Maintenance of Venous Access Devices in Patients With Neutropenia

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Neutropenia is a common complication in patients with cancer who are undergoing chemotherapy. Because of treatment frequency, potential chemotherapy damage to peripheral veins and tissues, and pain from multiple venipunctures, venous access devices (VADs) are often used in the oncology setting. Although VADs have been used for 30 years, no sufficient scientific data exist to support the best care and maintenance strategies for their use in patients with neutropenia. Understanding the etiology and pathogenesis of VAD-related infections (VAD-RI) and the proper steps to prevent or quickly treat it can decrease the likelihood that patients with neutropenia will have a fatal response. This article describes the differences between VADs, the most common sources of VAD-RI, and the treatment of such infections and suggests nursing interventions to help prevent VAD-RI.

Overview of Venous Access Devices

VADs have been used for more than three decades to administer IV medications, nutrition, and blood products and to draw blood specimens. Three types of long-term VADs are often used in oncology: tunneled catheters, peripherally inserted central catheters (PICCs), and implanted ports. Although each device has distinguishable differences, they can be used similarly. The majority of VADs are made of silicone polyurethane material, and a variety of internal and external diameters are available. All devices are available with single or double lumens, and tunneled catheters are available with three lumens. Each device is available with an open distal tip or with a three-way valve creating a closed distal tip.

Each VAD has characteristics that help to decrease the risk of infection. Most PICCs are inserted in the antecubital fossa of the arm and threaded through the cephalic or basilic veins. The risk of infection is decreased because fewer organisms live on the arm than on the chest and the area is far away from the nose and mouth. Therefore, the chance of introducing organisms into the bloodstream through the VAD is diminished (Pearson, 1996). Tunneled catheters have a cuff to secure the catheter in a subcutaneous tunnel away from the insertion site. Both tunneling and the cuff help to prevent the migration of microorganisms into the bloodstream.