

## Ethanol lock therapy in reducing catheter-related blood stream infections in home parenteral nutrition patients

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**Background:** Catheter-related blood stream infections (CRBSI) contribute significantly to morbidity, mortality and health care costs in home parenteral nutrition (HPN) patients. Despite improvements in the care of vascular access devices (CVAD) there is still a high prevalence of hospital admissions for CRBSI in HPN patients. The objective of this study is to investigate the efficacy of Ethanol Lock Therapy (ELT) in reducing the incidence of infections in patients with CRBSI in HPN patients.

**Methods:** Medical records from the Cleveland Clinic database of HPN patients with CRBSI placed on prophylactic Ethanol Lock Therapy (ELT) were retrospectively studied from January, 2006 to August, 2009 (N=31). Data collected included demography, diagnosis and laboratory values. CRBSI rates and outcomes were compared pre- and post-ELT with the patients serving as their controls. Diagnosis of CRBSI was based on both clinical symptoms and positive blood cultures. ELT involved instilling sterile ethyl alcohol injection 70-98% daily into each lumen of the CVAD while on HPN. Comparative analysis was performed using McNemar's test and Wilcoxon ranked tests.

**Results:** 31 patients had 273 CRBSI related admissions (10 per 1000 catheter-days) prior to ELT in comparison to 47 CRBSI related admissions post ELT (6.5 per 1000 catheter-days,  $p=0.005$ ). The rate of culture positive CRBSI were 3.53 versus 1.65 per 1000 catheter-days pre and post ELT ( $p=0.01$ ). There was also a statistically significant decrease in the number of catheters removed for CRBSI pre and post ELT ( $p<0.001$ ). ELT was also noted to decrease the recurrence of gram positive and gram negative infections ( $p<0.001$ ). Although, the recurrence of yeast infection decreased following ELT, it did not achieve statistical significant ( $p=0.058$ ). (Table I)

**Table 1: Pre and Post ELT outcomes: Paired Analysis**

Factor	Pre-ELT	Post-ELT	p-value
Admissions	5 (2, 13)	1 (0, 2)	<0.001
Culture + CRBSI	3 (1, 4)	0 (0, 1)	<0.001
# catheters	4 (2, 8)	0 (0, 1)	<0.001
Removed for CRBSI	2 (1, 4)	0 (0, 1)	<0.001
GPC	18 (58.1)	4 (12.9)	<0.001
Yeast	9 (29.0)	3 (9.7)	0.058
GNB	16 (51.6)	4 (12.9)	0.001

Values presented as N (%) for gram-positive cocci (GPC), Yeast and gram-negative bacilli (GNB) and Median (P25, P75) otherwise p-values correspond to McNemar's tests for GPC, yeast and GNB and Wilcoxon signed rank tests otherwise (paired analysis).

**Conclusions:** Our study clearly supports the safety and efficacy of Ethanol Lock Therapy in reducing CRBSI related morbidity in HPN patients. This novel technique will also considerably decrease the burden of CRBSI related health care costs and may have utility also in treating CRBSI in the future.

### Biography

Rex A. Speerhas has work experience at Cleveland Clinic as a staff pharmacist during 1974-1985 after which he was staff Development Specialist from 1985 to 1991, then appointed as Nutrition Support Clinical Specialist from 1991-2013. He was a Certified Diabetes Educator 1990-2012 and Board Certified Nutrition Support Pharmacist since 1994. He made Professional Appointments at The Ohio State University and University of Toledo Schools of Pharmacy. He Authored 6 book chapters and fifteen papers and presented multiple posters at national meetings. He has been managing Home Parenteral Nutrition patients with Dr. Ezra Steiger since 1991. His areas of interest are blood glucose management, trace elements.

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