Intravenous literature: Lai, N.M., Chaiyakunapruk, N., Lai, N.A., O'Riordan, E., Pau, W.S. and Saint, S. (2013) Catheter impregnation, coating or bonding for reducing central venous catheter-related infections in adults. Cochrane Database Systematic Review. 2013 Jun 6;6:CD007878. .

Abstract:

BACKGROUND: The central venous catheter (CVC) is a commonly used device in managing acutely ill patients in the hospital. Bloodstream infections are major complications in patients who require a CVC. Several infection control measures have been developed to reduce bloodstream infections, one of which is CVC impregnated with various forms of antimicrobials (either with an antiseptic or with antibiotics).

OBJECTIVES: We aimed to assess the effects of antimicrobial CVCs in reducing clinically diagnosed sepsis, established catheter-related bloodstream infection (CRBSI) and mortality.

SEARCH METHODS: We used the standard search strategy of the Cochrane Anaesthesia Review Group (CARG). We searched MEDLINE (OVID SP) (1950 to March 2012), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, Issue 3, 2012), EMBASE (1980 to March 2012), CINAHL (1982 to March 2012) and other Internet resources using a combination of keywords and MeSH headings.

SELECTION CRITERIA: We included randomized controlled trials that assessed any type of

impregnated catheter against either non-impregnated catheters or catheters with another impregnation. We excluded cross-over studies.
DATA COLLECTION AND ANALYSIS:
We extracted data using the standard methods of the CARG. Two authors independently assessed the relevance and risk of bias of the retrieved records. We expressed our results using risk ratio (RR), absolute risk reduction (ARR) and number need to treat to benefit (NNTB) for categorical data and mean difference (MD) for continuous data where appropriate with their 95% confidence intervals (CIs).

MAIN RESULTS: We included 56 studies with 16,512 catheters and 11 types of antimicrobial impregnations. The total number of participants enrolled was unclear as some studies did not provide this information. There were low or unclear risks of bias in the included studies, except for blinding, which was impossible in most studies due to different appearances between the catheters assessed. Overall, catheter impregnation significantly reduced CRBSI, with an ARR of 2% (95% CI 3% to 1%), RR of 0.61 (95% CI 0.51 to 0.73) and NNTB of 50. Catheter impregnation also reduced catheter colonization, with an ARR of 10% (95% CI 13% to 7%), RR of 0.66 (95% CI 0.58 to 0.75) and NNTB of 10. However, catheter impregnation made no significant difference to the rates of clinically diagnosed sepsis (RR 1.0 (95% CI 0.88 to 1.13)) and all-cause mortality (RR 0.88 (95% CI 0.75 to 1.05)).In our subgroup analyses, we found that the magnitudes of benefits for impregnated CVCs varied in studies that enrolled different types of participants. For the outcome of catheter colonization, catheter impregnation conferred significant benefit in studies conducted in intensive care units (ICUs) (RR 0.68 (95% CI 0.59 to 0.78)) but not in studies conducted in haematological and oncological units (RR 0.75 (95% CI 0.51 to 1.11)) or studies that assessed predominantly patients who required CVCs for long-term total parenteral nutrition (TPN)(RR 0.99 (95% CI 0.74 to 1.34)). However, there was no such variation for the outcome of CRBSI. The magnitude of the effects was also not affected by the participants' baseline risks.There were no significant differences between the impregnated and non-impregnated groups in the rates of adverse effects, including thrombosis/thrombophlebitis, bleeding, erythema and/or tenderness at the insertion site.

AUTHORS' CONCLUSIONS: This review confirms the effectiveness of antimicrobial CVCs in improving such outcomes as CRBSI and catheter colonization. However, the magnitude of benefits in catheter colonization varied according to the setting, with significant benefits only

in studies conducted in ICUs. Limited evidence suggests that antimicrobial CVCs do not appear to significantly reduce clinically diagnosed sepsis or mortality. Our findings call for caution in routinely recommending the use of antimicrobial-impregnated CVCs across all settings. Further randomized controlled trials assessing antimicrobial CVCs should include important clinical outcomes like the overall rates of sepsis and mortality.