

# Cognitive Impairment After Breast Cancer Treatment

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Cognitive impairment after chemotherapy is a reported concern of some breast cancer survivors (Ahles & Saykin, 2001). Despite a growing body of research, cognitive impairment remains a poorly understood issue that tends to manifest as a change in memory, learning, language, multitasking, and concentration after receiving treatment for cancer. Research has found that some, but not all, women treated with chemotherapy for breast cancer experience cognitive declines when evaluated through neuropsychologic testing. The incidence of cognitive impairment after chemotherapy for breast cancer is broad. Some studies document as little as 17% (Schagen et al., 1999) and as many as 75% (Weineke & Dienst, 1995) scoring below normal levels on neuropsychologic testing. Some studies have examined cognitive function in women prior to and after chemotherapy. The results of a study by Wefel, Lenzi, Theriault, Davis, and Meyers (2004) found that 33% of women tested in the impaired range prior to chemotherapy. Other studies have reported that standard neuropsychologic testing reveals no impairment even if participants report impairment after chemotherapy (Ahles et al., 2002; Schagen et al.).

The exact mechanism of how cognitive impairment occurs in women treated with chemotherapy for breast cancer is unclear. Although “chemo brain” is a commonly used term, other factors aside from chemotherapy have been found to have an effect on cognitive function, including endogenous hormones, genetic predisposition, depression, anxiety, fatigue, cytokines, cancer treatment, and clotting in small blood vessels (Tannock, Ahles, Ganz, & van Dam, 2004). As men-

tioned previously, some women report cognitive impairment but test within the normal range on neuropsychologic tests. Relationships between self report of cognitive impairment in the face of normal neuropsychological measures have been associated with depression (Bender et al., 2006; Castellon et al., 2004; Schagen et al., 1999), anxiety (Castellon et al.; Schagen et al.), fatigue (Castellon et al.; Downie, Mar Fan, Houede-Tchen, Yi, & Tannock, 2006), menopausal symptoms (Downie et al.), distress (Schagen et al.; Shilling & Jenkins, 2007), and self-report of poor quality of life (Shilling & Jenkins).

## Therapeutic Interventions

Many studies have evaluated the presence of cognitive impairment in survivors of breast cancer, but few evidence-based studies have focused on interventions. Two abstracts reported at the American Society of Clinical Oncology annual meetings reported improvement in cognitive function for women who were treated with chemotherapy when they were given dexamethylphenidate (Lower et al., 2005) and modafinil (Kohli, Fisher, Tra, Wesnes, & Morrow, 2007). Dexamethylphenidate and modafinil are not yet indicated for the treatment of cognitive impairment after chemotherapy by the U.S. Food and Drug Administration (FDA).

Cognitive behavioral therapy (CBT) was found to be helpful for survivors of breast cancer who reported cognitive

impairment after chemotherapy (Ferguson et al., 2007). Ferguson et al. reported that a specialized intervention using CBT principles called memory and attention adaption training was delivered to 29 survivors of breast cancer. Participants were highly satisfied with the intervention, reported improvement in cognitive function, and showed improved performance on neuropsychologic tests.

Few studies have examined the experience of cognitive impairment and how it affects day-to-day life. Mulrooney (2007) interviewed 10 survivors of breast cancer who reported cognitive impairment after chemotherapy. The women who reported the most disruption from cognitive impairment were those with high-stress occupations, such as professors or administrators, and were trying to juggle work and family responsibilities (Mulrooney). Coping strategies and practical tips on managing day-to-day life challenges have been provided by the breast cancer survivors in Mulrooney's study and can be found in Figure 1.

## Case Study

L.S., a 48-year-old married mother of three, was diagnosed with stage II breast cancer. The tumor was 2.3 cm, positive for estrogen and progesterone receptors, and HER2/neu negative; she had two positive lymph nodes. L.S. underwent a lumpectomy and received six cycles of 5-fluorouracil, epirubicin, and cyclophosphamide (FEC). She then received

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Digital Object Identifier: 10.1188/08.CJON.678-680