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Management of Irritant Contact Dermatitis and Peripherally Inserted Central Catheters

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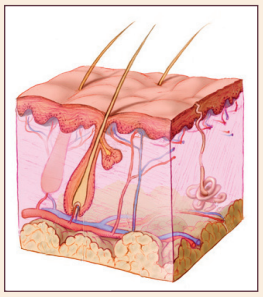

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Cutaneous skin changes are common in patients undergoing treatment for cancer. However, changes in central line care, maintenance practices, and chemotherapy protocols in the early 2000s may have led to the development of a common problem of irritant contact dermatitis (ICD) at peripherally inserted central catheter (PICC) insertion sites. Repeated exposure to chlorhexidine gluconate topical antiseptic solution, used in the general dressing care and maintenance with PICCs, may be the leading contributor to the development of ICD at the insertion site. A number of additional factors theoretically contribute to the development of ICD at the PICC insertion site in patients receiving chemotherapy. In this article, ICD will be defined, incidence and potential risk factors will be identified, and diagnostic framework will be explored; in addition, pathophysiology, onset, presentation, evaluation, and differential diagnosis of ICD at PICC sites will be analyzed. Finally, a synopsis of three different treatment approaches from healthcare facilities in Canada as well as implications for nursing practice and research will be presented.

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Central vascular access devices are essential tools in the delivery of chemotherapy to patients with cancer; however, they also are potential sources of infection for this immunocompromised population. A peripherally inserted central catheter (PICC) is a type of central vascular access device typically inserted into the basilic or cephalic veins of the upper arm above the antecubital fossa. In an effort to prevent and reduce central line–associated bloodstream infections (CLABSI), the Centers for Disease Control and Prevention (CDC) recommend a minimum concentration of 0.5% chlorhexidine gluconate (CHG) in an alcohol solution as the preferred topical antiseptic (prior to the insertion of central lines), for skin care during dressing changes, or when accessing implanted ports (O'Grady et al., 2011; Safer Healthcare Now!, 2009). In a meta-analysis by Chaiyakunapruk, Veenstra, Lipsky, and Saint (2002), the rate of catheter-related bloodstream infections (CRBSI) was reported to be lower (1%) in patients with catheter sites disinfected with CHG compared to a rate of 2% when povidone-iodine (polyvinylpyrrolidone iodine [PVP-I]) was used. Findings from the meta-analysis supported a reduction in CRBSI by 49% (risk ratio = 0.51, 95% confidence interval [0.27, 0.97]) when CHG versus PVP-I was used as a disinfectant for insertion site care. The current state of evidence on topical antiseptics has CHG designated as the skin antiseptic of choice since 2002 (O'Grady et al., 2011), with reported economic benefits in the prevention of CLABSI by reducing the costs associated with central line infections (Chaiyakunapruk, Veenstra, Lipsky, Sullivan, & Saint, 2003).

CHG, a water-soluble, cationic biguanide, topical antiseptic with broad-spectrum antimicrobial activity, has been in use since the 1950s (Denton, 2001; Milstone, Passaretti, & Perl, 2008). The antimicrobial mechanism of action for CHG varies by concentration (0.05%–4%), formulation (i.e., aqueous or alcohol solution), and pH (optimal at 5.5–7). At low concentrations, CHG exhibits bacteriostatic properties and binds to the negatively charged cytoplasmic membrane (inner cell wall) of bacteria, causing cell membrane disruption and leakage of cell components. Bactericidal properties of CHG are observed at higher concentrations, causing congealing and denaturation of the cytoplasm and, eventually, cell death (McDonnell & Russell, 1999; Milstone et al., 2008). CHG has a broad-spectrum of antimicrobial activity and mechanism of action against a number of aerobic and anaerobic gram-positive and gram-negative bacteria, some *Chlamydia trachomatis*, certain fungi, and