Breast cancer is the most commonly diagnosed cancer in women in the United States; in 2003, an estimated 211,300 new cases will be diagnosed (Jemal et al., 2003). Early-stage breast cancer (i.e., stage I or II) is treated with lumpectomy followed by breast irradiation (i.e., breast-conserving therapy) or mastectomy. Large randomized clinical trials have shown that mastectomy is an equivalent treatment option to lumpectomy and radiation therapy (Arriagada, Le, Rochard, & Contesso, 1996; Fisher et al., 2002; Jacobson et al., 1995; van Dongen et al., 2000; Veronesi et al., 2002). Patients also undergo a sentinel lymph node biopsy (SLNB) and/or an axillary lymph node dissection (ALND) to determine the extent of the disease.

Adjuvant systemic treatment may be indicated if patients have unfavorable pathologic features (e.g., a tumor larger than 1 cm, lymphovascular invasion, lymph node involvement, high nuclear grade and/or histologic grade, Her2-neu overexpression, hormone receptor negative status). Systemic therapy may include chemotherapy and/or hormonal therapy. Patients who are estrogen and/or progesterone receptor positive may be considered for adjuvant hormonal therapy initiated during or after the completion of radiation therapy (National Comprehensive Cancer Network, 2002).

Breast cancer is the most commonly diagnosed cancer among women in the United States. Approximately half of all patients diagnosed with early-stage breast cancer receive conservative breast surgery followed by consolidative radiation treatment. A number of technologic advances have been made in radiation therapy planning and treatment that minimize early and late toxicities and may improve treatment outcomes. Among these are (a) the treatment of patients with large or pendulous breasts or cardiopulmonary disease in the prone position, (b) intensity-modulated radiation treatment, which delivers precise, highly conformal radiation dose distributions within the breast by using computerized inverse treatment planning and intensity-modulated radiation beams to produce the required dose distribution, and (c) brachytherapy, which is the placement of a radioactive source within the lumpectomy bed. These advances are gaining national recognition and are available at many institutions. Nurses play a vital role in educating patients; therefore, nurses must have the information they need to inform their patients about these advances. The information in this article will allow nurses to help patients understand the anticipated treatment and related side effects and make informed decisions.

**Key Words:** breast neoplasms, radiotherapy; brachytherapy

### Radiation Therapy

Patients undergoing breast-conserving therapy receive radiation after lumpectomy with the goal of eradicating residual microscopic cancer cells to minimize locoregional recurrence (Lichter, 1998). Careful planning before the start of radiation ensures correct dose distribution of radiation to the target area and minimal exposure to surrounding normal structures (i.e., heart, lung, ribs). In patients who do not require adjuvant chemotherapy, radiation therapy typically begins three to four weeks after surgery. This allows for adequate healing of the lumpectomy incision site. On occasion, wound dehiscence, maceration, postoperative infection, or hematoma formation may delay the initiation of radiation. Otherwise, radiation is started one month after the last cycle of chemotherapy.

Traditionally, a patient is treated in a supine position with the arm on the affected side elevated above the head to ensure that the arm is out of the treatment field. An immobilization device is made to ensure reproducibility of the treatment position each day (see Figure 1). Radiation is administered to the entire breast using photon beams aimed in opposing tangential fields. The breast is irradiated with a dose of 180–200 cGy, Monday through Friday, 629–636 cGy, Tuesday through Friday. A boost (e.g., a tumor larger than 1 cm, lymphovascular invasion, lymph node involvement, high nuclear grade and/or histologic grade, Her2-neu overexpression, hormone receptor negative status). Systemic therapy may include chemotherapy and/or hormonal therapy. Patients who are estrogen and/or progesterone receptor positive may be considered for adjuvant hormonal therapy initiated during or after the completion of radiation therapy (National Comprehensive Cancer Network, 2002).

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