

## Medical News

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### Quantitative Assay Methods for Triple-Lumen Catheters

A major element for determining if a vascular catheter is infected is the performance of a quantitative microbiologic assay to show the presence of a significant number of microorganisms. The first method used was the semiquantitative roll-plate method described by Dennis Maki from the University of Wisconsin, Madison. Subsequently, there have been a number of methods described to perform quantitative assays of catheter tips or segments. A recent investigation compared a sonication method with the roll-plate method, and both of these methods to a flush technique for cultures of triple-lumen central catheters.

In a clinical trial, 248 triple-lumen catheters were removed from patients in an intensive-care unit, and their cultures of tips and subcutaneous segments were prepared by both the sonication and roll-plate methods; for 191 of these catheters, flush cultures of all three catheter lumens also were performed. Previously published quantitative endpoints were used to define significant catheter colonization. By using a composite index as a definition of colonization (any of the seven types of cultures meeting quantitative criteria), sonication of the subcutaneous segment was the most sensitive at detecting colonization (58%), followed by sonication of the catheter tip (53%). Sonication of both the subcutaneous and tip segments was 20% more sensitive than sonication of an adjacent catheter segment by the roll plate method. The greater sensitivity of the sonication method could be attributed to its greater ability than the roll-plate method to detect catheter lumen colonization (82% vs 57%, respectively). A greater number of positive catheter segment cultures were found for colonized catheters from patients with associated bacteremia than for colonized catheters from patients without bacteremia (57% vs 37%), making any culture method more likely to identify them. For catheters with significant colonization of only one site, the localization was 36.7%, subcutaneous segment; 36.7%, catheter lumen; and 26.6%, tip segment.

The authors concluded that the current practice of obtaining a culture from a single segment of a central vascular catheter is inadequate and needs to be reexamined. In addition, they suggest that initial colonization of the catheter lumen and tip segments may be more important than previously thought and may require a change in strategies designed to prevent catheter infection.

FROM: Sherertz RJ, Heard SO, Raad II. Diagnosis of triple-lumen catheter infection: comparison of roll plate, sonication, and flushing methodologies. *J Clin Microbiol* 1997;35:641-646.

### Nosocomial Bacteremia in Spain

Nosocomial bloodstream infections carry a high fatality rate and, together with ventilator-associated pneumonia, are the leading cause of deaths associated with nosocomial infections in intensive-care units (ICUs). Investigators in Barcelona, Spain, conducted an epidemiological analysis of bloodstream infections acquired in 30 multidisciplinary ICUs and over 16,000 patients in Spain to determine, by means of univariate and multivariate statistical techniques, the influence of a number of clinical, microbiological, and therapeutic variables on the outcome of a large series of critically ill patients with nosocomial bacteremia. A total of 590 consecutive episodes of nosocomial bacteremia were followed prospectively over a 9-month period.

The crude and directly related mortality rates were 42% and 19%, respectively. The predominant pathogens were coagulase-negative staphylococci (24%) and coagulase-positive staphylococci (18%). The most frequent sources of infection were intravenous catheters (37%). Multivariate analysis defined seven variables as independently influencing crude mortality: adult respiratory distress syndrome (ARDS), septic shock, multi-organ failure (MOF), mechanical ventilation, chronic hepatic failure, acute renal failure, and acute physiology, age, and chronic health evaluation (APACHE II) score of >15 at diagnoses. Variables associated with a higher directly related mortality were septic shock, ARDS, acute renal failure, MOF, gram-negative or *Candida* bacteremia, source of bacteremia other than intravascular catheter, and severe sepsis.

It was concluded that preventing catheter colonization is crucial in reducing the incidence of bacteremia in an ICU. However, equally, if not more, important is the better management of septic shock and associated complications in order to improve outcomes.

FROM: Valles J, Leon C, Alvarez-Lerma F. Nosocomial bacteremia in critically ill patients: a multicenter study evaluating epidemiology and prognosis. *Clin Infect Dis* 1997;24:387-395.

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*Additional news items in this issue: Nurses' Occupational Exposure to Blood, page 305; Hepatitis B and D Virus Infection—A Deadly Combination, page 321; Hepatitis G: Not Quite Another Step in the Alphabet, page 325; HCV in Tissue Culture: Yet Another Confounder, page 332; Vaccine Offers Promise for Rotavirus Diarrhea, page 339.*

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