

# Saline Versus Heparin for Maintaining the Patency of Central Venous Catheters: A Review

## Context

A central venous catheter is a tube inserted into a large vein in order to administer medication, provide nutrition, obtain blood samples, or monitor hemodynamic parameters such as blood pressure or heart rate. Blood clots may form within the catheter, reducing its functionality. Therefore, it is important to keep central venous catheters from becoming blocked so that they continue to work effectively.

## Technology

To maintain the patency of central venous catheters, they must be regularly flushed. Saline and heparin are the most commonly used flushing solutions.

## Issue

While both saline and heparin are effective for maintaining catheter patency, it is believed that heparin may have the added benefit of preventing blood clots from forming in the catheter. However, heparin may also be associated with adverse effects such as heparin-induced thrombocytopenia, and heparin dosing errors may lead to an increased risk of bleeding. A review of the clinical effectiveness and safety of saline compared with heparin for maintaining the patency of central venous catheters will help inform decisions on which solution to use for catheter flushing.

## Methods

A limited literature search was conducted of key resources, and titles and abstracts of the retrieved

publications were reviewed. Full-text publications were evaluated for final article selection according to predetermined selection criteria (population, intervention, comparator, outcomes, and study designs).

## Key Messages

When comparing saline with heparin for maintaining the patency of central venous catheters:

- In adult patients, it is unclear which solution is more effective.
- In pediatric patients, saline may be less effective; however, this finding should be interpreted with caution because the difference was statistically significant in only two of the three studies.
- It is unclear whether saline is safer than heparin.

## Results

The literature search identified 101 citations, with an additional article identified from other sources. Of these, 20 were deemed potentially relevant and 8 met the criteria for inclusion in this review — 2 systematic reviews, 4 randomized controlled trials, and 2 non-randomized studies.

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