

# Prevention of Infection

## A systematic review of evidence-based practice interventions for management in patients with cancer

Barbara J. Wilson, MS, RN, AOCN®, ACNS-BC, Laura J. Zitella, MS, RN, ACNP-BC, AOCN®, Colleen H. Erb, MSN, CRNP, ACNP-BC, AOCNP®, Jackie Foster, MPH, RN, OCN®, Mary Peterson, MS, APRN, ANP-BC, AOCNP®, and Sylvia K. Wood, DNP, APRN, ANP-BC, AOCNP®



**BACKGROUND:** Cancer-related infections lead to increases in mortality, antibiotic use, and hospital stays. Other adverse outcomes include dose delays and reductions, which can result in suboptimal treatment outcomes.

**OBJECTIVES:** Effective implementation of risk assessment and evidence-based interventions for the prevention and treatment of infection are essential to improve care and reduce costs related to infections in patients with cancer receiving immunosuppressive therapy.

**METHODS:** The Oncology Nursing Society (ONS) Putting Evidence Into Practice (PEP) prevention of infection resource have been developed and updated to identify and disseminate the best available scientific evidence.

**FINDINGS:** Pharmacologic and nonpharmacologic interventions were evaluated, resulting in recommended for practice rating for catheter care bundles, antimicrobial prophylaxis, vaccination for specific populations, and implementation of contact precautions for resistant organisms.

### KEYWORDS

cancer-related infection; evidence-based practice; prevention of infection; PEP

### DIGITAL OBJECT IDENTIFIER

10.1188/18.CJON.157-168

**CANCER-RELATED INFECTIONS CAUSE SIGNIFICANT COMPLICATIONS** in cancer care, affecting patient morbidity and mortality (Brand et al., 2016; Chindapasirt et al., 2013; Kuderer, Dale, Crawford, Cosler, & Lyman, 2006; Lyman et al., 2010). Patients with cancer are at risk for viral, bacterial, and fungal infections (National Comprehensive Cancer Network [NCCN], 2017b). Immunosuppression related to nature of the malignancy, chemotherapy, or targeted therapies increases infection risk (Gudiol, Aguado, & Carratalà, 2016; Ibrahim et al., 2013). Infections can cause dose delays and dose reductions that prevent optimal treatment outcomes (Bilir et al., 2016; Gafter-Gvili & Polliack, 2016; Lyman et al., 2010; Weycker et al., 2015).

A high infection risk is predictive of higher mortality rates, longer hospitalization, and higher cost of care (Wang, Lopez, & Chan, 2015; Weycker et al., 2015). Age older than 65 years is associated with a higher incidence of infections during treatment (American Cancer Society [ACS], 2016; Cooksley, Avritscher, Rolston, & Elting, 2009; Grosso et al., 2012; Zanussi, Serraino, Dolcetti, Berretta, & De Paoli, 2013), and 87% of people diagnosed with cancer in the United States are aged 50 years or older (ACS, 2017).

Patients with cancer have the potential for recurring infections requiring various antimicrobial treatment and prophylaxis. A systemic review evaluating trends in epidemiology and antibiotic resistance for bacteremia in these patients revealed that gram-negative bacteria was the most frequent isolate, with substantial emergence of antimicrobial-resistant strains in both gram-negative and gram-positive bacteria (Montassier, Batard, Gastinne, Potel, & de La Cochetière, 2013). Management of cancer-related infections related to multi-drug resistant organisms present challenges, including limited effective antibiotic choices, and are associated with higher risks for morbidity and mortality (Gudiol & Carratalà, 2014). Epidemiologic trends for emerging resistant strains of pathogens in patients with cancer can threaten antimicrobial resistance in the larger populations (Gudiol & Carratalà, 2014; Gudiol et al., 2016; Kalantar et al., 2015; Liu et al., 2016; Satlin et al., 2016). The economic burden from resistant pathogens is related to duration of illness, expensive antimicrobials, and additional diagnostics (Magauran & Salgado, 2011).