Can we replace heparin with saline in long term central venous catheters in children?

A central venous catheter (CVC) is a long, thin, flexible tube which is inserted into a large central vein. This enables access to the blood stream for people with serious medical conditions to receive medications and fluids, as well as the collection of blood specimens. Long term central venous catheters are used to access the blood system in children with complex medical conditions like cancer. To stop the catheter from becoming blocked it is usual to use heparin, a drug that prevents clots forming, to flush the catheter. However, some studies have shown that heparin is not necessary, and that normal saline (a sterile salt water solution) can be safely used instead. Heparin may be associated with complications, such as bleeding and infection, along with higher costs for health care providers. While the complications such as infections and occlusions are uncommon, practices vary around the world and there are many inconsistencies regarding the best flush solution to use to prevent complications in long term catheters.

Study characteristics and key results
This review included randomised controlled trials, (clinical studies where people were randomly assigned into one of two or more treatment groups), that compared the use of saline and heparin to prevent blockage, and other complications related to long term catheters. The evidence is current to April 2015. Two review authors independently reviewed the studies. Three studies with a total of 245 participants were included in the review. The three trials directly compared the use of saline and heparin, however, between studies, all were very different in the way they compared saline and heparin, with different concentrations of heparin and different frequency of flushes reported. We were able to combine the results of two studies; the analysis showed imprecise results for the blocking of catheters and blood stream infections between normal saline and heparin. One study reported the duration of catheter placement to be similar between the two study arms.

Quality of the evidence
The overall quality of the evidence ranged from low to very low. There was high risk of bias for blinding, there were differences between the studies methods and interventions, inconsistent results between the studies, and not all studies reported all outcomes of interest. We found there was not enough evidence to determine which solution, heparin or saline, is more effective for reducing complications. Further research is required and is likely to have an important impact in this area.

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Heparin versus 0.9% sodium chloride intermittent flushing for the prevention of occlusion in long term central venous catheters in infants and children: A systematic review.
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