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[Intervention Review]

# Clinically-indicated replacement versus routine replacement of peripheral venous catheters

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## ABSTRACT

### Background

US Centers for Disease Control guidelines recommend replacement of peripheral intravenous (IV) catheters no more frequently than every 72 to 96 hours. Routine replacement is thought to reduce the risk of phlebitis and bloodstream infection. Catheter insertion is an unpleasant experience for patients and replacement may be unnecessary if the catheter remains functional and there are no signs of inflammation. Costs associated with routine replacement may be considerable. This is an update of a review first published in 2010.

### Objectives

To assess the effects of removing peripheral IV catheters when clinically indicated compared with removing and re-siting the catheter routinely.

### Search methods

For this update the Cochrane Vascular Trials Search Co-ordinator searched the Cochrane Vascular Specialised Register (March 2015) and CENTRAL (2015, Issue 3). We also searched clinical trials registries (April 2015).

### Selection criteria

Randomised controlled trials that compared routine removal of peripheral IV catheters with removal only when clinically indicated in hospitalised or community dwelling patients receiving continuous or intermittent infusions.

### Data collection and analysis

Two review authors independently assessed trial quality and extracted data.

## 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 1/2365; routine change 2/2441). 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 186/2365; 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 (0.02%); routine change 9/1690 (0.05%);  $P = 0.21$ ). 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;  $P \leq 0.00001$ ).

## 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.

## PLAIN LANGUAGE SUMMARY

### Replacing a peripheral venous catheter when clinically indicated versus routine replacement

#### Background

Most hospital patients receive fluids or medications via an intravenous catheter at some time during their hospital stay. An intravenous catheter (also called an IV drip or intravenous cannula) is a short, hollow tube placed in the vein to allow administration of medications, fluids or nutrients directly into the bloodstream. These catheters are often replaced every three to four days to try to prevent irritation of the vein or infection of the blood. However, the procedure may cause discomfort to patients and is quite costly.

#### Study characteristics and key results

This review included all of the randomised controlled trials (current up to March 2015), which have compared routine catheter changes with changing the catheter only if there were signs of inflammation or infection. We measured catheter-related blood stream infection, phlebitis and other problems associated with peripheral catheters, such as local infection and catheter blockage. There was no difference between the groups on any of these measures. However, we did find that it costs less, on average, when catheters were replaced when there was a clinical indication to do so, compared with routine changes.

#### Quality of the evidence

The overall quality of the evidence was rated as being high for most of the outcomes. There was some uncertainty for the outcome 'catheter related blood stream infection', so the evidence for that outcome was downgraded to moderate. We found no evidence of benefit to support current practice of changing catheters routinely every three to four days.