs to be adequate in-network participation of qualified pharmacies capable of offering same-day response for nursing and deliveries, which helps prevent ER visits and therapy interruptions.

Long-Term Strategies

NHIA believes that HPN—due to the small population and significant annual spend for health care—is an excellent candidate for value-based programs that incentivize providers to improve quality and expand access. The current per diem payment model for home PN requires a significant level of risk for providers accepting new HPN patients because the services are extensive in the first 1-2 weeks.

NHIA believes payors should explore new payment models that incorporate clinical outcome goals to improve transitions between care settings and lower the total cost of care by reducing infections, emergency room visits, and unplanned

hospitalizations. Additionally, payor policies contributing to the use of the emergency room for complications that could be handled by the home infusion provider should be assessed. For example, blanket caps on the number of allowed home nursing visits or significant patient co-pays for catheter de-clotting agents are counterproductive for HPN patients and can drive up the total cost of care.

Finally, legislative approaches that provide incentives for pharmacies to invest in PN facilities and staff training should be explored. States should examine whether sufficient access exists for HPN among the Medicaid population. This year in Colorado, the General Assembly passed Senate Bill 25-084 which aims to improve Medicaid patient access by increasing the payment for administrative pharmacy services associated with HPN dispensing. The bill was initiated by Children's Hospital Colorado in response to concerns from physicians and

parents after several providers stopped accepting Colorado Medicaid patients due to the extreme gap between the cost of services and the state fee schedule.¹⁸

Conclusion

Home PN is a lifeline for tens of thousands of patients,¹⁹ yet the current reimbursement environment places unsustainable pressure on home infusion providers. NHIA's research highlights the significant disparity between the cost of service and the payment received; a reality that threatens to limit access for the most vulnerable patients.

Future access to HPN depends on swift, coordinated action from payors, legislators, and industry stakeholders. Without meaningful intervention, the erosion of provider participation will continue, leaving patients with longer hospitalizations, increased costs to the health care system, and diminished quality of life.

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