**Presentation of the Evidence**

**Literature Review**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Level of Evidence</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chheroke, N. P., Ayesha, K., Liu, T., Sharlene, C. &amp; Steward, L.</td>
<td>2007</td>
<td>II</td>
<td>Catheter significantly more sterile in the ethanol group than the treatment group (P&lt;0.01). Positive culture rates from catheters in the ethanol group were less than the negative group (P&lt;0.009). Cultures were positive in 11/11 saline group and only 3/11 in the ethanol group.</td>
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<tr>
<td>Manjula, M., Rupi, M. &amp; Harrison, E.</td>
<td>2009</td>
<td>II</td>
<td>Ethanol may lead to decreases in CLABSI. Cost-effective option for prevention of CLABSI. Conducting further research using other polyurethane catheters.</td>
</tr>
<tr>
<td>Gharoke, C., Noor, A., Bhattacharya, D. &amp; Wang, P.</td>
<td>2012</td>
<td>I</td>
<td>No difference in outcomes. No statistically significant difference in number of days between study and control. Fornier BLT patients saved study due to CLABSI (P&lt;0.05).</td>
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<tr>
<td>Stoddard, Y., Price, A., Dwyer, P., McPherson, M., Louden, D., Judkins, R. &amp; Chheroke, S.</td>
<td>2008</td>
<td>III</td>
<td>There were no catheter removals for infection in the ethanol group. Ethanol may not be effective against gram-negative bacteria (S. epidermidis).</td>
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<tr>
<td>Siegel, L., Gomberg, J., Safer, R. &amp; Driggers, S. &amp; Estchnic, B., Rosen, V., Kimbrough, W. &amp; Fink, J.</td>
<td>2010</td>
<td>II</td>
<td>CLABSI/0.75% ethanol for 60 seconds in all 12 patients. Efficacy found in 8 out of 12 patients.</td>
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<tr>
<td>Stoddard, C.H., Wurth, L. &amp; Corso, T.</td>
<td>2006</td>
<td>II</td>
<td>Increasing application time (from 5 min to 30 min) helped reduce CLABSI. 10% of patients showed no bacterial colonies, however, a bacitracin 25% and 50% had a rapid rise in bacterial load versus 40% that had virtually no bacterial growth.</td>
</tr>
</tbody>
</table>

**Clinical Question**

**PICO Question**

**Search for Evidence**

**Where did you search for evidence?**
- Cochrane Database
- Using EBSCO Host searching: CINAHL and Medline
- Proquest
- CQV

**Keywords included:** Ethanol lock, ethanol locks, ethanol lock technique, ethanol lock therapy, pediatrics, pediatric CLABSI

**Literature Search:** 48 articles identified. Excluded 11 articles who focused on antibiotic lock therapy exclusively.

**Secondary sources identified through article reference lists and Online publications:**
- Clinical Expertise and Professional Organization List
- Literature search list

**Critical Appraisal of the Evidence**

**Ethanol Lock Therapy:**

Ethanol is both bactericidal and bacteriostatic at concentrations as low as 30%. There is evidence to suggest the use of ethanol lock solution may be effective in preventing and treating CLABSI in the adult population. Although, there is evidence to show ethanol may degrade polyurethane catheters, it has not been shown to be safe when used with silicone catheters. A potential risk for ethanol locks is their introduction, however this has not been demonstrated in the evidence. Due to this risk in pediatrics patients, it is recommended to withdraw ethanol lock solution after usual time is complete.

**Implications for Clinical Practice**

- Ethanol lock therapy is effective in both preventing and treating central line infections.
- Further research on randomized controlled trials is needed for the pediatric patient population.
- The next steps include implementing ethanol lock therapy in the pediatric population and tracking central line infection rates after implementation.

**Reference list available on request**