Abstract:

PURPOSE: To prospectively evaluate outcomes associated with use of a triple-lumen (TL) peripherally inserted central catheter (PICC) in the intensive care unit (ICU) setting.

MATERIALS AND METHODS: Patients were prospectively enrolled in this HIPAA-compliant, institutional review board-approved study. Informed consent was obtained. All patients were in one hospital’s ICUs and needed intermediate-term central venous access requiring three lumina. A 6-F tapered TL PICC was placed by a bedside nursing-based team with backup from the Interventional Radiology department. Placement complications, as well as long-term complications, were recorded. At catheter removal, ultrasonography (US) of the veins containing the TL PICC was performed to detect occult venous thrombosis. Regardless of indication for removal, catheters were sent for culture to detect colonization.

RESULTS: The study was stopped prematurely after 50 of a planned 167 patients were enrolled when a scheduled interim analysis detected a venous thrombosis rate that was considered unacceptably high by the study oversight committee (thrombosis was symptomatic in 20% of patients [10 of 50]). Venous thrombosis (symptomatic or
asymptomatic) was detected in 26 of 45 patients (58%; 95% confidence interval: 43%, 72%) examined with US. Documented catheter-related bloodstream infection did not occur (0%; 95% CI: 0%, 7%); colonization was detected in three of 29 catheter tips sent for culture (10%; 95% CI: 2%, 27%). Catheter malfunction and dislodgment occurred in one patient each.

CONCLUSION: The TL PICC design used in this study resulted in unacceptably high venous thrombosis rates. Even when used in a high-risk setting for infection (ie, the ICU), rates of clinically evident infection and colonization were absent and low, respectively.