De-Implementation of Heparin and Implementation of Saline for Central Venous Catheter Flush/Lock in Adults

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2019 Fuld Institute for EBP National Summit
Clinical questions are triggers for EBP

What is the best flush solution for central venous catheters in adults?

Triggers
- New evidence and guidelines
- Lack of standardization
- Not following policy - risk
The Iowa Model was used to guide the EBP process.

In adults is saline compared to heparin for central line intermittent flush/locking effective for prevention of occlusion and what are the overall benefits and harms?
Evidence was assembled and appraised by the team using a standardized approach.

Assemble, Appraise and Synthesize Body of Evidence

- Conduct systematic review
- Weigh quality, quantity, consistency and risk
Evidence of heparin or saline superiority was lacking, insufficient or inconsistent

<table>
<thead>
<tr>
<th>Type</th>
<th>Evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic Reviews (6)</td>
<td>• No superiority, insufficient evidence</td>
<td>Anderson et al., 2010, Dal Molin et al., 2014, dos Santos et al., 2015, Lopez-Briz et al., 2014, Mitchell et al., 2009, Zhong et al., 2017</td>
</tr>
<tr>
<td>RCT (8)</td>
<td>• No superiority, insufficient evidence</td>
<td>Bowers et al., 2008, Dal Molin et al., 2015, Goossens et al., 2013, Heidari et al., 2015, Klein et al., 2018, Lyons &amp; Phalen, 2014, Schallom et al., 2012</td>
</tr>
<tr>
<td></td>
<td>• Heparin (high dose)</td>
<td>Rabe et al., 2002</td>
</tr>
<tr>
<td>Observational (3)</td>
<td>• No superiority</td>
<td>Bertoglio et al., 2012</td>
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<tr>
<td></td>
<td>• Heparin</td>
<td>Jonker et al., 2010, Smith et al., 2017</td>
</tr>
<tr>
<td>Consensus (1)</td>
<td>• Saline lock is as appropriate</td>
<td>Pittiruti et al., 2016</td>
</tr>
</tbody>
</table>
It’s not what you flush with, but how you flush.

- National practice standards
  - Oncology Nursing Society Access Device Standards of Practice Camp-Sorrell & Matey 2017
  - Infusion Nurses Society Policies and Procedures for Infusion Therapy INS, 2016
  - American Society of Clinical Oncology Schiffer et al., 2013
- Manufacture recommendations
- Scientific principles
  - Heparin half life < 2 hours Cook, 2010
  - Push Pause Pittiruti et al., 2016
Multiple implementation strategies were used.

Cullen & Adams, 2012
Flushing Central Lines, PICCs, and Ports in Adults
Barriers were expected.

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Cullen et al., 2017
De-implementation strategies were needed to move away from heparin flush/lock.

De-implementation, de-innovation or de-adoPTION stopping practices that are not evidence-based, removal of interventions that do not improve care, are ineffective and may be harmful.
De-implementation may require additional or different strategies.
De-implementation strategies depend on the type of change.

<table>
<thead>
<tr>
<th>Description</th>
<th>Partial Reversal</th>
<th>Complete Reversal</th>
<th>Related Replacement</th>
<th>Unrelated Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing the frequency or narrowing subgroup of practice</td>
<td>Universal discontinuing of ineffective practice</td>
<td>Substituting existing practice with a closely related more effective intervention</td>
<td>Substituting existing practice with more effective intervention that is unrelated to standard care</td>
<td></td>
</tr>
<tr>
<td>No new skills</td>
<td>Adoption of new evidence</td>
<td>Adoption of new innovation that fits practice and expectations</td>
<td>Adoption of new evidence</td>
<td>Re-engineer clinical processes to facilitate innovation as new routine</td>
</tr>
<tr>
<td>System and tools to identify target population New policy and procedures</td>
<td>Policy and procedures to abandon practice</td>
<td>Train/educate away from outmoded practice Policy and procedure to discontinue old practice</td>
<td>Train/educate away from outmoded practice Policy and procedure to discontinue old practice</td>
<td></td>
</tr>
</tbody>
</table>
Additional strategies were needed to de-implement heparin.

- Order in the MAR:

- Admin instructions link will open this table:

<table>
<thead>
<tr>
<th>Device</th>
<th>Flush Frequency</th>
<th>Flush Volume and Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solo PICC (valved)</td>
<td>At least weekly</td>
<td>10 mL NS</td>
</tr>
<tr>
<td>Non-Solo PICC (non-valved, clamps)</td>
<td>At least every 12 hours</td>
<td>10 mL NS</td>
</tr>
<tr>
<td>Subclavian, Jugular, Femoral</td>
<td>At least daily</td>
<td>10 mL NS</td>
</tr>
<tr>
<td>Hickman or Power Line</td>
<td>At least 3 times a week: Monday, Wednesday, Friday</td>
<td>10 mL NS</td>
</tr>
<tr>
<td>Groshong</td>
<td>At least daily</td>
<td>10 mL NS</td>
</tr>
<tr>
<td>Implanted Ports</td>
<td>At least monthly</td>
<td>10 mL NS</td>
</tr>
</tbody>
</table>

- Document flush in the LDA using options listed below:
Use data to make decisions.

Total PICCs 10% TPA
Non-solo PICCs 20% TPA and wider variability
Rates not change in 2 months compared to previous data

Re-infusion
Documentation
Monitoring
Think strategically about pairing strategies for implementation and de-implementation.

Implementation- De-Implementation

Strategies for effort-neutral change

Do more
Do less

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References


