

# Heart Failure and Long-Term Survival Among Older Women With Breast Cancer

Jordan M. Harrison, PhD, RN, Christopher R. Friese, PhD, RN, AOCN®, FAAN,  
Debra L. Barton, PhD, RN, AOCN®, FAAN, Nancy K. Janz, PhD, Susan J. Pressler, PhD, RN, FAAN, FAHA,  
and Matthew A. Davis, PhD, MPH

**OBJECTIVES:** To evaluate the association between heart failure and overall survival up to 10 years after breast cancer diagnosis.

**SAMPLE & SETTING:** Women aged 65 years or older diagnosed with invasive breast cancer, with and without self-reported heart failure, were examined for this retrospective cohort study using Surveillance, Epidemiology, and End Results cancer registries in the United States.

**METHODS & VARIABLES:** Cox proportional hazards regression was used to examine the association between heart failure status and mortality, adjusting for comorbidity and other clinical or sociodemographic differences. Associations were examined overall and stratified by cancer stage.

**RESULTS:** In adjusted models, having heart failure was associated with increased likelihood of death up to 10 years after cancer diagnosis. In adjusted subanalyses by cancer stage, heart failure was associated with increased likelihood of death up to 10 years after cancer diagnosis in women with stage I or II cancer but not in women with stage III/IV cancer.

**IMPLICATIONS FOR NURSING:** Although early-stage breast cancer is generally associated with better prognosis, the competing mortality risk of heart failure was greater for this group than for women with advanced cancer. Prevention and management of cardiovascular disease should be prioritized for this patient subgroup.

**KEYWORDS** breast cancer; heart failure; comorbidities; survivorship; late effects

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The co-occurrence of cancer and cardiovascular disease is a major public health issue that will become more prevalent as the population of older adults in the United States rapidly increases during the next several decades (Hung, Ross, Boockvar, & Siu, 2011, 2012; Smith, Smith, Hurria, Hortobagyi, & Buchholz, 2009). Women with breast cancer aged 65 years or older experience disproportionately high rates of heart failure. Increasing clinician concerns for patients with diagnoses of cancer and heart disease has catalyzed an emerging cross-disciplinary field of cardio-oncology (Moslehi, 2013, 2016). In a cohort study of more than 40,000 women diagnosed with breast cancer aged 66–70 years, the 10-year prevalence of heart failure ranged from 29% in women who received no chemotherapy to 38% in women treated with anthracyclines (Pinder, Duan, Goodwin, Hortobagyi, & Giordano, 2007). Comparatively, overall prevalence of heart failure in American women aged 60–79 years is 5% (Mozaffarian et al., 2016).

A growing body of evidence describes the complex interaction of factors that influence cardiovascular health in aging cancer survivors, including cancer treatment variables, lifestyle behaviors, and comorbid conditions (Leach, Bellizzi, Hurria, & Reeve, 2016; Leach et al., 2015; Patnaik, Byers, Diguiseppi, Denberg, & Dabelea, 2011). Multiple factors account for the high prevalence of heart failure in breast cancer survivors. Cardiovascular disease and breast cancer share many risk factors, including advanced age, obesity, and smoking (Lindenfeld & Kelly, 2010; Schmitz, Prosnitz, Schwartz, & Carver, 2012). The cardiotoxic effects of breast cancer therapies, including anthracyclines, mediastinal radiation, and biologic agents, such as trastuzumab, have been well documented (Lindenfeld & Kelly, 2010; Schmitz et al., 2012). Anthracycline chemotherapy, particularly doxorubicin, is known to cause cumulative,