Tetrasodium Ethylenediaminetetraacetic Acid for Locking Central Venous Access Devices: Clinical Effectiveness, Cost-Effectiveness, and Guidelines
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Research Questions

1. What is the clinical effectiveness of 4% tetrasodium ethylenediaminetetraacetic acid (EDTA) for locking central venous access devices (CVAD)?

2. What is the cost-effectiveness of 4% tetrasodium EDTA for locking CVADs?

3. What are the evidence-based guidelines regarding the use of CVADs?

Key Findings

One randomized controlled trial was identified regarding 4% tetrasodium ethylenediaminetetraacetic acid (EDTA) for locking central venous access devices (CVADs). In addition, one evidence-based guideline was identified regarding the use of CVADs. No relevant economic evaluations were identified regarding the cost-effectiveness of 4% tetrasodium EDTA for locking CVADs.

Methods

A limited literature search was conducted on key resources including Ovid Medline, Embase, the Cochrane Library, University of York Centre for Reviews and Dissemination (CRD), and CINAHL databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic studies, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and April 2, 2019. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

<table>
<thead>
<tr>
<th>Population</th>
<th>Patients with central venous access devices (CVADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Q1.2: 4% tetrasodium ethylenediaminetetraacetic acid (EDTA) for locking CVADs (e.g., KiteLock, Cathasept)</td>
</tr>
<tr>
<td>Comparator</td>
<td>Q1.2: Heparin solutions; Saline; Antibiotic lock solutions; Combination solutions (e.g., TauroLock); Ethyl alcohol; Standard of care (other preparations)</td>
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</table>
Outcomes

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
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<tbody>
<tr>
<td>Q1</td>
<td>Clinical effectiveness (e.g., catheter associated infection rates, catheter occlusion rates) and safety (e.g., side effects, adverse effects, hypocalcaemia rates, other divalent or trivalent metal deficiencies, all-cause infection rates)</td>
</tr>
<tr>
<td>Q2</td>
<td>Cost-effectiveness (e.g., incremental cost per health benefit gained)</td>
</tr>
<tr>
<td>Q3</td>
<td>Guidelines (e.g., appropriate use)</td>
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</tbody>
</table>

Study Designs

Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

One randomized controlled trial (RCT) study was identified regarding 4% tetrasodium ethylenediaminetetraacetic acid (EDTA) for locking central venous access devices (CVADs). In addition, one evidence-based guideline was identified regarding the use of CVADs. No relevant health technology assessments, systematic reviews, meta-analyses, non-randomized studies and economic evaluations were identified regarding use of 4% tetrasodium EDTA for locking CVADs.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

The identified RCT study\(^1\) assessed whether tetra-sodium EDTA solution (Cathasept) was effective in reducing catheter-related bloodstream infections (CRBSIs) compared to heparin solution in patients receiving hemodialysis. Subjects were randomized to either the Cathasept group or heparin group to estimate the difference in microbial colonization, CRBSI rate, catheter patency, inflammatory biomarkers and anemia between groups.\(^1\) Overall, the researchers concluded that the Cathasept group had lower microbial colonization rates and CRBSI rates compared to the heparin group. However, the Cathasept group had lower blood flow rates and increased thrombotic complications although the safety profile was comparable between groups.\(^1\)

The evidence-based guideline\(^2\) sought to identify the appropriate lock solution for central venous catheters, excluding dialysis catheters. The authors of the guideline\(^2\) conclude there is no evidence supporting the heparin lock with the most appropriate lock solution containing citrate or taurolidine for unidentified patient populations.

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.
Randomized Controlled Trials


Non-Randomized Studies

No relevant literature identified.

Economic Evaluations

No literature identified.

Guidelines and Recommendations

Appendix — Further Information

Previous CADTH Reports


Randomized Controlled Trials

Alternative Formulations of EDTA


7. Luiz MV, Scavone C, Tzanno C. The CLOCK trial, a double-blinded randomized controlled trial: trisodium citrate 30% and minocycline 3 mg/mL plus EDTA 30 mg/mL are effective and safe for catheter patency maintenance among CKD 5D patients on hemodialysis. Hemodial. 2017 04;21(2):294-304. PubMed: PM27670267


Non-randomized Studies

**Alternative Formulations of EDTA**

   PubMed: PM29927699

**In Vitro Studies**

   PubMed: PM30487154

   PubMed: PM25712314

**Review Articles**


   PM:30149607

**Additional References – Conference Abstracts**
