

# Efficacy of Antiseptic-Impregnated Central Venous Catheters in Preventing Catheter-Related Bloodstream Infection

## A Meta-analysis

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CENTRAL VENOUS CATHETERS ARE commonly used for parenteral nutrition and fluid or drug administration in a variety of hospital settings. While providing convenient and beneficial venous access, these catheters also increase the risk of nosocomial bloodstream infection, contributing to the more than 200 000 cases that occur annually in the United States.<sup>1</sup> Catheter-related bloodstream infection (CRBSI) can be a serious complication, leading to increases in mortality, hospital stay, and medical costs.<sup>2</sup>

A variety of methods have been used to prevent catheter-related infections. Aseptic insertion techniques and proper catheter care have proved effective, while silver-coated catheter cuffs have produced mixed results.<sup>3</sup> Recently, the use of antibiotic-coated and antiseptic-impregnated cath-

**Context** Central venous catheters impregnated with chlorhexidine and silver sulfadiazine have recently been introduced for the prevention of catheter-related infections. However, there remains some uncertainty regarding the efficacy of these catheters because of conflicting reports in the literature.

**Objective** To evaluate the efficacy of chlorhexidine–silver sulfadiazine–impregnated central venous catheters in the prevention of catheter-related bloodstream infection.

**Data Sources** Studies identified from a computerized search of the MEDLINE database from January 1966 to January 1998, reference lists of identified articles, and queries of principal investigators and the catheter manufacturer.

**Study Selection** Randomized trials comparing chlorhexidine–silver sulfadiazine–impregnated central venous catheters with nonimpregnated catheters were included. The outcomes assessed were catheter colonization and catheter-related bloodstream infection confirmed by catheter culture.

**Data Extraction** Twelve studies met the inclusion criteria for catheter colonization and included a total of 2611 catheters. Eleven studies with a total of 2603 catheters met the inclusion criteria for catheter-related bloodstream infection. Most patients in these studies were from groups considered to be at high risk for catheter-related infections. Summary statistics were calculated using Mantel-Haenszel methods under a fixed-effects model.

**Data Synthesis** The summary odds ratio for catheter colonization was 0.44 (95% confidence interval [CI], 0.36-0.54;  $P < .001$ ), indicating a significant decrease in catheter colonization associated with impregnated catheters. The studies examining the outcome of primary interest, catheter-related bloodstream infection, had a summary odds ratio of 0.56 (95% CI, 0.37-0.84;  $P = .005$ ).

**Conclusions** Central venous catheters impregnated with a combination of chlorhexidine and silver sulfadiazine appear to be effective in reducing the incidence of both catheter colonization and catheter-related bloodstream infection in patients at high risk for catheter-related infections.