Reducing Central Venous Catheter-Related Bloodstream Infections in Children With Cancer

Brandi Horvath, BSN, RN, CPON®, Robbie Norville, MSN, RN, CPON®, Deborah Lee, BSN, RN, CPON®, Annie Hyde, BSN, RN, CPON®, MaryAnn Gregurich, PhD, MPH, and Marilyn Hockenberry, PhD, RN, PNP, FAAN

Children with cancer who have a central venous catheter (CVC) are at increased risk for bloodstream infections. Aseptic technique when using and caring for a CVC can decrease the chance of contamination in this patient population. Staff education on adherence to aseptic technique and strict CVC care guidelines are essential to decreasing bloodstream infections.

Background

Central Venous Catheters and Children With Cancer

CVCs are essential to the treatment and supportive care of children with cancer. The devices have greatly improved the quality of life of children with cancer and increased family satisfaction by minimizing the need for venipunctures and the associated emotional trauma. In addition, CVCs facilitate the long-term delivery of chemotherapy, parenteral fluids and nutrition, blood products, antimicrobials, and analgesics. However, the insertion and maintenance of CVCs are not without associated complications. Potential complications associated with catheter insertion include pneumothorax, air embolism, nerve injury, and catheter malposition. Infection and occlusion remain the two most common complications associated with use and maintenance of central lines (Bagnall-Reeb & Perry, 2002; O’Neill, 2005).

Incidence of Central Venous Catheter Infections

Catheter-related bloodstream infection rates vary widely among patient populations. Differences occur within the pediatric specialty and with catheter type. In the pediatric population, the National Nosocomial Infections Surveillance System (2004) reported that hospital pediatric intensive care units experience the highest rates of infection at 6.6 per 1,000 catheter days. The neonatal intensive care areas have slightly lower rates of catheter infections at 4.7 per 1,000 catheter days (Mahieu, De Dooy, Lenaerts, Ieven, & De Muynck, 2001). Infection rates for CVCs placed in children with cancer range from 1.0–4.58 per 1,000 catheter days (Hengartner, 2005).