

# Catheter-Related Bloodstream Infection Rates in Home Parenteral Nutrition Population Who Received Alteplase Compared to Those Who Did Not Receive Alteplase



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## Purpose

Catheter-related blood stream infection (CRBSI) is the most prevalent vascular access device (VAD) complication in both the hospital and home settings. CRBSIs are associated with high morbidity and mortality as well as increased medical care costs. The objective of this study was to determine whether a correlation exists between the development of biofilm in a catheter (determined by treatment with the tissue plasminogen activator alteplase) and the development of a CRBSI in a large and diverse home total parenteral nutrition (PN) patient population.

## Methodology

A retrospective, non-randomized analysis was completed on 5,619 patients receiving home PN from a single national provider from January 1, 2015 to December 31, 2015. Data collected included demographics, diagnoses, payor, nursing care, Cathflo® Activase® (alteplase) administration by quarter, catheter type, catheter dwell days, number of catheter lumens, catheter events and catheter event date, if indicated. Alteplase was received by 725 of patients analyzed. Results are expressed as the number of CRBSIs per 1,000 catheter days. It was determined whether patients receiving total PN also received alteplase for the treatment of sluggish central venous catheters (CVCs), occluded CVCs, or CVCs that no longer had a blood return. CRBSI rates for these home PN patients who also received alteplase during this period were compared to CRBSI rates for these home PN patients who did not receive alteplase during this period.

## Results

The CRBSI rate for home PN patients who received alteplase for the treatment of catheter occlusion (partial or total) during 2015 was 0.34/1,000 catheter days. The CRBSI rate for PN patients who did not receive alteplase during 2015 was 0.30/1,000 catheter days.

## Conclusion

Biofilm has been shown to be a preferred growth medium for intra- and extra-luminal bacteria. It has been shown that biofilm can begin to grow on artificial surfaces in a patient's body just hours after insertion. There are individual patient variations in the amount of biofilm generated that may contribute to the likelihood of developing a CRBSI. Further research may be warranted to verify whether prophylactic treatment with alteplase is warranted for some patients.

## Discussion

While the overall CRBSI rates did not differ significantly between the patient populations who either did or did not receive alteplase, there were some interesting findings. Of the patients who had a CRBSI and received alteplase, 29 of them (83 percent) received alteplase in the same or a prior quarter to the blood stream infection diagnosis, thus implying that biofilm may have contributed to both events. Also of interest, nine (26 percent) of the CRBSIs reported were experienced by only three patients, who also received multiple doses of alteplase during the same period. This may be an example of how some patients have a higher propensity for generating biofilm than others.

### Reference

<sup>1</sup> <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2631701/pdf/11294723.pdf>

2015 CRBSI	
Total catheter days	802,872
Total # of CRBSIs	242
CRBSI Rate Expressed per 1,000 catheter days	
Overall CRBSI rate	0.30
CRBSI Rate – alteplase recipients	0.34
CRBSI Rate – no alteplase given	0.30

