



## **Ethanol Locks for Reducing Catheter-Related Bloodstream Infections in Infants with Intestinal Failure on Parenteral Nutrition**

### **Purpose:**

To standardize the procedure for safely instilling 70% ethanol lock solutions in pediatric patients with central venous catheters (CVC) to reduce the rate of infections.

### **Definitions:**

Catheter-related bloodstream infection (CRBSI): at least one positive blood culture from the CVC in the absence of another confirmed source of infection (e.g. positive urine, sputum, or peripheral blood culture)

### **Background:**

For pediatric patients with intestinal failure (IF), parenteral nutrition (PN) is a mainstay of therapy and requires a CVC for delivery. Catheter-related bloodstream infections (CRBSIs) are a significant cause of morbidity and mortality in pediatric patients who are PN dependent. Although limited, there is evidence that the use of 70% ethanol locks can reduce the rate of CVC infections in PN-dependent pediatric patients.

### **Inclusion Criteria**

1. Patients scheduled to be discharge home on PN who have a silicone catheter (e.g. Broviac)
2. Inpatients on long-term PN who have a silicone catheter and a history of  $\geq 1$  CRBSI
3. PN infused over 20 hours (or less)

### **Exclusion Criteria**

1. Patients with polyurethane catheters (e.g. PICC)
2. Patients  $< 3$  month corrected age or  $< 5$  kg

### **Protocol**

Eligible patients will receive a 70% ethanol lock solution three times weekly on Monday, Wednesday, and Friday (beginning one week prior to anticipated discharge) for a minimum dwell time of 4 hours, and a heparin lock solution on the alternate days.

### **Procedure for Ethanol Lock**

1. Aseptic technique should be used throughout procedure
2. Scrub access hub connecting site with alcohol for 15 seconds and let dry
3. Flush CVC with NS with 1 mL to ensure patency of catheter
4. Instill 70% ethanol lock solution into the catheter to fill volume

Approved by Neonatal Nutrition and Bone Institute (NNBI) Committee 9/15  
Approved by NICU QAPI Committee 10/15  
Approved by Pediatric P&T Subcommittee 9/15  
Approved by P&T Committee 11/15

Line Type	Ethanol Lock Solution Volume
Broviac 2.7 French	0.5 mL
Broviac 4.2 French	0.5 mL
Broviac 6.6 French	1 mL

5. Clamp catheter and let ethanol solution dwell in catheter for at least 4 hours
6. Flush catheter with 1 mL NS prior to start of next PN bag to ensure patency of catheter (ethanol solution does not need to be withdrawn) **NOTE: the ethanol lock solution is incompatible with heparin solution**

#### **Procedure for Heparin Lock**

1. Aseptic technique should be used throughout procedure
2. Scrub access hub connecting site with alcohol for 15 seconds and let dry
3. Flush CVC with NS with 1 mL to ensure patency of catheter
4. Instill heparin 10 units/1 mL into catheter on days ethanol lock is not used
5. Clamp catheter and let heparin solution dwell in catheter for time PN is not being infused
6. Flush catheter with 1 mL NS prior to start of next PN bag to ensure patency of catheter (heparin solution does not need to be withdrawn)

#### **References**

1. Jones BA, Hull MA, Richardson DS, et al. Efficacy of ethanol locks in reducing central venous catheter infections in pediatric patients with intestinal failure. J Pediatr Surg. 2010; 45:1287-93.
2. Mouw E, Chessman K, Leshner A, et al. Use of an ethanol lock to prevent catheter-related infections in children with short bowel syndrome. J Pediatr Surg. 2008;43(6):1025-9.
3. Wales PW, Kosar C, Carricato M, et al. Ethanol lock therapy to reduce the incidence of catheter-related bloodstream infections in home parenteral nutrition patients with intestinal failure: preliminary experience. J Pediatr Surg. 2011;46(5):951-6.
4. Chhim RF, Crill CM, Collier HK, et al. Ethanol Lock Therapy: A Pilot Infusion Study in Infants. Annals of Pharmacotherapy. 2015;49(4):431-6.

Approved by Neonatal Nutrition and Bone Institute (NNBI) Committee 9/15  
 Approved by NICU QAPI Committee 10/15  
 Approved by Pediatric P&T Subcommittee 9/15  
 Approved by P&T Committee 11/15