**ACSM (2021) Guidelines for Exercise Testing and Prescription, 11th Edition:**

**Contraindications for Starting Exercise, Stopping Exercise, and Injury Risk for Cancer Survivors**

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|  | **Breast** | **Prostate** | **Colon** | **Adult**  **Hematologic**  **(No HSCT)** | **Adult**  **HSCT** | **Gynaecologic** |
| **General contraindications for starting an exercise program common across all cancer sites** | Allow adequate time to heal after surgery. The number of weeks required for surgical recovery may be as high as 8. Do not exercise individuals who are experiencing fever, extreme fatigue, significant anaemia, or ataxia. Follow ACSM Guidelines for exercise prescription about cardiovascular and pulmonary contraindications for starting an exercise program. However, the potential for an adverse cardiopulmonary event might be higher among cancer survivors than in age-matched comparisons given the toxicity of radiotherapy and chemotherapy and the long-term/late effects of cancer surgery. | | | | | |
| **Cancer-specific contraindications**  **for starting an exercise**  **program** | Women with acute  arm or shoulder problems secondary  to breast cancer treatment should seek medical care to resolve those issues before exercise training  with the upper body. | **None** | Physician permission is recommended for patients with an ostomy before participation in contact sports (risk of blow), weight training (risk of hernia) | **None** | **None** | Women with swelling or inflammation in the abdomen, groin, or lower extremity should seek medical care to resolve these issues before exercise training with the lower body. |
| **Cancer-specific reasons for stopping an exercise program. (Note: General ACSM Guidelines for stopping exercise remain in place for this population.)** | Changes in arm/shoulder symptoms or swelling should result in reductions or avoidance of upper body exercise until after appropriate medical evaluation and treatment resolve the issue. | **None** | Hernia, ostomy-related systemic infection. | **None** | **None** | Changes in swelling or inflammation of the abdomen, groin, or lower extremities should result in reductions or avoidance of lower body exercise until after appropriate medical evaluation and treatment resolve the issue. |
| **General injury risk issues in common across cancer sites** | Patients with bone metastases may need to alter their exercise program in intensity, duration, and mode given the increased risk for skeletal fractures. Infection risk is higher for patients that are currently undergoing chemotherapy or radiation treatment or have compromised immune function after treatment. Care should be taken to reduce infection risk in fitness centres frequented by cancer survivors. Patients currently in treatment and immediately following treatment may vary from exercise session to exercise session about exercise tolerance, depending on their treatment schedule. Individuals with known metastatic disease to the bone will require modifications and increased supervision to avoid fractures. Individuals with cardiac conditions (secondary to cancer or not) will require modifications and may require | | | | | |
| **Cancer-specific risk of injury, emergency**  **procedures** | The arms/shoulders should be exercised, but proactive injury prevention approaches are encouraged, given the high incidence of arm/ shoulder morbidity in breast cancer survivors. Women with lymphedema should wear a well-fitting compression garment during exercise. Be aware of the risk for fracture among those treated with hormonal therapy, a diagnosis of osteoporosis, or bony metastases. | Be aware of the risk for fracture among patients treated with ADT, a diagnosis of osteoporosis or bone | Advisable to avoid excessive intraabdominal pressures for patients with an ostomy. | Multiple myeloma patients should be treated as if they are osteoporotic. | **None** | The lower body should be exercised, but proactive injury prevention approaches are encouraged, given the potential for lower extremity swelling or inflammation in this population. Women with lymphedema should wear a well-fitting compression garment during exercise. Be aware of the risk for fractures among those treated with hormonal therapies, diagnosed with osteoporosis, or with bony metastases. |
| **Abbreviations:** ACSM, American College of Sports Medicine; ADT, androgen deprivation therapy; HSCT, hematopoietic stem cell transplantation.  **Source:** Campbell KL, Winters-Stone KM, Wiskemann J, et al. Exercise guidelines for cancer survivors: a consensus statement from the international multidisciplinary roundtable. Med Sci Sports Exerc. 2019;51(11):2375–2390. | | | | | | |

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|  | **Breast** | **Prostate** | **Colon** | **Adult**  **Hematologic**  **(No HSCT)** | **Adult**  **HSCT** | **Gynaecologic** |
| **General Statement** | Avoid inactivity and return to normal daily activities as quickly as possible after surgery. Continue normal daily activities and exercise as much as possible during and after non-surgical treatments. Individuals with the known metastatic bone disease will require modifications to avoid fractures. Individuals with cardiac conditions (secondary to cancer or not) may require modifications and may require greater supervision for safety. | | | | | |
| **Aerobic exercise**  **training**  **(Volume,**  **intensity,**  **progression)** | Recommendations are the same as age-appropriate guidelines from the PAGs for Americans. | | | | Ok to exercise every day, lighter intensity and lower progression of intensity are recommended. | Recommendations are the same as age-appropriate guidelines from the PAGs for Americans. Women with morbid obesity may require additional supervision and altered programming. |
| **Cancer site-specific comments on aerobic exercise training prescriptions** | Be aware of fracture risk. | Be aware of the increased potential for fracture. | Physician permission is recommended for patients with an ostomy before participation in contact sports (risk of blow). | **None** | Care should be taken to avoid overtraining given the immune effects of vigorous exercise. | If peripheral neuropathy is present, a stationary bike might be preferable overweight-bearing exercise. |
| **Resistance training (volume, intensity, progression)** | Altered recommendations. See below. | Recommendations same as age-appropriate PAGs. | Altered recommendations. See below. | Recommendations same as age-appropriate PAGs. |  | Altered recommendations. See below. |
| **Cancer site**  **specific comments on resistance training prescription** | Start with a supervised program of at least 16 sessions and very low resistance, progress resistance at small increments. No upper limit on the amount of weight to which survivors can progress. Watch for arm/shoulder symptoms, including lymphedema, and reduce resistance or stop specific exercises according to symptom response. If a break is taken, lower the level of resistance by 2 wk. worth for every wk. of no exercise (e.g., a 2-wk. exercise vacation = lower to the resistance used 4 wk. ago). Be aware of the risk for fracture in this population. | Add pelvic floor exercises for those who undergo radical prostatectomy. Be aware of the risk for fracture. | Recommendations same as age-appropriate PAGs. For patients with a stoma, start with low resistance and progress resistance slowly to avoid herniation at the stoma. | **None** | Resistance training might be more important than aerobic exercise in BMT patients. See text for further discussion on this point | There is no data on the safety of resistance training in women with lower-limb lymphedema secondary to gynaecologic cancer. This condition is very complex to manage. It may not be possible to extrapolate from the findings on upper limb lymphedema. Proceed with caution if the patient has had lymph node removal and/or radiation to lymph nodes in the groin. |
| **Flexibility training**  **(Volume, intensity, progression)** | Recommendations are the same as age appropriate PAGs for Americans. |  | Recommendations same as age appropriate PAGs, with care to avoid excessive intraabdominal pressure for patients with ostomies. | Recommendations are the same as age appropriate PAGs for Americans. |  |  |
| **Exercises with special considerations (e.g., yoga, organized sports, and Pilates)** | Yoga appears safe if arm and shoulder morbidities are taken into consideration. Dragon boat racing is not empirically tested, but the volume of participants provides face validity of safety for this activity. No evidence of organized sport or Pilates. | There is a gap in the research | If an ostomy is present, modifications will be needed for swimming or contact sports. Research gap. | There is a gap in the research | There is a gap in the research | There is a gap in the research |
| **Abbreviations:** BMT, bone marrow transplantation; HSCT, hematopoietic stem cell transplantation; U.S. DHHS, U.S. Department of Health, and Human Services.  **Source:** Campbell KL, Winters-Stone KM, Wiskemann J, et al. Exercise guidelines for cancer survivors: a consensus statement from the international multidisciplinary roundtable. Med Sci Sports Exerc. 2019;51(11):2375–2390. | | | | | | |