Exercise Guidelines for Adults With Cancer: A Vital Role in Survivorship

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Cancer survivors face many challenges as a result of their cancer diagnosis and treatment, most importantly the maintenance of physical well-being. Nurses and other health professionals strive to address the needs of cancer survivors, including providing appropriate health-promotion information for a physically active lifestyle. Cancer survivors are at greater risk for recurrence and for developing second cancers because of treatment effects, unhealthy lifestyle behaviors, or risk factors that contributed to the first cancer. In light of those concerns, guidelines aimed at understanding and preventing secondary disease, recurrence, and the late and long-term effects of treatment are essential.

Being physically active and maintaining a healthy weight can aid in the process of recovery, sustain quality of life, and improve survival after a cancer diagnosis (Doyle et al., 2006). More and more studies are supporting the benefits of starting or maintaining a program of regular physical activity after a cancer diagnosis (Bélanger, Plotnikoff, Clark, & Courneya, 2011; Courneya & Friedenreich, 2007, 2011; McNeeley & Courneya, 2010; Schmitz et al., 2005). Many cancer survivors are highly motivated to seek information about physical activity to improve their responses to treatment, fitness, and quality of life.

The American College of Sports Medicine (ACSM) convened a roundtable in June 2009 to review the safety and efficacy of exercise training during and after adjuvant cancer therapy. The ONS Foundation was a cosponsor of the event, which brought together a team of clinical and research experts in cancer and exercise. Those experts concluded that exercise training is safe and improves physical functioning, quality of life, and cancer-related fatigue in several cancer survivor groups; the roundtable generated evidence-based physical activity guidelines for adult cancer survivors (Schmitz, Courneya, et al., 2010).

Patients with cancer may experience a range of therapeutic approaches, including surgery, radiotherapy, chemotherapy, and hormonal and targeted therapies. The adverse effects of those treatments may be immediate (e.g., nausea associated with chemotherapy infusion), long-term (e.g., bone loss associated with endocrine therapies), or latent (e.g., arrhythmias or cardiomyopathies years after chemotherapy). Cancer treatments can adversely affect multiple physiologic systems and exercise tolerance. For example, breast cancer survivors experiencing fatigue, upper-extremity lymphedema, hot flashes, and arthralgia need individualized guidance for planned aerobic, resistance (i.e., weight training), and flexibility exercise. Cancer survivors may need to reduce the intensity or duration of recreational sports during some phases of the cancer continuum and carefully regulate their activity to a new level of satisfaction.

Exercise Guidelines

The ACSM Exercise Guidelines for Cancer Survivors (Schmitz, Courneya, et al., 2010) integrate exercise recommendations for the general population from the American Heart Association (Haskell et al., 2007) and the U.S. Department of Health and Human Services (Physical Activities Guidelines Advisory Committee, 2008). The American Cancer Society (ACS) makes recommendations for cancer survivors (Doyle et al., 2006), and clinical trials of exercise interventions provide additional evidence to support exercise for patients throughout the cancer experience. The key message for oncology nurses advising cancer survivors is that the exercise prescription should be individualized according to fitness level prior to cancer diagnosis, comorbidities, response to therapies, and adverse effects of treatments.

Exercise Testing

Before starting an exercise program, cancer survivors are advised to have a general medical assessment to evaluate for peripheral neuropathies, musculoskeletal morbidities, and other potential effects of cancer treatments and other comorbidities. Pre-exercise assessment is indicated for patients who receive therapies.
that increase the risk of bone fracture or cardiac toxicity. The ACSM also outlines cancer site-specific assessment recommendations before the start of an exercise program (Schmitz, Courneya, et al., 2010). For example, assessment of upper-extremity swelling is recommended for breast cancer survivors, and assessment of muscle strength and wasting is recommended for prostate cancer survivors. Evaluation of lower-extremity edema is a recommended pre-exercise assessment for survivors of gynecologic cancers. Morbidly obese patients (i.e., body mass index of 40 or greater) may require medical assessment beyond the cancer-specific recommendations (Schmitz, Courneya, et al., 2010).

The practical message to cancer survivors is that exercise is safe during and after most types of cancer treatment but that modifications are necessary for some patients. If the healthcare provider determines that physical activity restrictions are warranted, a written description is helpful to the patient and fitness professional. The restrictions can be revised as the cancer survivor moves through the continuum of treatment, recovery, and physical conditioning. Nurses can empower patients to ask their oncologist about new or revised physical activity restrictions at subsequent clinic visits.

Clinical exercise testing refers to the monitoring of physiologic responses to progressively increasing workloads, and typically is performed on a treadmill or cycle ergometer. The ACSM provides decision guidelines to identify individuals who need exercise testing prior to initiating a program of exercise (ACSM, 2010). The guidelines for exercise testing consider cardiovascular risk factors, the level of medical supervision required, and the intensity of proposed training. The general recommendation for cancer survivors is that exercise testing is not necessary before starting a physical activity plan that includes walking, resistance training (i.e., weight training), or flexibility exercise (Schmitz, Courneya, et al., 2010). Clinical exercise testing, however, may be recommended prior to starting moderate-to-vigorous cardiovascular aerobic exercise training (e.g., running, bicycling). Exercise testing and training is contraindicated for survivors experiencing acute illness or distress from a recent treatment or other conditions such as severe anemia (ACSM, 2010).

Exercise Prescription

Exercise prescription is the planning of physical activity with regard to the mode, duration, frequency, and intensity of exercise (ACSM, 2010). Many potential physical and psychosocial objectives of exercise prescription exist. The goals will vary according to the position of the survivor in the cancer experience. Short- and long-term physical activity goal setting is recommended to monitor progress, for motivation, and to facilitate the establishment of updated goals (Moore et al., 2007). With initial input from a fitness professional, cancer survivors can build exercise self-efficacy and achieve their long-term fitness strategies and goals over time. Research is underway to better understand the dose-response relationship between exercise and health outcomes in cancer survivors (Jones et al., 2010). The practical message to cancer survivors is that exercise is safe during and after most types of cancer treatment but that modifications are necessary for some patients (Schmitz, Courneya, et al., 2010).

Exercise by Cancer Site

The evidence for exercise recommendations is greatest for breast cancer, as most of the studies are done in that patient population, which supports the safety of exercise during and after breast cancer treatments. The benefits of exercise include improved aerobic fitness, muscular strength, flexibility, reduced body fat, increased lean mass, and reduced fatigue. Because a third to half of breast cancer survivors have long-term arm and shoulder morbidity, upper-extremity exercise is necessary, but swelling and other symptoms should be monitored carefully (Schmitz, Ahmed, et al., 2010; Schmitz, Courneya, et al., 2010). Research also indicates that exercise is safe for men with prostate cancer (Carmack Taylor et al., 2006; Galvão, Taaffe, Spry, Joseph, & Newton, 2010; Segal et al., 2009). The risk of cardiovascular disease increases with advanced age; therefore, promotion of regular aerobic exercise may be of added benefit to older prostate cancer survivors. Hormonal ablation (either pharmaceutical or surgical) can have detrimental effects on muscle and bone mass in men with prostate cancer (Daniell et al., 2000; Ott & Fulton, 2005; Preston et al., 2002). Resistance training may improve muscle strength and maintain or increase lean mass in this susceptible patient group. Patients may be concerned that resistance training will increase prostate-specific antigen, but this effect has not been found in clinical studies. An increased risk of fracture exists in men with bone metastases. As a result, some resistance exercises require modification, depending on the location of the metastasis.

The limited evidence to support exercise in colon cancer survivors precludes conclusive comment on the risk-to-benefit ratio of exercise (Schmitz, Courneya, et al., 2010). Instead, exercise recommendations are determined by the demographics of the patient population. Because most colon cancer survivors are older, comorbidities must be taken into account when prescribing exercise. If a colon cancer survivor has a stoma, resistance exercise should start with low weights and progress conservatively to prevent herniation of the stoma (Schmitz, Courneya, et al., 2010).

Evidence regarding the safety and efficacy of exercise in survivors of hematologic cancers who did not receive hematopoietic stem cell transplantation (HSCT) is limited. A large study showed improvements in physical function, fatigue, aerobic fitness, and body composition in patients on and off treatment (Courneya et al., 2009). Preliminary data from that study suggested that exercise did not interfere with chemotherapy completion rate or treatment efficacy. In patients treated with HSCT, no harm was associated with aerobic or resistance exercise training. Most but not all studies reviewed by ACSM found improvements in aerobic fitness, muscular strength, quality of life, and fatigue levels (Schmitz, Courneya, et al., 2010). Light-intensity exercise and slow training progression are recommended in this patient population because of compromised immune function.
Exercise recommendations for survivors of gynecologic cancers center on medical assessment of morbid obesity, peripheral neuropathy, and lower-limb lymphedema. Very limited data exist on the safety of resistance training in women with lower-limb lymphedema (Katz et al., 2010). Ovarian cancer survivors who met the public health exercise recommendations reported less fatigue, peripheral neuropathy, depression, anxiety, and sleep dysfunction (Stevinson et al., 2009).

The current evidence for specific exercise modifications is limited to breast, prostate, colon, hematologic, and gynecologic cancers. Oncology nurses need to communicate closely with patients and fitness professionals to monitor localized conditions and modify exercise accordingly.

**Conclusion**

Given the established benefits of regular exercise on the physical health and quality of life of cancer survivors, the need to provide evidence-based exercise recommendations to patients is greater than ever. Oncology clinicians who provide long-term survivorship care represent an important link in the dissemination of exercise information to patients. In addition, a larger network of well-trained fitness professionals (e.g., via ACSM Cancer Exercise Exercise Trainer certification) is needed to address the growing number of cancer survivor referrals. Fitness professionals can provide individual and group instruction to cancer survivors (using appropriate exercise modifications), create personal fitness goals (including short- and long-term benchmarks of success), and motivate patients through the phases of cancer survivorship. ACSM/ACS Certified Cancer Exercise Trainers can be found using the ACSM ProFinder tool at http://certification.acsm.org. The “LIVESTRONG at the YMCA” initiative seeks to make YMCAs sites for wellness activities geared for cancer survivors (for more information, visit www.livestrong.org/What-We-Do/Our-Actions/Programs-Partnerships/LIVESTRONG-at-the-YMCA). Other resources may be available in your area.

The ACSM Exercise Guidelines for Cancer Survivors (Schmitz, Courneya, et al., 2010), a landmark publication, needs to be disseminated and accessible to patients and clinicians. That requires that the guidelines are available in a patient-friendly language and format. They must then be provided to clinicians, who can convey the appropriate message in the teachable moment. Patient education materials are available at www.thecancerjourney.org/survivor/sur-1.

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**References**


Physical Activities Guidelines Advisory


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