

The Role of Exercise in Cancer Rehabilitation

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2009 ACS Cancer Statistics

- Nearly 1.5 million new cases of cancer diagnosed in the U.S.
- 500,000 cancer related deaths
- Currently 12 million cancer survivors with the number growing each year.



American Cancer Society/National Cancer Institute Statistics

- The number of Americans living with cancer will increase by nearly a third to almost 18 million by 2022.
- The number of cancer survivors is on the rise due to a growing - and aging - U.S. population.
- Nearly one-half of American cancer survivors are age 70 or older.
- Only 5% are 40 or younger.
- The median age of patients at the time of diagnosis is 66.



American Cancer Society/National Cancer Institute Statistics

- The three most common cancers among men living with the disease are prostate cancer, colorectal cancer and melanoma.
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- 58,510 survivors of childhood cancer living in the United States.
- 12,060 more children will be diagnosed in 2012.



Need For Improved Care

- Survivors must cope with the long-term effects of treatment, as well as psychological concerns such as fear of recurrence.
- 94% of U.S. primary care doctors were unaware of the long-term side effects of some of the most commonly used chemotherapy drugs.
- Increasingly important that the medical community understand their unique healthcare needs.



Cancer Rehabilitation

- Sub-specialty of rehabilitation medicine concerned with restoring the highest possible functional status and quality of life to cancer patients and or survivors.
- Rehabilitation medicine physicians specialize in the evaluation and treatment of neuromuscular, musculoskeletal, and functional complications of cancer and cancer treatments (i.e. surgery, radiation, and chemotherapy).



Cancer Rehabilitation

- Has a role in patients undergoing active treatment for cancer and in cancer survivors.
- Offers a unique opportunity to effectively prescribe exercise for rehabilitative purposes.



Cancer Survivor Definition

NCI Definition of Cancer Survivor-

- "An individual is considered a **cancer survivor** from **the time of diagnosis, through the balance of his or her life**. Family members, friends, and caregivers are also impacted by the survivorship experience and are therefore included in this definition."

NCI Definition of Cancer Survivorship

- "In cancer, survivorship focuses on **the health and life of a person with cancer post treatment until the end of life**. It covers the physical, psychosocial, and economic issues of cancer, beyond the diagnosis and treatment phases. Survivorship includes issues related to the ability to get health care and follow-up treatment, late effects of treatment, second cancers, and quality of life. Family members, friends, and caregivers are also considered part of the survivorship experience".



EXERCISE IS MEDICINE



The Case For Exercise

- Exercise has been shown to improve QoL in cancer survivors.
- Improvement in physical function following rehabilitation is associated with decreased fatigue in cancer patients.
- Increased physical activity after cancer diagnosis reduces risk of recurrence and mortality.



The Case For Exercise In Cancer Rehab

- Growing body of evidence suggests exercise decreases the risk of many cancers.
- Data including RCTs support the role of exercise in the extension of survival in breast and colon cancer.

1) Holmes M et al. Physical Activity and survival after breast cancer diagnosis. *JAMA*. 2005;293:2479-86.

2) Meyerhardt JA et al. Physical activity and survival after colorectal cancer diagnosis. *J Clin Oncol*. 2006;24:3527



Benefits of Exercise in Cancer Patients and or Survivors

- Potential to reduce body fat.
- Lowers levels of insulin
- Lowers levels of sex hormones (androgens and estrogens)
- Lowers IGF-1 and IGFBP
- Lowers levels of adipokines
- Lowers inflammation (CRP)



The Most Important and Long-Lasting Physical Problems in Cancer Patients

- Decreased maximal oxygen uptake ($VO_{2Max} < 20$ ml/kg min)- Compounded by CTX and RTX.
- Muscle wasting followed by loss of strength- Affects about 50% of cancer patients.
- Fatigue-Experienced in 61-99% of cases
- Reduced physical and reduced role functioning



ACSM Guidelines for Healthy Adults

Healthy Adults Under 65 Years

- Do moderately intense aerobic/cardio exercise 30 minutes a day 5 days a week.
- Or
- Do vigorously intense aerobic/cardio exercise 20 minutes a day, 3 days a week
- Do 10 strength training exercises, 8-12 repetitions of each exercise twice per week.



ACSM Guidelines for Healthy Adults

Healthy Adult Over 65 years

- Do moderately intense aerobic/cardio exercise 30 minutes a day 5 days a week.
- Or
- Do vigorously intense aerobic/cardio exercise 20 minutes a day, 3d/wk
- Do 10 strength training exercises, 10-15 repetitions of each exercise twice per week.
- Perform Balance Exercises
- Have an activity plan



ACSM Roundtable on Exercise Guidelines for Cancer Survivors

- AVOID INACTIVITY
- Return to normal activities as quickly as possible after surgery. Continue normal daily activities and exercise as much as possible during/after nonsurgical treatments.
- Aerobic, PRE, and flexibility exercise recommendations are the same as age-appropriate physical activity guidelines for Americans.



ACSM Roundtable on Exercise Guidelines for Cancer Survivors

- Individuals with known metastatic bone disease may require modifications and greater supervision for safety.



ACSM Roundtable on Exercise Guidelines for Cancer Survivors

- The exercise prescription should be adjusted based on the unique impairments present for any given cancer diagnosis.
- When appropriate further testing should be performed and clearance granted by referring oncologist and or internal medicine specialist.



ACSM Roundtable on Exercise Guidelines for Cancer Survivors

- Exercise program may need to be adapted for the individual survivor on the basis of health status.
- Exercise prescriptions should be individualized according to a cancer survivor's pretreatment aerobic fitness, medical comorbidities, response to treatment, and immediate persistent negative effects of treatment experienced.



ACSM Roundtable on Exercise Guidelines for Cancer Survivors

- The guidelines clearly list cancer diagnosis specific precautions and reasons for stopping exercise.
- Provides recommendations for pre-exercise assessments and testing specific to the most common forms of cancer.



ACSM Guidelines Exercise Risk Assessment

- Formal risk assessment recommended for men over 40 and women over 50 unaccustomed to exercising before embarking on a vigorous program.
- Physical Activity Readiness (PAR-Q) Form- Consists of 7 screening questions that identifies risk factors requiring patients to undergo further pre-exercise assessment.



General Contraindications For Starting An Exercise Program After a Cancer Diagnosis

- Allow adequate time to heal after surgery
- Do not exercise in setting of extreme fatigue, anemia, or ataxia.



ACSM Exercise Risk Assessment Algorithm

- Low Risk- No clearance for moderate or vigorous activity. No supervision
- Moderate Risk- Need clearance for vigorous activity. Recommend professional supervision.
- High Risk- Needs clearance for all activity and requires clinical supervision.



Future Directions

- Is it more feasible to administer exercise prescription interventions in a group setting via trained health counselors and educators?
- Can also be done remotely over the telephone or internet.
- Requires additional training on the psycho-social aspects of helps patients change behavior.
- Physiatry consultation is beneficial to safely guide the exercise prescription and handle any resulting injuries or difficulties the patient may have after starting regimen.




