Maximizing Exercise in Breast Cancer Survivors

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Regular physical exercise can maximize physical, mental, and social well-being during and after treatment in breast cancer survivors. An exercise program following cancer therapy is facilitated by instilling a positive attitude toward exercise, confidence in conquering barriers, and a supportive social environment. The purpose of this article is to describe the benefits of moderate exercise in breast cancer survivors and propose a comprehensive approach for the cancer care team in maximizing survivor efforts to improve their physical strength and endurance after completion of adjuvant therapy for breast cancer (surgery, chemotherapy, and/or radiation). A moderate exercise program can help most survivors become more physically and mentally fit and energetic. Understanding factors that prompt the initiation of healthy lifestyle choices among breast cancer survivors is critical to encouraging an attitude of healthy living.

Breast cancer remains the most common cancer diagnosis among women in the United States, with approximately 192,370 diagnosed annually and 40,170 women estimated to die of breast cancer in 2009 (American Cancer Society [ACS], 2009a). The lifetime risk of developing breast cancer is one in eight, and the disease risk increases significantly with age. Ninety-five percent of breast cancer cases are diagnosed in women older than age 40 years. The age-adjusted mortality rates since the late 1990s have decreased with early detection and improved treatments. The five-year relative survival for breast cancer is approximately 85%, indicating most women will survive many years after initial diagnosis and treatment. Given the statistics, nurses need to recognize the benefits of exercise for women with breast cancer and promote the established guidelines and precautions from ASC or the American College of Sports Medicine (ACSM) for exercise after breast cancer therapy (Courneya, Mackey, & McKenzie, 2002; Doyle et al., 2006). Cancer care teams should keep in mind these are only guidelines, in which a specialized physical activity prescription can be developed.

A literature review of post-cancer exercise published by Physician and Sports Medicine included studies examining aerobic and resistance training designed to improve cardiovascular function and muscular strength (Courneya et al., 2002). The review cited 20 studies, 8 of which examined exercise after breast cancer treatment. Depending on the study, some participants started the exercise program immediately after completing breast cancer therapy and others were almost four years after therapy. The studies presented evidence that exercise benefits a wide variety of biopsychosocial factors. Factors include cardiovascular fitness, body composition, self-esteem, mood states, and fatigue during and after breast cancer treatments. Ninety percent of the 20 studies supported beneficial changes in at least one biopsychosocial outcome. Even during adjuvant therapy, breast cancer survivors can adhere to a moderate exercise prescription. Special precautions may be necessary after chemotherapy in relation to altered blood counts or other physical conditions accompanying treatment. Determining the optimal exercise prescription for breast cancer survivors in the future is essential (Courneya et al.).

Hsieh et al. (2008) recently reported the effects of a supervised exercise intervention study on recovery from treatment regimens in breast cancer survivors. The results showed moderate intensity and individualized, prescriptive exercise maintains or enhances cardiopulmonary function with simultaneous reductions in fatigue despite treatment type. The authors concluded that symptom}

At a Glance

- Current research supports the psychological and physiologic benefits of exercise for breast cancer survivors.
- Nurses can incorporate exercise after treatment for breast cancer survivors in the cancer care plan by instilling a positive attitude toward exercise, confidence in overcoming barriers, and a supportive social environment.
- Oncology nurses are critical in maximizing an interdisciplinary, individualized exercise plan in breast cancer survivors.
management recommendations should be given to cancer survivors regarding the effectiveness of exercise throughout the cancer process and the significance of participating in a cancer rehabilitation exercise program.

**Obesity and Other Risks**

Although breast cancer survival is improving, survivors face physical and psychological challenges related to diagnosis and treatment, which influence long-term prognosis. Unfortunately, obesity is a global problem. Up to 60% of women diagnosed with breast cancer experience weight gain related to chemotherapy, treatment-related menopause, and decreased physical activity (Saxton et al., 2006). Body mass index (BMI), commonly used in health care, is calculated using the formula: weight [kg]/height [m²]. BMI for a healthy weight is lower than 25, overweight is 25–29.9, and obesity is 30 or higher (National Heart Lung and Blood Institute, n.d.). Almost 60% of women in the United States are overweight and approximately 33% are obese. Evidence exists that women with a BMI of at least 40 have a 62% greater risk of death from all cancers compared to women with a healthy weight (Calle, Rodriguez, Walker-Thurmond, & Thun, 2005). Increasing death rates have been observed between breast cancer and high BMI (Calle et al.; Kroenke, Chen, Rosner, & Holmes, 2005).

Reduced survival in overweight or obese patients may be related to higher concentrations of tumor-promoting hormones, consequent to increased adipose tissue. Higher levels of estrogen and testosterone have been found in overweight postmenopausal patients with breast cancer when compared to women with a healthy weight (McTiernan, Rajan, et al., 2003). Research shows that elevated estrogen levels influence the risk of breast cancer in postmenopausal women (Berstein, 2005; Chebowski, Aiello, & McTiernan, 2002; Thomas, Reeves, & Key, 1997).

In addition to weight changes, breast cancer survivors frequently endure many other negative physical and psychological consequences as a result of necessary treatment. Many women with early-stage breast cancer undergo surgical removal of breast tumors and axillary lymph nodes. Woman may undergo adjuvant therapies such as radiation, chemotherapy, and hormonal therapy. Cancer survivors may experience symptoms of depression, anxiety, stress, poor body image, low self-esteem, loneliness, and loss of sense of control (Spiegel, 1997). Examples of physical and functional components may be asthenia, ataxia, reduced cardiovascular function, muscle weakness and atrophy, insomnia, fatigue, and nausea and vomiting. Breast cancer survivors may encounter additional unique barriers such as decreased arm range of motion, lymphedema, impaired cognitive dysfunction, weight gain, and osteoporosis. Combined comorbidities can alter women’s quality of life (Courneya et al., 2002). Exercise has been shown to have a therapeutic role in promoting potential reversal and improvement in morbidities associated with breast cancer treatment.

**A Prescription to Exercise**

The ACSM guidelines of three to five days per week of an aerobic activity that can be maintained consistently for 20–60 minutes at a moderate intensity (60%–80% maximal heart rate) have been successfully applied to post-breast cancer therapy (Courneya et al., 2002). Exercise is known to play a role in preventing some cancers and recurrences (McTiernan, Kooperberg, et al., 2005). The impact of physical activity in decreasing the risk of breast cancer recurrence continues to be studied. The ACS (2009b) cancer prevention guidelines on physical activity recommend that women participate in moderate to vigorous physical activity for 45–60 minutes on five or more days per week. Moderate activity is comparable to the effort expended during a brisk walk. Vigorous activities use large muscles, cause perspiration, and trigger a measurable increase in pulse and respirations. A resource from ACS (2009b) titled “What Happens After Treatment for Breast Cancer?” includes an informative section on survivor follow-up and physical activities.

The Nurses’ Health Study illustrated that modest activity of walking 30 or more minutes a day for five to seven days a week can improve survival in stage I–III patients with breast cancer (Holmes, Chen, Feskanich, Kroenke, & Colditz, 2005). Lifetime weight gain should be reduced by limiting calories and pursuing regular physical activity. Intake of alcoholic beverages should be avoided or limited. For those who are inactive or just beginning a physical program, a gradual increase to the recommended level will provide substantial cardiovascular benefits (Kushi et al., 2006). The ACS Expert Committee’s grading of evidence for benefit versus harm for breast cancer survivors shows the benefits of working toward a healthy weight and of exercising were greater after treatment than during treatment (Brown et al., 2003). Whether exercise has an impact on cancer treatment completion rates or on the efficacy of cancer treatment is undetermined (Doyle et al., 2006). An animal study showed that exercise did not impede the efficacy of chemotherapy (Jones et al., 2005).

Exercise and resistance training as an intervention for cancer recovery has been studied extensively and has demonstrated a therapeutic benefit for cancer survivors (Courneya et al., 2002). Weight training improves body composition and strength in

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<td>Cues to action (media campaigns, healthcare provider recommendations, lay advice, and educational pamphlets) stimulate an individual’s threat of the disease by influencing perceived seriousness, susceptibility, or both.</td>
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**Figure 1. Health Belief Model**

*Note. Based on information from Breslow, 2006.*
breast cancer survivors and, therefore, should be included in the routine (Kushi et al., 2006; Ohira, Schmitz, Ahmed, & Yee, 2006). Currently, only 14% of women aged 45–65 years in the general population participate in strengthening activities (U.S. Department of Health and Human Services, 2000).

A cancer diagnosis can change a survivor’s attitude toward lifestyle and health behavior (Rabin & Pinto, 2005). Sixty-five breast cancer survivors were surveyed on sedentary habits, alcohol consumption, and dietary habits within three months after completing their cancer treatment and again three months later. Survivors who believed that unhealthy diet, inadequate exercise, or alcohol use contributed to their cancer were more prone to modify the relevant behavior. Therefore, healthy lifestyle changes after a personal cancer diagnosis seem to be tied to whether individuals believe lifestyle changes can affect cancer outcomes. Knowing the factors that prompt the initiation of healthy lifestyle choices among breast cancer survivors is a crucial first step toward developing interventions for those unlikely to initiate such behavior changes on their own (Rabin & Pinto).

Cancer survivors are at risk for becoming more sedentary for several reasons. First, physical activity levels often decrease after the diagnosis of cancer. Most continue lower levels of activity through treatment and after, seldom returning to their pretreatment levels of activity. Secondly, treatment-related adverse effects on the cardiopulmonary, neurologic, and muscular systems may diminish the capacity to exercise. Finally, being sedentary is a risk factor for breast cancer; therefore, a diagnosis of breast cancer may reinforce longstanding poor health habits. Cancer survivors are challenged with a reduced level of fitness, endurance, and strength as well as the physical and psychological stresses of a cancer diagnosis, treatment, and recovery. All of these factors into developing a successful exercise program for breast cancer survivors. What may be of low-to-moderate intensity for a fit person may be of high intensity for cancer survivors (Brown et al., 2003).

Many breast cancer survivors are at risk for comorbid conditions. An increase in physical activity can help reduce morbidities. For instance, women who experience menopause (often prematurely as a result of breast cancer treatment) are at higher risk for osteoporosis and would benefit from resistance training to increase bone strength. Resistance exercise has been reported to improve bone density. Other helpful outcomes of exercise can include improved lean body mass and muscle, with resulting decreased risk for falls and fractures (Brown et al., 2003).

The efficacy of healthy exercise following breast cancer diagnosis and treatment will depend on the motivation and adherence of survivors. Ongoing adherence to a fitness program is difficult for healthy people and is likely more challenging after breast cancer. Evidence reveals that although most breast cancer survivors reduce fitness levels during treatment, they can form a very motivated group. Denmark-Wahnefried, Bercedis, McBride, Lipkus, and Clipp (2000) found high receptivity in cancer survivors for health promotion programs soon after diagnosis. Understanding the determinants of exercise adherence can help professionals promote exercise for post-cancer therapy. In a summary of studies of patients with cancer, reasons for attrition included changes in health status, issues related to the research protocol, personal challenges, issues related to the exercise intervention, and loss to follow up (Hacker, 2009).

**Health Education**

The Health Belief Model (Rosenstock, 1974; Rosenstock, Strecher, & Becker, 1988) is one theoretical model that can be used to understand exercise in breast cancer survivors (see Figure 1). The proposed health education is based on elements of the Health Belief Model to encourage physical fitness for breast cancer survivors after completing therapy. Following the diagnosis of a life-threatening disease, the survivor may no longer feel safe. Women's health-related behaviors depend on women's susceptibility to the illness, the perceived benefits for taking action, and barriers to taking action. Certain cues with a personal relevance stimulate a woman to take action toward maintaining programs of fitness. To account for habitual behaviors such as physical fitness, the construct of self-efficacy or a woman’s confidence in her ability to successfully perform an intervention is part of the model (Green, 2006). The cancer care team must promote healthy education and provide incentive for the survivor to take action by encouraging women to adopt a program. The program will be beneficial by enhancing feelings of competency to take action.

Participants should receive written and verbal education on the risks of unhealthy diet and unhealthy weight, inadequate exercise, and comorbid conditions. Educational literature will stress healthy behaviors and physical rehabilitation to provide the best chance for physical and psychological wellness. The educational program should include tips for overcoming potential barriers to physical activities. Information must cover social environments such as

**Figure 2. Therapeutic Care Plan and Interventions**

*Note.* Based on information from Cricket Rose & Keegan, 2005.

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\begin{itemize}
  \item Take at least 10 minutes for stretching and warm-up.
  \item Stop if you become fatigued.
  \item Stop if you are experiencing pain.
  \item Stop if you experience dizziness or nausea.
  \item Monitor your pulse regularly.
  \item A cooldown is as important as a warm-up; take 10 minutes to stretch and cooldown.
\end{itemize}
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**Figure 3. Recommendations for Increasing Physical Activity**


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\begin{itemize}
  \item Use stairs rather than an elevator.
  \item If you can, walk or bike to your destination.
  \item Exercise with your family, friends, and coworkers.
  \item Take an exercise break to stretch or take a short walk.
  \item Walk to visit nearby friends or coworkers instead of sending an e-mail.
  \item Plan active vacations rather than only driving trips.
  \item Wear a pedometer every day and increase your daily steps.
  \item Use a stationary bicycle or treadmill while watching TV.
\end{itemize}
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work, family, and friends, all of which can significantly influence activity. Community obstacles such as lack of accessibility to parks, trails, and recreational facilities can play a role in discouraging women's level of activity. Personal barriers, including psychological, behavioral, and psychological factors, may affect plans to become more active. Some of the most common reasons cited for inadequate activity are limited time, inconvenience, lack of self-motivation, dislike of exercise, low self-efficacy, and fear of being injured (Centers for Disease Control and Prevention, 2009).

The cancer care team may introduce the patient to promotion of fitness through a letter or a customized packet. Education, intervention, and ongoing support may start shortly after diagnosis or when the survivorship care plan is initiated. The survivorship care plan is based on the President’s Cancer Panel (U.S. Department of Health and Human Services, 2004) and the Institute of Medicine (IOM) and National Research Council (NRC) (2006) report, From Cancer Patient to Cancer Survivor: Lost in Transition. A portion of the survivorship care plan focuses on recommendations for preventive practices and maintenance of personal health and well-being. The focus of the therapeutic intervention will be limited to maximizing exercise in women who have completed adjuvant breast cancer therapy.

**Therapeutic Intervention**

Beginning exercise in a regimented manner improves the chances of maintaining the routine. Before starting an exercise routine, the cancer care team should gather detailed knowledge about the patient’s lifestyle and coach them to follow some basic guidelines adopted for breast cancer survivors (Cricket Rose & Keegan, 2005) (see Figure 2). Identifying different types of exercise programs in the community is beneficial. Some areas are fortunate enough to have programs geared toward cancer survivors. More cancer centers are developing exercise rehabilitation programs. Athletic clubs across the United States, including the YMCA (2009), are starting to develop specialty programs for cancer survivors. ASC has provided a grant to ACSM to develop cancer exercise specialist certification programs. The oncologist, radiation therapist, surgeon, and primary care physician may all need to be consulted before initiating a program. For women with limitations, a referral to a physical therapist may be the safest path before initiating a program for aerobic exercise and strength training.

The exercise or sport of choice should be something the survivor enjoys. It should not interfere with any possible disabilities. A prescription for the type, frequency, duration, and intensity of exercise needs to consider the individual’s age, prior fitness level, cancer therapy, and comorbid disease. Figure 3 contains simple suggestions to help the nurse individualize and encourage physical activities in breast cancer survivors. Warm-ups and cool downs are essential before and after each aerobic and nonaerobic exercise to decrease the risk for injury. The oncology nurse should work with the women to set realistic exercise goals, keeping in mind some benefits of exercise may not be immediately noticeable. On the other hand, survivors may notice beneficial changes in mental attitude and ability to cope with stress. Women may notice improved sleep patterns, strength and endurance, eating habits, appearance, posture, and stamina. As the individual makes progress, new goals can be set.

The nurse will determine with the survivor whether the outcomes for exercise are successful. Oncology nurses should keep...
records of counseling sessions indicating the diagnosis, type of counseling employed, and effectiveness of counseling. Figure 4 lists a few examples of resources to share with patients. Focus on exercise guidelines can lead to a general improvement to health and a decrease in risk of breast cancer recurrence and other major diseases. As seen in the case study, the oncology nurse can play a primary role in modeling the effects of healthy exercise. Having guidelines for a therapeutic exercise plan and intervention can help to ensure consistency and success (see Figure 5).

**Conclusion**

A moderate exercise program is justified for benefit in biopsychosocial health for breast cancer survivors. The exercise plan should be tailored to the survivor’s age, baseline fitness activities, type of therapy, and comorbid conditions. ACS (2007) recommends at least 30 minutes of moderate physical activity at least five days a week to reduce the risk for cancer, cardiovascular disease, and diabetes. Resistance training should be an integral component of the exercise plan. Established exercise guidelines, interventions, and evaluation from ACS and ACSM correspond well with IOM’s recommendations for a survivorship care plan.

A one-size-fits-all approach for developing a fitness program does not exist for cancer survivors. Fortunately, research is underway to allow nurses to help patients select the types of exercise that may be best for them. The oncology nurse is instrumental in creating a positive attitude, confidence in overcoming barriers, and a supportive social environment to foster a healthful exercise program after cancer treatment. Oncology nurses have the opportunity to encourage interdisciplinary collaboration for this population when and where appropriate. Savvy, enthusiastic oncology nurses are critical in maximizing an interdisciplinary care plan to drive education and commitment to a regular exercise program in breast cancer survivors. A customized exercise program following the completion of breast cancer therapy may be the ultimate prescription for helping a woman regain control and empowerment.

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**References**


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**Case Study**

Julie is a 42-year-old woman who has received a lumpectomy and axillary node dissection and has completed radiation therapy and chemotherapy for early-stage breast cancer. One month after completion of chemotherapy, Julie meets with her cancer care team. Julie has never taken part in a regular exercise program, but after reading health promotion materials from her cancer survivorship packet, she decides it may be a way to lose the 10 pounds gained during therapy. Julie has a demanding job and feels the exercise also may be a good outlet for stress. She wants to do everything possible to maintain a healthy lifestyle.

After clearance from her cancer care team, she is referred to a breast cancer exercise class organized by a cancer exercise specialist. The breast cancer survivor class meets once a week with a focus on core training, muscle strengthening, and aerobic exercise. The participants are given instruction for additional exercise outside of class. To prevent interference with regular exercise, Julie schedules the time on her calendar as if it were a business appointment.

Julie has been attending exercise classes for three months when she returns for a follow-up visit with the cancer care team. She thanks her oncologist for encouraging her to lose the extra weight she had gained during treatment. She is appreciative to the nurse who gave her the literature regarding benefits of physical fitness. Julie feels her moods have improved, her stress level is down, and she is able to fit into her pretreatment clothes. Lastly, she is grateful to the exercise specialist for giving her the confidence and inspiration she needed to adhere to a regular exercise routine. Julie senses she is regaining control over her body and life.


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