

# Treatment-Induced Ovarian Insufficiency and Early Menopause in Breast Cancer Survivors

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Young women receiving systemic treatments for breast cancer are at risk for developing primary ovarian insufficiency and early menopause. Abrupt drops in estrogen levels often induce distressing vasomotor and vulvovaginal symptoms. Sustained estrogen deficiency related to treatment-induced early menopause can negatively affect long-term health outcomes. This article reviews the etiology of treatment-induced ovarian insufficiency and early menopause, discusses the effects of hypoestrogenism, and explores supportive care strategies to improve quality of life and long-term health for young breast cancer survivors.

## AT A GLANCE

- In premenopausal women, gonadotoxic chemotherapy agents and endocrine therapies can inhibit ovarian function and disrupt the physiologic effects of estrogen.
- Pharmacologic and nonpharmacologic management options are available for the sequelae of hypoestrogenism in this population.
- Nurses can support young breast cancer survivors by regularly assessing for menopausal symptoms, providing education and anticipatory guidance, and using an interprofessional approach to patient needs.

## KEYWORDS

breast cancer; early menopause; primary ovarian insufficiency; young adults

## DIGITAL OBJECT IDENTIFIER

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Breast cancer is one of the most common cancers among young adults in the United States (National Cancer Institute, 2020), with about 17% of all breast cancers diagnosed in women younger than the average age of menopause (51 years) (American Cancer Society, 2022; Kelly, 2020). In premenopausal women, breast cancer treatments often affect ovarian function and disrupt the physiologic effects of estrogen (American College of Obstetricians and Gynecologists [ACOG], 2017; O'Sullivan & Ruddy, 2016). Unlike the gradual reduction of estrogen levels that occurs with natural menopause, treatment-induced ovarian insufficiency leads to an abrupt drop in serum estrogen levels and more severe symptoms, which can negatively affect quality of life, treatment decision-making, and adherence (Franzoi et al., 2021; Runowicz et al., 2016; Sussman et al., 2019).

Young women with treatment-induced early menopause are at increased risk for several long-term health consequences of hypoestrogenism, including osteoporosis and cardiovascular disease (ACOG, 2017; North American Menopause Society, 2018; Panay et al., 2020; Runowicz et al., 2016). The purpose of this article is to review the etiology of treatment-induced ovarian insufficiency and early menopause in young breast cancer survivors (YBCS) and to explore supportive care strategies that oncology nurses can employ to manage common concerns related to estrogen deficiency.

## Etiology of Primary Ovarian Insufficiency and Early Menopause After Breast Cancer

Iatrogenic primary ovarian insufficiency (POI) and subsequent hypoestrogenism may occur by multiple mechanisms in YBCS. For example, endocrine therapy includes the inhibition of estrogen production or the manipulation of estrogenic action at target tissues (Isaacs, 2022). A sustained hypoestrogenic state can be attained with gonadotropin-releasing hormone agonists, which affect the hypothalamic-pituitary-gonadal axis to halt ovarian production of estrogen, and aromatase inhibitors, which block the conversion of androgens to estrogen in peripheral tissues. Although gonadotropin-releasing hormone agonists may play a role in protecting ovarian function during chemotherapy (Lambertini et al., 2018; National Comprehensive Cancer Network [NCCN], 2022a; Panay et al., 2020), the