

# Relative Dose Intensity—Improving Treatment and Outcomes in Early-Stage Breast Cancer: A Retrospective Study

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**B**reast cancer is the second most diagnosed cancer in women after skin cancer, with an estimated 226,870 new cases of invasive breast cancer diagnosed in 2012 in the United States (American Cancer Society [ACS], 2012). Death rates for breast cancer have steadily decreased in women since 1991, when 45,583 deaths occurred compared to the estimated 39,920 deaths in 2012, and with larger decreases noted in women younger than age 50 (a decrease of 3.1% per year) compared to those aged 50 years or older (2.1% per year) (ACS, 2012). The decrease in breast cancer deaths reflects progress in early detection and improved treatment. In addition, the five-year relative survival rate has improved from 63% in the 1960s to 90% in 2012 (ACS, 2012).

Researchers have determined that adjuvant systemic chemotherapy improves patient outcomes. Efficacy of adjuvant chemotherapy for breast cancer has been analyzed in 20-year (Bonadonna, Valagussa, Moliterni, Zambetti, & Brambilla, 1995) and 30-year (Bonadonna et al., 2005) follow-up studies comparing treatment outcomes with surgery alone. The 20-year follow-up of early-stage breast cancer (ESBC)—defined as stages I, II, or III—revealed that patients who were receiving adjuvant chemotherapy with cyclophosphamide, methotrexate, and fluorouracil (CMF) after mastectomy showed significant overall survival, supporting the use of early chemotherapy after mastectomy versus surgery alone for patients at high risk for micrometastasis (Bonadonna et al., 1995). These results confirm that chemotherapy plays a major role in primary management of breast cancer. Additional analysis in the 30-year follow-up (Bonadonna et al., 2005) measuring relapse-free and overall survival by univariate and multivariate

**Purpose/Objectives:** To determine the amount of chemotherapy delivered compared to amount of chemotherapy scheduled by calculating relative dose intensity (RDI) and to identify factors associated with nonadherence of scheduled treatment regimens for patients with early-stage breast cancer (ESBC).

**Design:** Retrospective, descriptive, correlational study.

**Setting:** Two community hospital cancer centers in northern Michigan.

**Sample:** 77 patients with ESBC receiving adjuvant chemotherapy.

**Methods:** The RDI Calculator™ was used for data collection. A worksheet was developed for each patient and included characteristics, treatment information, and RDI calculations. SAS®, version 19.2, was used for multivariate analyses based on logistical regression analyzing relationships among dependent and independent variables.

**Main Research Variables:** Dependent variables were RDI prescribed and RDI received. Independent variables included chemotherapy regimen, clinical characteristics, planned dose, and schedule.

**Findings:** The average RDI was 86.6%. The average RDI was 86.7% for patients younger than age 65, and 85.5% for those 65 and older. The most common reasons for dose reduction or dose delay were treatment toxicity, chronic disease risk factors, age, unplanned versus planned treatment dose, institution (different standards of care), patient preference, and weight.

**Conclusions:** Meeting treatment goals of RDI for patients with ESBC has been shown to increase the disease-free survival rate and positively affects overall survival.

**Implications for Nursing:** Nurses have the unique opportunity to case manage patients with ESBC throughout the spectrum of care. One of the key areas of focus is education of the patient and her family members from the time of diagnosis throughout treatment and rehabilitation.