The Problem with Evidence - The Thorny Relationship of Infection Control and Evidence Based Practice

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www.webbertraining.com

November 20, 2017

“Evidence based medicine is the integration of the best research evidence with clinical expertise and patient values…”

David Sackett

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Broadcast live from the 2017 conference of the Australasian College of Infection Control
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Infection Control and Evidence Based Medicine

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`EBM` is easy to say but hard to do...

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Cochrane Database of Systematic Reviews

Clinically-indicated replacement versus routine replacement of peripheral venous catheters

Joan Webster, Sonya Osborne, Claire M Rickard, Karen New

First published: 14 August 2015

Editorial Group: Cochrane Vascular Group

DOI: 10.1002/14651858.CD007798.pub4 View/save citation

Cited by (CrossRef): 4 articles Check for updates Citation tools
Main results

Seven trials with a total of 4895 patients were included in the review. The quality of the evidence was high for most outcomes but was downgraded to moderate for the outcome catheter-related bloodstream infection (CRBSI). The downgrade was due to wide confidence intervals, which created a high level of uncertainty around the effect estimate. CRBSI was assessed in five trials (4806 patients), there was no significant between-group difference in the CRBSI rate (clinically- indicated: 172365, routine change: 0.2441). The risk ratio (RR) was 0.61 (95% CI 0.08 to 4.68; P = 0.64). No difference in phlebitis rates was found whether catheters were changed according to clinical indications or routinely (clinically- indicated: 166/2365; 3-day change 166/2441; RR 1.14, 95% CI 0.93 to 1.39). This result was unaffected by whether infusion through the catheter was continuous or intermittent. We also analysed the data by number of device days and again no differences between groups were observed (RR 1.03, 95% CI 0.84 to 1.27; P = 0.75). One trial assessed all-cause bloodstream infection. There was no difference in this outcome between the two groups (clinically- indicated: 4/1593 (0.2%); routine change 9/1690 (0.5%); P = 0.21). Cannulation costs were lower by approximately AUD 7.00 in the clinically- indicated group (mean difference (MD) -6.96, 95% CI -9.05 to -4.86; P = 0.00001).

Authors’ conclusions

The review found no evidence to support changing catheters every 72 to 96 hours. Consequently, healthcare organisations may consider changing to a policy whereby catheters are changed only if clinically indicated. This would provide significant cost savings and would spare patients the unnecessary pain of routine re- sites in the absence of clinical indications. To minimise peripheral catheter-related complications, the insertion site should be inspected at each shift change and the catheter removed if signs of inflammation, infiltration, or blockage are present.

7 studies INCLUDED in the Cochrane review


3. Rickett CM, McLean D, Mulvigna, A, McInnes, M, (2010). Routine re-siting of peripheral intravenous devices every 3 days does not reduce complications compared with clinically re-sited, a randomised controlled trial. BMC Medicine. 8:31.


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Best practice recommendations

The results from this review suggest that peripheral venous catheters should be replaced when clinically indicated for those patients who receive intravenous therapy in acute and community settings. The evidence recommends discouraging the routine change of catheters every 72-96 hours.

The full review report, including references, can be accessed here.

Dora Lang is a group member of the National Cancer Institute Singapore, National University Health System, and a member of the Cochrane Nursing Care Field.

<table>
<thead>
<tr>
<th>Risk of catheter-related bacteraemia(^1)</th>
<th>0.03% - 0.18%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients in meta-analysis(^2)</td>
<td>4806</td>
</tr>
<tr>
<td>Expected number of bacteraemias</td>
<td>1 - 4</td>
</tr>
<tr>
<td>Observed number of bacteraemias in meta-analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

30-80% of patients have a PIVC during a hospital stay¹

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Abstract
Short-term peripheral venous catheters (PVCs) are commonly used in healthcare settings. To determine the magnitude of bloodstream infections (BSIs) related to their use, PubMed, article bibliographies, and the authors’ library were searched for pertinent articles. The incidence of PVC-related BSIs was 0.18% among 85643 PVCs. Short-term PVCs accounted for a mean of 6.3% and 23% of nosocomial BSIs and nosocomial catheter-related BSIs, respectively. Prolonged dwell time and catheter insertion under emergent conditions increased risk of PVC-related bloodstream infection (PVCR-BSI). If approximately 200 million PVCs are successfully inserted into adult patients each year in the United States, there may be many PVCR-BSIs occurring yearly. Clinicians should obtain blood cultures in patients with evidence of PVC infection and systemic symptomatology such as fever, carefully inspect the PVC insertion site in bacteremic or fungemic patients, and remove PVCs associated with localized infection with or without associated BSI.


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Peripheral cannula-related BSI in the ACT 2016

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ACT public hospital separations</td>
<td>68,000</td>
</tr>
<tr>
<td>Estimated number of patients with IVC (@30%)</td>
<td>20,400</td>
</tr>
<tr>
<td>Expected number PIVC-related bloodstream infections/year (@0.05 - 0.1%)</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Observed number PIVC-related BSI/year</td>
<td>~ 8</td>
</tr>
</tbody>
</table>

1. Represents TCH and Calvary Hospital; data on PIVC BSI only available from TCH

Estimate of PIVC used annually in Australia

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total hospital separations</td>
<td>10,599,768</td>
</tr>
<tr>
<td>Estimated number of patients with IVC (@30%)</td>
<td>~ 3,000,000</td>
</tr>
<tr>
<td>Expected number PIVC-related bloodstream infections/year (@0.05 - 0.1%)</td>
<td>1,500 - 3,000</td>
</tr>
</tbody>
</table>

1. AIHW data - public and private hospitals 2015-16
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In-hospital outcomes of healthcare-acquired BSI TCH 2016

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovered</td>
<td>80.00%</td>
</tr>
<tr>
<td>New morbidity/ongoing sepsis</td>
<td>20.00%</td>
</tr>
<tr>
<td>Dead</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Expected number PIVC-related bloodstream infections/year (@0.05 - 0.1%) 1,500 - 3,000
Expected deaths in hospital (8% mortality) 120 - 240
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Meningococcal infection in Australia 2016

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<tbody>
<tr>
<td>Number of cases</td>
<td>254</td>
</tr>
<tr>
<td>Deaths</td>
<td>~25</td>
</tr>
<tr>
<td>PBS vaccination costs</td>
<td>~$15 million</td>
</tr>
</tbody>
</table>

How do you reduce the infection-related mortality of PIVCs?

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‘...PIVC-associated SAB were associated with a 30-day all-cause mortality rate of 26.5%...’

NOT AN RCT
The gold standard is a systematic review of a number of RCTs
- RCTs are expensive
- RCTs may lack the power to demonstrate a small reduction in risk
- In the absence of adequate RCTs we must rely on ‘lower levels’ of evidence

‘...the excellent is the enemy of the good…’

Voltaire (1694 - 1778)

‘...Can’t stop the memory that goes climbing through my brain
I get no answers
So the question still remains…’

From the 1976 song ‘Am I ever gonna see your face again?’ by The Angels

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Summary

- EBM offers powerful tools to help us practice infection control safely, effectively and efficiently
- Must choose the right tool and use it properly
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November 21, 2017
THE ROLE OF RAPID DIAGNOSTICS IN PREVENTING HEALTHCARE INFECTION
Speaker: Dr. Hilary Humphreys, The Royal College of Surgeons in Ireland

December 7, 2017
BEYOND HIGH-TOUCH SURFACES: FLOORS, PORTABLE EQUIPMENT, AND OTHER POTENTIAL SOURCES OF HEALTHCARE INFECTION TRANSMISSION
Speaker: Prof. Curtis J. Donskey, Case Western Reserve University, Cleveland

December 14, 2017
ENHANCED PERFORMANCE FEEDBACK AND PATIENT PARTICIPATION TO IMPROVE HAND HYGIENE COMPLIANCE
Speaker: Dr. Hugo Sax, University of Zurich Hospitals, and Dr. Andrew Stewardson, Hand Hygiene Australia

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