

## CONTINUING EDUCATION

# Evidence-Based Nursing Practice to Prevent Infection in Hospitalized Neutropenic Patients With Cancer

Elaine Larson, RN, PhD, FAAN, CIC, and Anita Nirenberg, RN, MS

**Purpose/Objectives:** To review studies that have assessed the effectiveness of selected nursing interventions used in hospitals to prevent healthcare-associated infections in neutropenic patients with cancer.

**Data Sources:** Literature review of low microbial diets, protective clothing and environments, personal hygiene, and oral care in English-language articles from PubMed; the *Cumulative Index of Nursing and Allied Health Literature*; the National Guideline Clearinghouse, 1980–June 2003; and Cochrane Database of Systematic Reviews.

**Data Synthesis:** Few studies have demonstrated the effectiveness of low microbial food and water and protective environments and clothing in reducing infections in neutropenic patients with cancer, and hospitals vary in these practices. Skin antisepsis reduces microbial counts, but data regarding the effect on infections are lacking. Many studies were characterized by insufficient sample sizes or use of multiple interventions.

**Conclusions:** Major gaps exist in empirical evidence regarding which nursing interventions might be helpful in preventing or controlling healthcare-associated infections in neutropenic patients.

**Implications for Nursing:** Although the evidence base for clinical practices such as a low microbial diet, protective environments and clothing, and special skin antisepsis regimens is weak, some of these practices seem prudent and reasonable. Until further evidence is available, clinicians can use consensus guidelines and should assist in identifying clinical practices that require additional research. Ultimately, interventions with little or no demonstrated efficacy should be examined systematically or abandoned. Additional studies of sufficient sample size regarding nursing practices such as the role of protective environments, room placement, antiseptic bathing, and prevention and treatment of oral complications are indicated. Because of difficulties in randomization and risk stratification, rigorous observational studies often may be an acceptable alternative to clinical trials.

Myelosuppressive chemotherapy for cancer represents a major advance in effecting remission and cure, but it is not free from risk. One of the serious adverse effects of chemotherapy is the development of neutropenia, which greatly increases the risk of infection when it is severe. The absolute neutrophil count (ANC) is the total white blood cell count multiplied by the combined percentage of segmented (mature) neutrophils and band cells. A normal ANC is greater than or equal to  $2\text{--}7 \times 10^9/\text{liters}$ . Neutropenia has an

### Key Points . . .

- Chemotherapy-induced neutropenia continues to be a problem for patients with cancer and their care providers.
- Few studies have been published that provide high-level evidence for preventing infections in neutropenic patients with cancer.
- More collaboration is needed among clinicians and researchers to identify and evaluate interventions to improve patient care.

### Goal for CE Enrollees:

To enhance nurses' knowledge about the current evidence on interventions designed to reduce the rate of infection in hospitalized patients with neutropenia.

### Objectives for CE Enrollees:

On completion of this CE, the participant will be able to

1. Describe the problem of infection in hospitalized patients with neutropenia.
2. Outline the current evidence about interventions designed to reduce the risk of infection in hospitalized patients with neutropenia.
3. Discuss areas of need for further research into the efficacy of interventions to reduce the risk of infection in patients with neutropenia.

Elaine Larson, RN, PhD, FAAN, CIC, is an associate dean of research and a professor of therapeutic and pharmaceutical research and Anita Nirenberg, RN, MS, is the director of the oncology program and assistant professor of clinical nursing, both in the School of Nursing at Columbia University in New York, NY. (Submitted April 2003. Accepted for publication September 15, 2003.)

Digital Object Identifier: 10.1188/04.ONF.717-725