Breast cancer is the most common malignancy and the second leading cause of cancer-related death in women in the United States (Jemal et al., 2003). Twenty-five percent of women with breast cancer are premenopausal at the time of diagnosis (Danforth, 1991). Adjuvant chemotherapy has significantly improved the cure rate in premenopausal women with early-stage breast cancer; however, chemotherapy for breast cancer has been associated with deficits in cognitive function (Brezen, Phillips, Abdolell, Bunston, & Tannock, 2000; Paganini-Hill & Clark, 2000; Schagen et al., 1999; van Dam et al., 1998). These deficits may persist for years after the completion of treatment (Berglund, Bolund, Fornander, Rutqvist, & Sjoden, 1991; Cimprich, 1992; Paganini-Hill & Clark; Schagen et al.; van Dam et al.; Wienieke & Dienst, 1995).

Cognitive dysfunction occurs in 17%–50% of women who receive chemotherapy for breast cancer (Brezen et al.; van Dam et al.) and may include decrements in verbal and visual memory, mental flexibility, psychomotor efficiency, attention and concentration, and visuospatial ability (Bender, Paraska, Sereika, Ryan, & Berga, 2001).

One mechanism that may contribute to cognitive dysfunction in women who receive chemotherapy for breast cancer involves changes in reproductive hormone levels and consequent change in reproductive status (Bender et al., 2001). Adjuvant chemotherapy results in loss of estrogen and progesterone and ovarian failure in 77% of women who are premenopausal at the time of a breast cancer diagnosis (Bines, Oleske, & Cobleigh, 1996; Mehta, Beattie, & Das Gupta, 1992). Reductions in estrogen and progesterone levels are associated with deficits in learning, memory, attention, and psychomotor efficiency in healthy women who experience natural or surgical menopause (Farrag, Khedr, Abdel-Aleem, & Rageh, 2002; Phillips & Sherwin, 1992; Sherwin, 1996). Improvement in these dimensions of cognitive function occurs with hormone replacement therapy (Grodstein et al., 2000; Henderson, Paganini-Hill, Emanuel, Dunn, & Buckwalter, 1994; Resnick & Maki, 2001; Robinson, Friedman, Marcus, Tinklenberg, & Yesavage, 1994; Sherwin & Gelfand, 1985). However, no studies have examined the extent to which chemotherapy influences the relationship between cognitive function and reproductive hormone status in premenopausal women with breast cancer. Additionally, although not all women with breast cancer experience depression during the course of treatment, the presence of depression may be a confounding factor in the experience of cognitive dysfunction in this population (Cohen, Weingartner, Smallberg, Pickar, & Murphy, 1982; Weingartner & Silberman, 1982).