

# Central Vascular Access Device Infection Rates for Home Parenteral Nutrition Patients

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## Introduction

Central vascular access device (CVAD) infections can have a deleterious effect on the successful delivery of infusion therapy, leading to significant morbidity and mortality and increased medical costs. The CDC reports that a single CVAD infection can increase patient cost by an additional \$103,027 per hospital stay. Although CVAD infection rates are often lower in the home infusion population than the hospital population, they remain a persistent issue and are one of the leading causes for rehospitalization in the home care patient. Parenteral nutrition (PN) patients experience higher CVAD infection rates than their non-PN counterparts. Differentiation between these two populations when reporting home CVAD outcomes will create opportunities for identifying improved protocols for risk reduction.

## Background

A national home infusion company collected CVAD outcome data retrospectively from multiple locations. The goal was to quantify the PN CVAD infections as well as other infusion therapy CVAD infections to determine whether the PN CVAD infections were more common than other infusion therapy CVADs. The difference in CVAD infections between PN and non-PN patients has been previously demonstrated in many other publications. This data would be used to determine whether PN CVADs should have a more stringent protocol for antiseptics than their non-PN counterparts in order to reduce or eliminate any gap in CVAD infection rates.

Home infusion reimbursement is meager for CVAD care and maintenance. Most payors provide a daily stipend or "per client" for all supply needs, regardless of the expense associated with those supplies. As a result, home infusion providers have tried to eliminate the utilization of unnecessary/catheter care products in an attempt to manage costs effectively. CVAD infection rates are much lower in the home infusion setting compared to the acute care setting. As a result, many providers believe that the additional cost of antiseptics products is unnecessary.

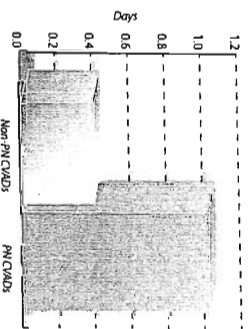
New approaches to CVAD infection prevention, and the goal of zero CVAD infections led this provider to explore correlations between therapy, catheter type and infection rate in order to efficiently apply more stringent catheter care protocols where most necessary.

## Data

Initial data collection showed that for the period of January through June 2010, PN CVADs represented 50 percent of this company's patients hospitalized for CVAD infections, while comprising 16 percent of their CVADs. This finding supported the need for additional documentation collection.

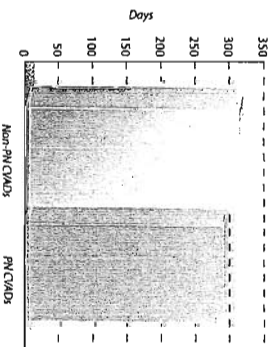
### CVAD Infection Per 1,000 Catheter Days

- A total of 198,335 catheter days were evaluated for 317 patients and 649 CVADs.
- The number of CVAD infections was divided by 198 to report the number of CVAD infections per 1,000 catheter days, an accepted industry standard.
- Non-PN CVADs demonstrated a catheter infection rate of 0.39 per 1,000 catheter days. PN CVADs demonstrated a catheter infection rate of 1.01 per 1,000 catheter days.



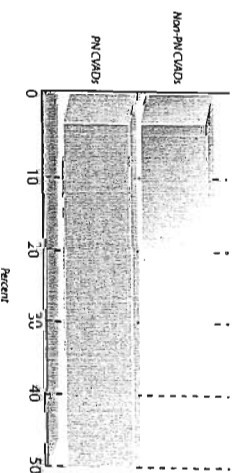
### CVAD Dwell Days

- The average dwell days for the PN CVADs was 286 days, and the average dwell days for the non-PN CVADs was 311 days, or 8.7 percent higher.
- The fact that the slightly higher dwell days occurred with the non-PN population indicates that the higher PN CVAD infection rate did not correlate with extended dwell time.



### Percent of CVADs with Multiple Lumens

- Further analysis found that 50 percent of PN CVADs had multiple lumens or were femoral catheters.
- Only 33 percent of the non-PN CVADs had multiple lumens or were femoral.
- Multiple lumen and femoral catheters have been shown in multiple publications to present a higher infection rate.



## Conclusion

Home infusion PN patients experience a higher CVAD infection rate than non-PN patients. This has also been demonstrated by their hospital-based counterparts. Dwell times did not play a significant role in the rate of CVAD infection; however, the number of CVAD lumens may play a role in the incidence of CVAD infection. The prevention of CVAD infections and their systemic sequelae is the key to better catheter and patient outcomes as well as the reduction of negative economic and clinical impact.

This higher infection rate may support the additional expense of a more detailed catheter care protocol for these higher risk catheters. Attention to this population that results in a lower CVAD infection rate will have a large impact on the overall CVAD infection rate, thus improving provider outcomes.

Future studies should include an in-depth comparison of infection rates between single and multiple lumen CVADs, and the possible impact of additional antiseptics products being included in their catheter care protocol.