

## **ACSM/ACS Certified Cancer Exercise Trainer**

### **EXERCISE PHYSIOLOGY AND RELATED EXERCISE SCIENCE**

- 1.1.1 Knowledge of physiologic outcomes that may be improved by exercise training among cancer survivors.
- 1.1.2 Knowledge of symptoms and psychological attributes that may be improved by exercise training among cancer survivors.
- 1.1.3 Knowledge of lymph, immunologic, cardiac, neurologic, and hematologic systems as they pertain to cancer specific exercise issues.
- 1.1.4 Knowledge of acute and chronic effects of exercise on temperature regulation and the adverse thermoregulatory/vasomotor symptoms (e.g. hot flashes) experienced by many cancer survivors.
- 1.1.5 Knowledge of cancer diagnosis and treatment effects on physiological response to acute and chronic exercise, particularly with regard to physical deconditioning, body composition changes, and range of motion.

### **HEALTH APPRAISAL, FITNESS AND CLINICAL EXERCISE TESTING**

- 1.3.1 Ability to obtain a basic history regarding cancer diagnosis (e.g., type, stage) and treatment (e.g., surgeries, systemic and targeted therapies).
- 1.3.2 Knowledge of and the ability to recognize the adverse acute, chronic, and late-effects of cancer treatments.
- 1.3.3 Ability to obtain medical history for other health conditions (e.g. neurological, cardiovascular, musculoskeletal, pulmonary) that may co-occur and interact with adverse effects of cancer treatments.
- 1.3.4 Knowledge of and ability to discuss physiologic systems affected by cancer and treatment and how this would affect the major components of fitness, including balance, agility, speed, flexibility, endurance, and strength.
- 1.3.5 Knowledge of how cancer and its treatments may alter balance, agility, speed, flexibility, endurance, and strength in cancer survivors and ability to select/modify and interpret tests of these fitness elements.
- 1.3.6 Knowledge of how cancer and its treatments may affect body composition in cancer survivors and ability to select/modify and interpret tests of body composition in cancer survivors.
- 1.3.7 Knowledge of categories of patients that require medical clearance prior to testing or exercise prescription.
- 1.3.8 Knowledge of cancer-specific relative and absolute contraindications to exercise testing.

### **EXERCISE PRESCRIPTION AND PROGRAMMING**

- 1.7.1 Knowledge of current American Cancer Society guidelines for exercise in cancer survivors.
- 1.7.2 Ability to describe benefits and risks of exercise training in the cancer survivor.
- 1.7.3 Ability to recognize relative and absolute contraindications for starting or resuming an exercise program, and knowledge of when it is necessary to refer participant back to an appropriate care provider.
- 1.7.4 Knowledge, skill and ability to modify exercise prescription/program based on:
  - a. current medical condition
  - b. time since diagnosis on or off adjuvant treatment
  - c. type of current therapies (e.g. no swimming during radiation)
  - d. type and recency of surgical procedures (e.g., curative or reconstructive)
  - e. range of motion

- f. presence of implants
- g. amputations/fusions
- h. effects of treatment on all elements of fitness (agility, speed, coordination, flexibility, strength, and endurance)
- i. hematologic considerations (e.g. anemia, neutropenia)
- j. presence of a central line (PIC or Port)
- k. current adverse effects of treatment, both acute and chronic
- l. individuals that may be at increased risk for adverse late effects that could increase risks associated with exercise (e.g., heart failure)

1.7.5 Knowledge of potential for overtraining with the cancer survivor.

1.7.6 Knowledge of and ability to use appropriate sun protection for outdoor programming.

#### **NUTRITION & WEIGHT MANAGEMENT**

- 1.8.1 Knowledge of common effects of cancer treatment on energy balance and body composition for individuals with non-metastatic disease.
- 1.8.2 Knowledge of effects of cancer cachexia on energy balance, intake, and activity level among individuals with metastatic disease.
- 1.8.3 Knowledge of relationship between body composition as a risk factor for the development of some cancers, and possibly as a risk factor for cancer recurrence.
- 1.8.4 Knowledge that many cancer survivors may use complementary and alternative medicine (CAM) approaches, and of the potential for these remedies to influence exercise testing and prescription parameters.
- 1.8.5 Ability to identify unintentional weight change that may relate to disease status, and recommend that the client seek appropriate medical attention.
- 1.8.6 Knowledge of effect of chemotherapy and radiation on the mouth and gastrointestinal system, and the result of these changes on appetite, and food preferences and choices.
- 1.8.7 Ability to discern when a participant's nutritional questions or status would be best managed by referral to a registered dietitian.
- 1.8.8 Knowledge of current American Cancer Society nutrition guidelines during and after cancer treatment.
- 1.8.9 Knowledge of hydration needs specific to cancer patients and survivors.
- 1.8.10 Knowledge of safety of weight loss programs for cancer survivors.

#### **HUMAN BEHAVIOR AND COUNSELING**

- 1.9.1 Knowledge to identify a teachable moment for cancer survivors and ability to use that time to provide appropriate information and education about resuming or adopting an exercise program.
- 1.9.2 General knowledge of psycho-social problems common to cancer survivors, such as depression, anxiety, fear of recurrence, sleep disturbances, body image, sexual dysfunction, and work and marital difficulties.
- 1.9.3 Knowledge of behavioral strategies that can enhance motivation and adherence (e.g. goal setting, exercise logs, planning).
- 1.9.4 Knowledge of the impact of cancer diagnosis and treatment on quality of life (QOL), and the potential for exercise to enhance a range of QOL outcomes for survivors (e.g. sleep, fatigue, and other factors).
- 1.9.5 Knowledge of and ability to determine effectiveness of group exercise programming vs. individual exercise to meet client's needs.

- 1.9.6 Knowledge of how cancer and cancer treatment relate to ability and readiness to start an exercise program.
- 1.9.7 Ability to facilitate the social support needs that are cancer specific including connections to websites and local support groups.

#### **SAFETY, INJURY PREVENTION, AND EMERGENCY PROCEDURES**

- 1.10.1 Knowledge of and ability to recognize and respond to cancer-specific safety issues, such as: susceptibility to infection, musculoskeletal and orthopedic changes, unilateral edema, fatigue, lymphedema, neurological changes, osteoporosis, cognitive decline associated with treatment.
- 1.10.2 Knowledge of and ability to respond to cancer specific emergencies, including: sudden loss of limb function, fever in immune-incompetent patient, and mental status changes.
- 1.10.3 Knowledge of and ability to respond to the signs and symptoms of new onset and major life threatening complications of cancer, such as superior vena cava syndrome (SVCS), sepsis or infection, and spinal cord compression.
- 1.10.4 Knowledge of and ability to write-up incident documentation related to cancer specific adverse events.

#### **PROGRAM ADMINISTRATION, QUALITY ASSURANCE & OUTCOME ASSESSMENT**

- 1.11.1 Knowledge of role in administration and program management within a cancer center, cancer treatment facility, and outpatient setting.
- 1.11.2 Knowledge of the types of exercise programs available in the community and which of these programs cater specifically to the needs of cancer survivors.
- 1.11.3 Knowledge of and ability to implement effective, professional business practices and ethical promotion of personal training services to the cancer care community (e.g. physicians, nurses, social workers, physical therapists, survivors and their families).
- 1.11.4 Knowledge of the Health Insurance Portability and Accountability Act (HIPAA) and ability to implement systems to ensure confidentiality of cancer related protected health information of participants.
- 1.11.5 Knowledge and ability to obtain referral from physician and communicate with physician about adverse events, abilities and limitations of survivor, and outcomes of testing and training.
- 1.11.6 Ability to recommend appropriate websites and refer to other health professionals.
- 1.11.7 Knowledge of reimbursement programs as eligible/available.

#### **CLINICAL AND MEDICAL CONSIDERATIONS**

- 1.12.1 Knowledge of the major long-term effects of treatment among childhood cancer survivors that may require careful screening and program adaptation for these individuals.
- 1.12.2 Knowledge of the common side effects and symptoms of typical cancer treatments (surgeries, chemotherapy, radiation, hormone manipulations, other drugs).
- 1.12.3 Knowledge that cancer treatment may accelerate functional decline associated with aging, particularly in the elderly, and that exercise programming may need to be adjusted accordingly.
- 1.12.4 Knowledge of the combined effects of aging and cancer-treatment on exercise capacity and selection of appropriate testing modalities and interpretation of results.

- 1.12.5 Knowledge of the common sites of metastases and ability to design and implement appropriate exercise programs consistent with this knowledge
- 1.12.6 Knowledge of the signs and symptoms associated with new onset lymphedema, and the major cancer types associated with increased lymphedema risk (e.g. breast, head and neck cancer).
- 1.12.7 Knowledge of National Lymphedema Network (NLN) 18 risk reduction practices, and exercise guidelines.
- 1.12.8 Knowledge of how cancer treatment may alter cardiovascular risk factors, and inappropriate cardiovascular responses to exercise testing or training.
- 1.12.9 Knowledge of lymphatic, neurological and immune system factors in cancer survivors that may require further evaluation by medical or allied health professionals before participation in physical activity.
- 1.12.10 Knowledge of how common cancer treatments affects the ability of cancer survivors to perform exercise, and how to adjust programs accordingly.
- 1.12.11 Knowledge of the effect of cancer treatment on balance and mobility and the ability to develop an appropriate exercise program that minimizes fall/injury risk.
- 1.12.12 Knowledge and ability to recognize the limits in the scope of practice for exercise professionals in working with cancer survivors with complex medical issues.

#### **PHYSIOLOGY, DIAGNOSIS & TREATMENT**

- 1.15.1 Knowledge of currently accepted screening practices for surveillance of recurrence for common cancers (e.g. mammography, colonoscopy, prostate specific antigen, pap smears).
- 1.15.2 Knowledge of the pathology tests used to diagnose common cancers (e.g. biopsy, imaging technologies, and blood tests for tumor markers).
- 1.15.3 Knowledge of how to communicate effectively with the major medical specialties with whom cancer survivors may interact, including surgery, medical oncology, radiology, dietitians, and psychologists/psychiatrists.
- 1.15.4 Knowledge of the most common warning signs of recurrence for common cancers, and when to recommend that clients seek additional medical evaluation.
- 1.15.5 Understand typical durations of cancer therapy for the major cancers (breast, prostate, melanoma, ovary, lung, colon), and that therapies are continually evolving/changing.
- 1.15.6 General knowledge of current cancer treatment strategies, including surgery, systemic therapies (e.g. chemotherapy) and targeted therapies (e.g. anti-angiogenesis inhibitors).
- 1.15.7 Knowledge of how lifestyle factors, including nutrition, physical activity, and heredity, influence hypothesized mechanisms of cancer etiology.
- 1.15.8 General knowledge of the descriptive epidemiology of cancer, including the prevalence, incidence, and survival statistics for the major cancer types.
- 1.15.9 General knowledge of cancer biology (e.g., initiation, promotion/progression, and metastases), particularly for the four most common cancers: lung, breast, colon, and prostate.