

# Chemotherapy-Induced Cognitive Impairment in Women With Breast Cancer: A Critique of the Literature

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**Purpose/Objectives:** To review and critique the studies that have investigated chemotherapy-induced impairments in cognitive function in women with breast cancer.

**Data Sources:** Published research articles and textbooks.

**Data Synthesis:** Although studies of breast cancer survivors have found chemotherapy-induced impairments in multiple domains of cognitive function, they are beset with conceptual and methodologic problems. Findings regarding cognitive deficits in women with breast cancer who currently are receiving chemotherapy are even less clear.

**Conclusions:** Although data from published studies suggest that chemotherapy-induced impairments in cognitive function do occur in some women with breast cancer, differences in time since treatment, chemotherapy regimen, menopausal status, and neuropsychological tests used limit comparisons among the various studies. Further studies need to be done before definitive conclusions can be made.

**Implications for Nursing:** The potential for chemotherapy-induced impairments in cognitive function may influence patients' ability to give informed consent, identify treatment toxicities, learn self-care measures, and perform self-care behaviors.

## Key Points . . .

- Cognitive function is a multidimensional concept that describes the domains resulting from healthy brain performance, namely attention and concentration, executive function, information processing speed, language, visuospatial skill, psychomotor ability, learning, and memory.
- Studies that evaluated chemotherapy-induced impairments in cognitive function in women with breast cancer provide some early insights into the specific cognitive domains that are affected by chemotherapy.
- Further investigation is needed to identify the tests that are the most valid, reliable, sensitive, and specific for detecting short-term and persistent chemotherapy-induced cognitive impairments.

Breast cancer is the most common type of malignancy and the second leading cause of cancer deaths in women in the United States (Jemal et al., 2005). Advances in breast cancer treatment have increased survival, with a relative five-year survival rate of 98% for early-stage disease (Jemal et al.). The treatment of breast cancer is multimodal and includes some combination of surgery, radiation therapy (RT), chemotherapy, hormonal therapy, or biologic therapy. Each treatment modality has its own distinct side effects, with accompanying degrees of disruption in quality of life (QOL).

Although great strides have been made in eliminating (or at least decreasing) the side effects of chemotherapy, studies consistently confirm that toxicities (e.g., fatigue, infection, nausea, vomiting, diarrhea, stomatitis, alopecia, neuropathy) continue to adversely affect QOL (Cowley, Heyman, Stanton, & Milner, 2000; Fairclough, Fetting, Cella, Wonson, & Moinpour, 1999; Ganz, 2000). A toxicity that has emerged recently is impairment in cognitive function. Patients with cancer have reported increased difficulties with their abilities to remember, think, and concentrate (Bender, Paraska, Sereika, Ryan, & Berga, 2001; Brezden, Phillips, Abdoell, Bunston, & Tan-nock, 2000; Cole, Scialla, & Bednarz, 2000; Cull et al., 1996;

Ganz, 1998). However, whereas cognitive impairments in children who received cranial RT or chemotherapy have been documented (Copeland et al., 1985; Copeland, Moore, Francis, Jaffe, & Culbert, 1996; Kun, Mulhern, & Crisco, 1983; Marina, 1997; Moore, Kramer, & Ablin, 1986), comparable evidence is lacking in adults.

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