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 ≥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
<table>
<thead>
<tr>
<th>Line Type</th>
<th>Ethanol Lock Solution Volume</th>
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</thead>
<tbody>
<tr>
<td>Broviac 2.7 French</td>
<td>0.5 mL</td>
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<tr>
<td>Broviac 4.2 French</td>
<td>0.5 mL</td>
</tr>
<tr>
<td>Broviac 6.6 French</td>
<td>1 mL</td>
</tr>
</tbody>
</table>

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**