

# The Association Between Hormone Receptor Status and End-of-Life Care Among Patients With Metastatic Breast Cancer

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**BACKGROUND:** In metastatic breast cancer (MBC), positive estrogen receptor (ER) and human epidermal growth factor receptor 2 (HER2) status allow for more long-term, sequential treatment options compared to ER-negative and HER2-negative diseases. It is unclear if end-of-life care (timely integration of palliative care, discontinuation of chemotherapy, and enrollment into hospice) in MBC is now tailored to the ER and HER2 status.

**OBJECTIVES:** This article explores the association between ER and HER2 status and the quality of end-of-life care received among patients with MBC.

**METHODS:** A 20-year MBC clinical database captured demographics, tumor characteristics, and treatment histories of deceased patients with MBC (N = 1,258) at a tertiary hospital located in Pittsburgh, Pennsylvania. Descriptive and inferential statistics were used.

**FINDINGS:** Patients with ER-positive MBC had greater odds of receiving quality end-of-life care than those with ER-negative MBC. HER2 status was not associated with differences in the quality of end-of-life care.

## KEYWORDS

metastatic breast cancer; hormone receptors; end-of-life care; palliative care

## DIGITAL OBJECT IDENTIFIER

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**ONE IN EIGHT U.S. WOMEN WILL DEVELOP INVASIVE BREAST CANCER** during the course of her lifetime (Howlader et al., 2019). Of those women, approximately 20%–40% will develop metastatic disease (Metastatic Breast Cancer Network, 2019). In the metastatic breast cancer (MBC) population, tumor subtypes—specifically estrogen receptor (ER) and human epidermal growth factor receptor 2 (HER2)—are predictive of treatment response and metastatic spread, and prognostic for life expectancy. The use of anti-estrogen hormone therapy has allowed for several sequential treatment options, including therapies directed at ER blockade, ER production, cyclin-dependent kinases 4 and 6 inhibition, and others (Silwal-Pandit et al., 2017). Patients with HER2-positive tumors undergo successful MBC treatment with several options for trastuzumab-based therapies. In addition to these therapies, chemotherapy may be offered in a sequential fashion. With all the available treatment options, discussions about end-of-life goals of care may be delayed, with a focus on treatment rather than the trajectory of illness (Brazee et al., 2021; Christakis, 2000; Glare et al., 2003).

In recent years, many new MBC clinical treatment agents have become available, extending life expectancy beyond two years (Caswell-Jin et al., 2018). Goals-of-care conversations are not consistently conducted and may occur only after several treatment options have already been exhausted.

Patients with ER-negative and HER2-negative status comprise approximately 15%–25% of all breast cancer cases (Bauer et al., 2007). Because of the inability of treatment focused specifically on unique cellular targets, these patients have fewer treatment options and a worse prognosis (American Cancer Society, 2020; Collignon et al., 2016).

Despite variance in subtype treatment options, one concern is that the standard of MBC care, including sequential treatment options for most patients with ER-positive and/or HER2-positive tumors, has created an expectation that there is always another treatment option for all tumor subtypes. This could create a tendency to delay conversations about end-of-life care for patients, including those with triple-negative diseases who have fewer treatment options and a shorter prognosis.

Indicators for poor-quality end-of-life care have been established in advanced cancer care (Earle et al., 2003, 2005). Some of these indicators include receiving any chemotherapy within 14 days of death, lack of palliative