

# Prevention and Treatment of Bone Loss in Patients With Nonmetastatic Breast or Prostate Cancer Who Receive Hormonal Ablation Therapy

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Hormone ablation therapy is a mainstay in the treatment of breast and prostate cancers. However, aromatase inhibitors (AIs) used in postmenopausal women with breast cancer and androgen-deprivation therapy (ADT) used in men with prostate cancer contribute to substantial bone loss, thereby increasing the risk of osteoporotic fractures. Evidence-based guidelines, therefore, urge oncology practices to screen these patients for bone loss and, if needed, provide treatment to maintain bone health. In addition to lifestyle modification and calcium or vitamin D supplementation, bone protection strategies include treatment with bisphosphonates and denosumab, a monoclonal antibody against RANK ligand. Identification of patients at greater risk for bone loss and fracture and proper interventions can reduce fracture rates. Oncology nurses can play an important role in screening these patients. The purpose of this article is to inform oncology nurses about the effects of cancer treatment on bone health, review current prevention and treatment options for cancer treatment–induced bone loss, and discuss recommendations for identifying high-risk individuals.

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Key words: bisphosphonate; cancer treatment-induced bone loss; hormone ablation; bone mineral density; breast cancer; prostate cancer

Digital Object Identifier: 10.1188/14.CJON.223-230

**B**reast and prostate cancers are among the most common malignancies in the United States, with an estimated 232,670 women and 233,000 men, respectively, being diagnosed in 2014 (Siegel, Ma, Zou, & Jemal, 2014). Significant improvements in survival coupled with prolonged cancer therapy have heightened the need for long-term monitoring and prevention of treatment-related complications in these patients (Limburg, 2007). In particular, loss of bone mineral density (BMD) is an important complication of therapy associated with bone fractures (Maxwell & Viale, 2005). Cancer treatment–induced bone loss (CTIBL) can result from several treatment modalities that exert their antitumor effects by reducing circulating levels of estrogen, particularly hormone ablation therapies such as aromatase inhibitors (AIs) for breast cancer and androgen-deprivation therapies (ADTs) for prostate cancer (Hirbe, Morgan, Uluçkan, & Weilbaecher, 2006;

Maxwell & Viale, 2005). This article discusses the pathophysiology of CTIBL, the impact of CTIBL on patients with breast and prostate cancer, the risk factors for developing CTIBL, and currently available treatment options, with a focus on the implications of this information for oncology nurses.

## Physiology of Bone Remodeling

Physiologic bone remodeling reflects a balance between two complementary processes: bone mineral resorption by osteoclasts and bone mineral formation by osteoblasts. Pathologic conditions such as postmenopausal osteoporosis result from a loss of equilibrium between these two processes, with the rate of bone resorption exceeding bone mineral formation (Kearns, Khosla, & Kostenuik, 2008). Osteoblasts play an important role in regulating osteoclast function by releasing factors such as