



Can Saline replace heparin to prevent occlusion in long term CVCs in children and adolescents?



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Acknowledgments

- Co-authors
 - Rachel Edwards
 - Raymond Chan
- Cochrane Collaboration
- Qld Cancer Council

Overview

- How the study came about
- Why this is an important issue
- Undertaking a Cochrane review
- The results
- Where to next?



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How the study came about

- Experienced nurses in childhood cancer
- Interested in developing nursing research- but where to start?
- Collaboration
- Development of research ideas
- Decision to undertake a Cochrane review



Choosing the topic and question

- Clinically important
- Potential to improve practice
- Nursing orientated- but relevant to other disciplines
- Needed evidence to exist but not be overwhelming for first-time Cochrane review



The research question

What are the clinical effects (benefits and harms) of heparin versus normal saline to prevent occlusion in long-term central venous catheters in infants, children and adolescents?



VS



Why is this an important issue?

- Worldwide, guideline and clinical practice vary
- Even in our own institution
 - Cancer patients have CVLs & ports heparinised
 - Haemophilia patients use saline only
- No clear understanding of which is superior
- Costs and risks of heparin
- Medication errors- heparin one of the most common errors reported

The evidence

- Adult Cochrane review on same topic (Lopez 2014)
 - No important difference in terms of safety or efficacy
 - Challenge the continued use of heparin
- One study changed practice on the basis of their study in the 1990's- use saline only over age one (Smith 1991)
- Recent systematic review advocated daily heparin as this was practiced amongst facilities surveyed (Conway 2014)

Undertaking a Cochrane review

- Registering title
- Preparing protocol
- Publishing protocol
- Undertaking review
- Publishing results
- Training and support provided
- Rigorous, lengthy process



The review

- Undertaken according to rigorous Cochrane standards,
 - Search, data extraction, analysis, write up
- 137 articles potentially relevant
- 3 studies included in final review
 - 245 patients
 - 2 studies CVL, 1 study port-a-cath



Outcome Measures

- Occlusion (inability to infuse)
- CVC associated blood stream infection
- Converted to rate ratios per 1000 catheter days
- Other measures not able to be combined
 - Ability to withdraw blood
 - Catheter duration
 - Use of urokinase



Quality and bias of studies

- All studies used different protocols- difficult to compare
- Different concentrations of heparin
- Confounding in 2 studies changing not only the solution, but also duration between flushes
- Study quality low to very low with bias in multiple areas

Results

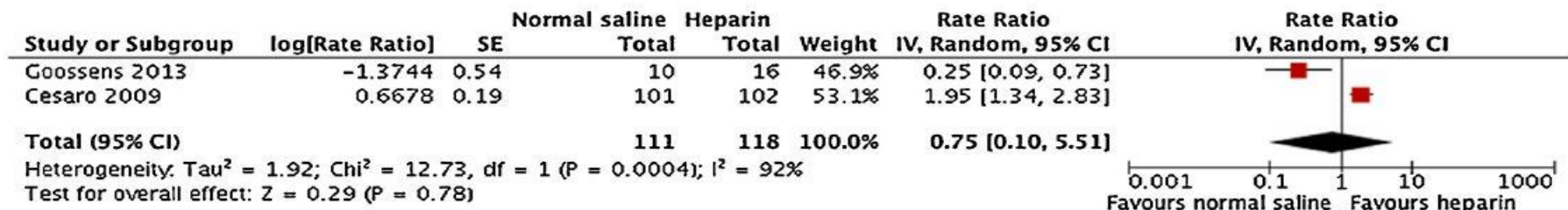
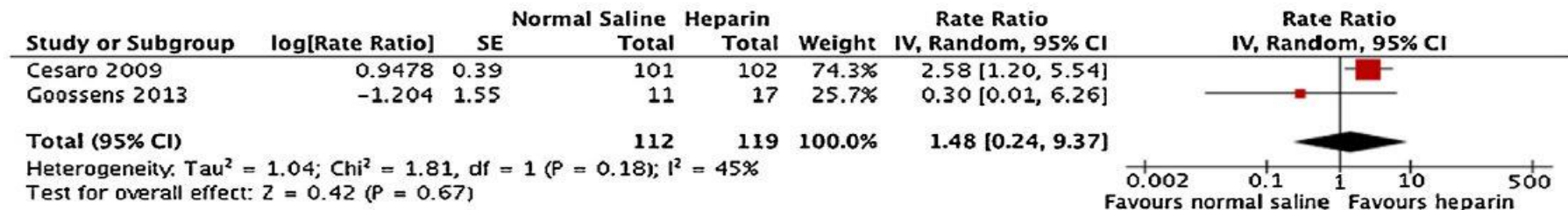


Fig. 2. Forest plot comparison: normal saline versus heparin flush, outcome CVC occlusion rate per 1000 catheter days.



Results

- Inconsistent and imprecise
- All studies had risk of bias and problems with internal validity
- Insufficient evidence to determine effects of heparin versus normal saline
- Controversy continues...



Conclusions

- It remains unclear whether heparin is necessary for CVC maintenance
- Saline is cheaper; heparin is not risk free
- More well-designed studies are required to understand this relatively simple, but clinically important question
- Nurse are ideally placed to undertake this research



Summary

Cochrane Database of Systematic Reviews



Trusted evidence.
Informed decisions.
Better health.

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

Review Intervention

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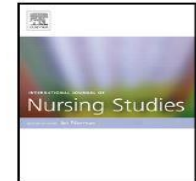


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Review

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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Thank you



Australian Government
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