UNC HEALTH CARE WELLNESS CENTERS

The Benefits of Exercise for Cancer Patients

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Clinical Exercise Physiologist
Cardiac Rehab
UNC Wellness Center at Meadowmont

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Objectives

- Explain the components of a cancer exercise program
- Describe the American College of Sports Medicine Guidelines for exercise in cancer patients
- Discuss the effect of exercise on cancer patients

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Who is an exercise physiologist?

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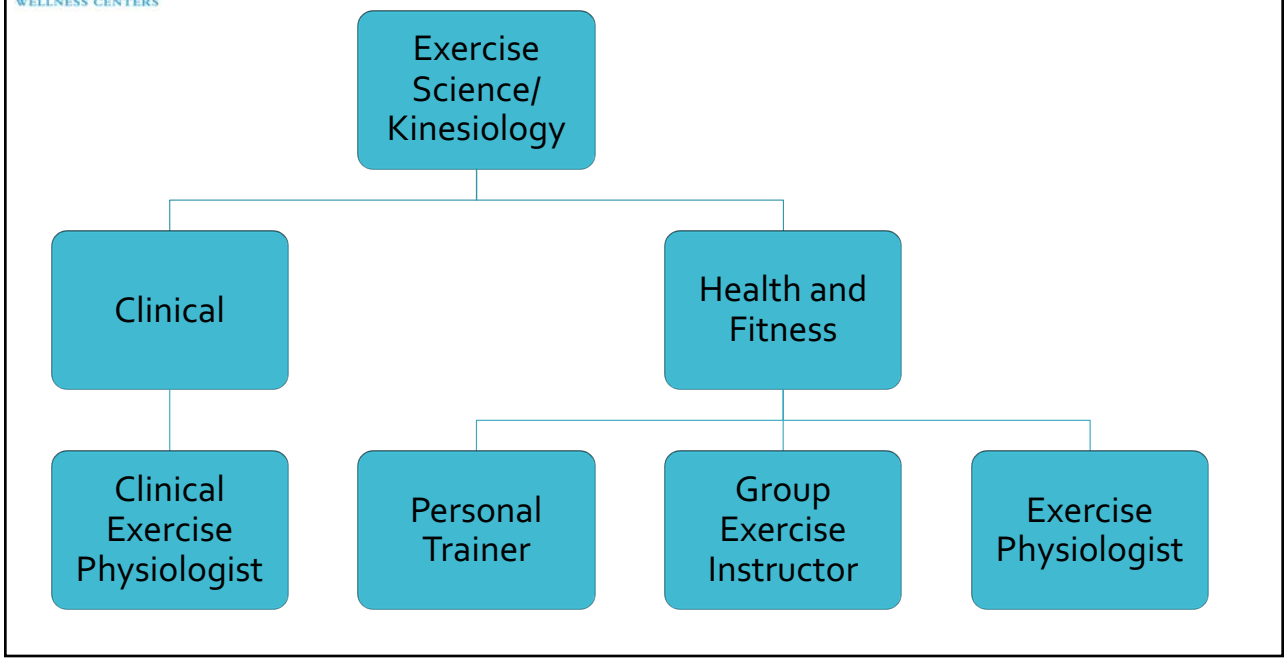

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ACSM/ACS Cancer Exercise Trainer (CET)

Must pass the CET exam covering topics including:

- Exercise Prescription/Programming
- Health Appraisal, Fitness, and Clinical Exercise Testing
- Exercise Physiology and Related Exercise Science
- Clinical and Medical Considerations
- Physiology, Diagnosis, and Treatment
- Safety, Injury Prevention, and Emergency Procedures
- Human Behavior and Counseling
- Nutrition and Weight Management
- Program Administration, Quality Assurance, and Outcomes Assessment

CET. https://www.acsm.org/get-stay-certified/get-certified/specialization/cet. Accessed December 20, 2019.

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What is Exercise-oncology?


OXFORD ACADEMIC

Annals of Behavioral Medicine

SOCIETY OF BEHAVIORAL MEDICINE

A Longitudinal Study of Exercise Barriers in Colorectal Cancer Survivors Participating in a Randomized Controlled Trial

Kerry S. Courneya, Ph.D., Christine M. Friedenreich, Ph.D., H. Arthur Quinney, Ph.D., Anthony L. A. Fields, M.D., Lee W. Jones, Ph.D., Jeffrey K. H. Vallance, M.A., Adrian S. Fairey, M.Sc.

Annals of Behavioral Medicine, Volume 29, Issue 2, April 2005, Pages 147–153, https://doi.org/10.1207/s15324796abm2902_9

Published: 01 April 2005

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Exercise-oncology

- A subspecialty within a multidisciplinary cancer care team concerned with understanding the effects of exercise as a primary form of prevention and complementary form of treatment throughout the cancer survivor continuum (prediagnosis through survivorship).

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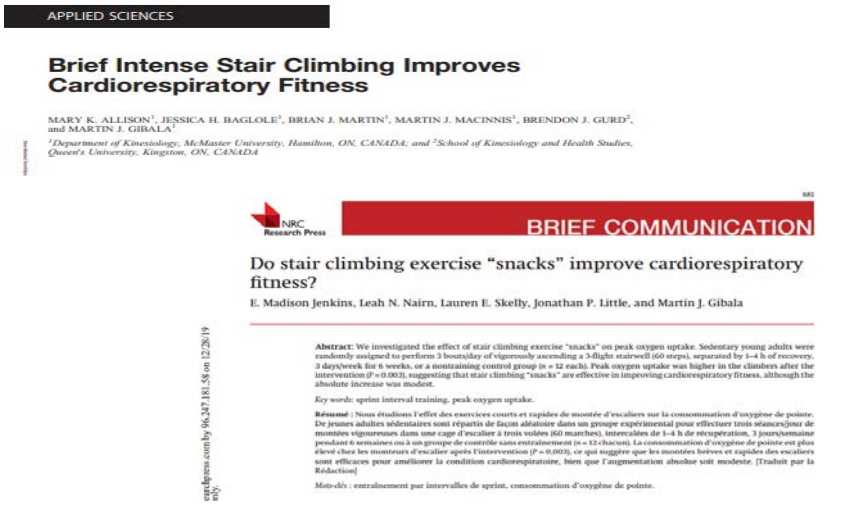
"EXERCISE SNACK!"



APPLIED SCIENCES

Brief Intense Stair Climbing Improves Cardiorespiratory Fitness

MARY K. ALLISON[1], JESSICA H. BAGLOLE[1], BRIAN J. MARTIN[1], MARTIN J. MACINNIS[1], BRENDON J. GURD[2], and MARTIN J. GIBALA[1]

[1]Department of Kinesiology, McMaster University, Hamilton, ON, CANADA; and [2]School of Kinesiology and Health Studies, Queen's University, Kingston, ON, CANADA

NRC Research Press

BRIEF COMMUNICATION

Do stair climbing exercise "snacks" improve cardiorespiratory fitness?

E. Madison Jenkins, Leah N. Nairn, Lauren E. Skelly, Jonathan P. Little, and Martin J. Gibala

Abstract: We investigated the effect of stair climbing exercise "snacks" on peak oxygen uptake. Sedentary young adults were randomly assigned to perform 3 bouts/day of vigorously ascending a 3-flight stairwell (60 steps), separated by 1–4 h of recovery, 3 days/week for 6 weeks, or a nontraining control group (*n* = 12 each). Peak oxygen uptake was higher in the climbers after the intervention ($P = 0.003$), suggesting that stair climbing "snacks" are effective in improving cardiorespiratory fitness, although the absolute increase was modest.

Key words: sprint interval training, peak oxygen uptake.

Résumé : Nous étudions l'effet des exercices courts et rapides de montée d'escaliers sur la consommation d'oxygène de pointe. De jeunes adultes sédentaires sont répartis de façon aléatoire dans un groupe expérimental pour effectuer trois séances/jour de montées vigoureuses dans une cage d'escalier à trois volées (60 marches), intercalées de 1–4 h de récupération, 3 jours/semaine pendant 6 semaines ou à un groupe de contrôle sans entraînement (*n* = 12 chacun). La consommation d'oxygène de pointe est plus élevé chez les monteurs d'escalier après l'intervention ($P = 0,003$), ce qui suggère que les montées brèves et rapides des escaliers sont efficaces pour améliorer la condition cardiorespiratoire, bien que l'augmentation absolue soit modeste. [Traduit par la Rédaction]

Mots-clés : entraînement par intervalles de sprint, consommation d'oxygène de pointe.

- As little as 20 seconds of exercise done several times a day may be enough to improve fitness levels

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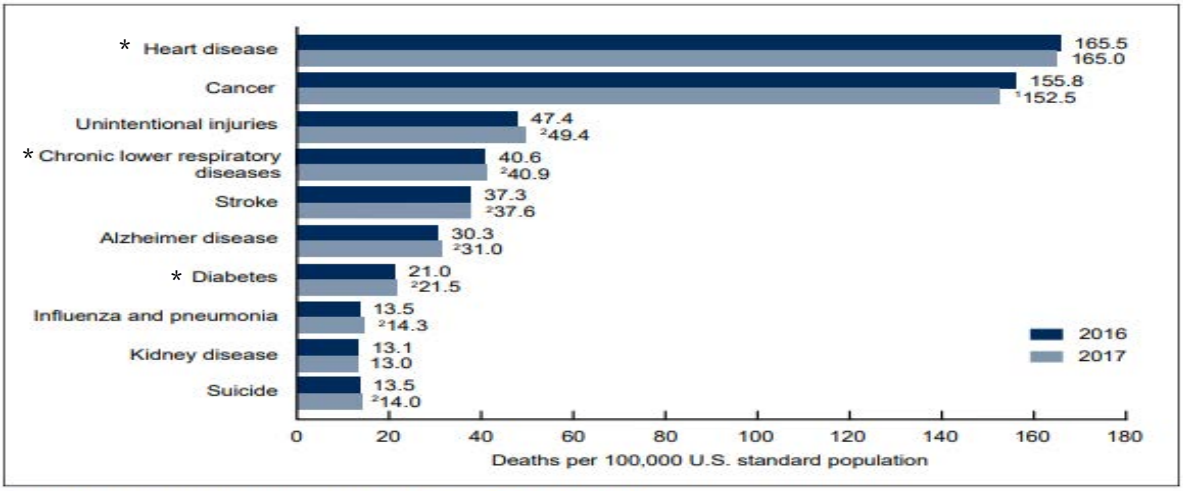
Age-adjusted Death Rates for the 10 Leading Causes of Death: United States , 2016 and 2017



[1]Statistically significant decrease in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
[2]Statistically significant increase in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
NOTES: A total of 2,813,503 resident deaths were registered in the United States in 2017. The 10 leading causes accounted for 74.0% of all deaths in the United States in 2017. Causes of death are ranked according to number of deaths. Rankings for 2016 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db328_tables-508.pdf#4.
SOURCE: NCHS, National Vital Statistics System, Mortality.

Murphy SL, Xu JQ, Kochanek KD, Arias E. Mortality in the United States, 2017. NCHS Data Brief, no 328. Hyattsville, MD: National Center for Health Statistics. 2018.

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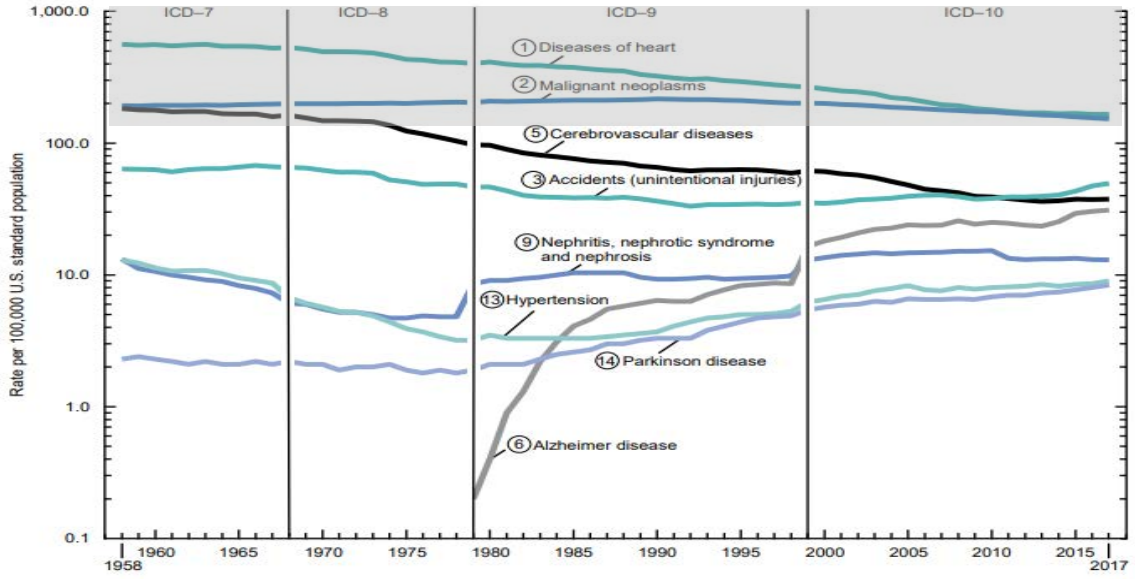

NOTES: ICD is the *International Classification of Diseases*. Circled numbers indicate ranking of conditions as leading causes of death in 2017.
SOURCE: NCHS, National Vital Statistics System, Mortality.

Kochanek KD, Murphy SL, Xu JQ, Arias E. Deaths: Final data for 2017. National Vital Statistics Reports; vol 68 no 9. Hyattsville, MD: National Center for Health Statistics. 2019.

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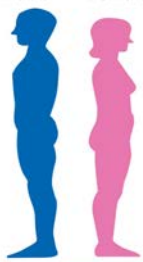
Estimated New Cases

Males			Females		
Prostate	174,650	20%	Breast	268,600	30%
Lung & bronchus	116,440	13%	Lung & bronchus	111,710	13%
Colon & rectum	78,500	9%	Colon & rectum	67,100	8%
Urinary bladder	61,700	7%	Uterine corpus	61,880	7%
Melanoma of the skin	57,220	7%	Melanoma of the skin	39,260	4%
Kidney & renal pelvis	44,120	5%	Thyroid	37,810	4%
Non-Hodgkin lymphoma	41,090	5%	Non-Hodgkin lymphoma	33,110	4%
Oral cavity & pharynx	38,140	4%	Kidney & renal pelvis	29,700	3%
Leukemia	35,920	4%	Pancreas	26,830	3%
Pancreas	29,940	3%	Leukemia	25,860	3%
All Sites	**870,970**	**100%**	**All Sites**	**891,480**	**100%**

Estimated Deaths

Males			Females		
Lung & bronchus	76,650	24%	Lung & bronchus	66,020	23%
Prostate	31,620	10%	Breast	41,760	15%
Colon & rectum	27,640	9%	Colon & rectum	23,380	8%
Pancreas	23,800	7%	Pancreas	21,950	8%
Liver & intrahepatic bile duct	21,600	7%	Ovary	13,980	5%
Leukemia	13,150	4%	Uterine corpus	12,160	4%
Esophagus	13,020	4%	Liver & intrahepatic bile duct	10,180	4%
Urinary bladder	12,870	4%	Leukemia	9,690	3%
Non-Hodgkin lymphoma	11,510	4%	Non-Hodgkin lymphoma	8,460	3%
Brain & other nervous system	9,910	3%	Brain & other nervous system	7,850	3%
All Sites	**321,670**	**100%**	**All Sites**	**285,210**	**100%**



Siegal RL, Miller KD, Jemal A. Cancer Statistics, 2019. *CA Cancer J Clin.* 2019;69(1): 7-34.

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Odds of Developing Cancer in the US?

1,762,450 new cancer cases

331,883,986 total population

X 100

=

53%

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EXERCISE SNACK #1

WALL PUSH UP

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Where Can I Exercise?

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ANYWHERE!

Here

There

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LiveFit CANCER EXERCISE PROGRAM

LiveFit Cancer Exercise Program

- Designed to help any type of cancer survivor ease their way back into physical activity with the help of trained fitness professionals
- 10-week individualized group exercise program
- Held at UNC Meadowmont Wellness Center
- Limited to 6-12 participants
- Cost: Members: $100 Non-Members: $120

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LiveFit CANCER EXERCISE PROGRAM

LiveFit Cancer Exercise Program

Progressive exercise will include, but is not limited to:

Cardio Machines	Strength Training
Functional Training	Core Training
Flexibility/Range of Motion	Aqua Aerobics
Yoga	Low-impact Aerobics
Mindfulness/Meditation Training	Nutritional Counseling

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LiveFit CANCER EXERCISE PROGRAM

LiveFit Cancer Exercise Program

Prior to Participation

- Completed Application:
  - Doctor's consent
  - Review of medical history
  - Health-related questionnaires
- Functional Testing:
  - Body Composition
  - Vitals
  - 6-minute Walk Test
  - 1-RM Strength Test

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Get REAL & HEEL

- Provided post-treatment support for women with a breast cancer diagnosis since 2006
- Designed to help cancer survivors regain strength, cardiovascular fitness, flexibility, balance, coping, and hopefulness
- 16-week individualized group exercise program
- Held at Outdoor Education Center on the UNC campus
- Cost: FREE of charge, offset by donations
- Eligibility Requirements:
  - Diagnosed with cancer
  - Completed treatment within the past year

Carly Bailey
UNC Lineberger Comprehensive Cancer Center Physical Activity and Wellness Coordinator
919-445-4255
Carly_bailey@med.unc.edu

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YMCA Livestrong Program

LIVESTRONG

- Designed to get cancer survivors back on their feet
- 12-week exercise program
- Held at local YMCA

https://www.ymcatriangle.org/programs/fitness-and-wellness/livestrong-ymca

- Cost: Survivors and family receive FREE membership to the YMCA, due to Annual Campaign

Louise Keefer
Health Coach
Chapel Hill-Carrboro YMCA/ Chatham YMCA
919-987-8837

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ULMAN FOUNDATION

Ulman Cancer to 5k

- Provides a community of support
- Regardless of age, treatment status, or physical ability, survivor participants run/walk alongside coaches & volunteer "sherpas" with the ultimate goal of completing a 5K goal race
- 12-week program
- Training location: Raleigh, NC
- Cost: FREE

Jack Bowling
Coach

cancerto5k@ulmanfoundation.org

ZacTurner
Coach

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EXERCISE SNACK #2

SIT-TO-STANDS/ CHAIR SQUATS

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Why Should I Exercise?

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American College of Sports Medicine Exercise Recommendations

- **Aerobic training-** 150 minutes/wk of moderate intensity activity, 75 minutes/wk of vigorous activity OR a combination of both

- **Resistance training-** 2-3 days/wk using all major muscle groups

American College of Sports Medicine,, In Riebe, D., In Ehrman, J. K., In Liguori, G., & In Magal, M. (2018). *ACSM's guidelines for exercise testing and prescription*.

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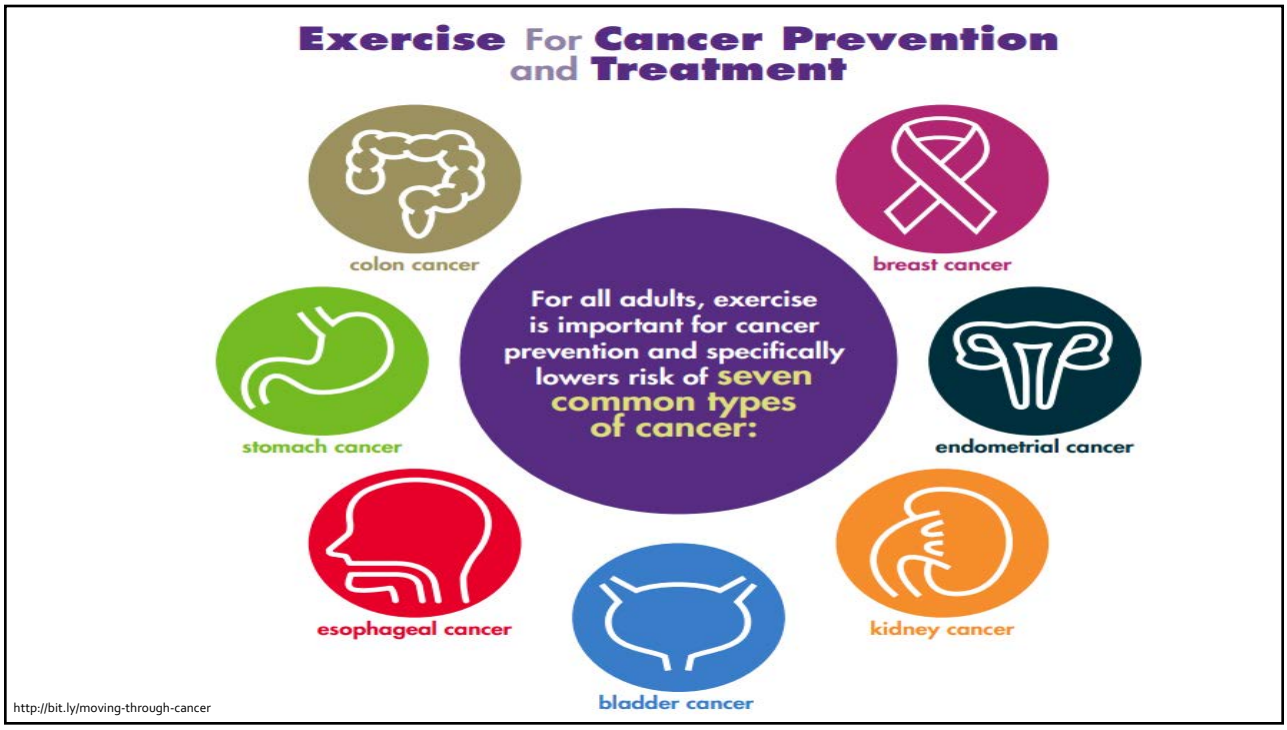

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American College of Sports Medicine Exercise Recommendations for Cancer Patients

Aerobic Training

***Overall goal*:** Progress gradually to 150 min./wk of moderate-intensity exercise

- **Frequency:** 3-5x/wk
- **Intensity:**
  - Moderate: 40%-59% VO_2R; 64%-75% HR_{max}; 5-6 RPE (OMNI scale); 12-13 RPE (BORG scale)
  - Vigorous: 60%-89% VO_2R; 76%-95% HR_{max}; 7-8 RPE (OMNI scale); 14-17 RPE (BORG scale)
- **Duration:** ≥150 min./wk of moderate intensity or ≥75 min./wk of vigorous intensity, or an equivalent combination
- **Progression:** 30s-2min. longer per day
- **Mode:** Prolonged rhythmic activities using large muscle groups (walking, cycling, swimming)
- **Other goals:** Increase peak VO_2, total work, endurance
- **Special considerations:**

* Intensity may need to be adjusted during treatment to <50% HRR or RPE 9-11

* Exercise can be divided into 2-3 sessions/ day and begin at 5-10 min.

American College of Sports Medicine,, In Riebe, D., In Ehrman, J. K., In Liguori, G., & In Magal, M. (2018). *ACSM's guidelines for exercise testing and prescription*.

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American College of Sports Medicine Exercise Recommendations for Cancer Patients

Resistance Training

- **Frequency:** 2-3x/wk
- **Intensity:** begin with < 30% 1RM and progress in small increments
- **Duration:** ≥1 set 8-12 reps for each muscle group
- **Progression:** Gradual increase in resistance (1.1-2.3kg) following 2 consecutive symptom-free sessions
- **Mode:** Free weights, resistance machines, weight-bearing functional tasks
- **Goals:** Increase muscle strength/endurance
- **Special considerations:**

* Patients with metastatic bone disease/hormonal treatments
  - avoid excessive weight-bearing activities

American College of Sports Medicine,, In Riebe, D., In Ehrman, J. K., In Liguori, G., & In Magal, M. (2018). *ACSM's guidelines for exercise testing and prescription*.

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American College of Sports Medicine Exercise Recommendations for Cancer Patients

Flexibility

- **Frequency:** ≥ 2-3 days/wk (daily and before and after exercising most effective)
- **Intensity:** Move through ROM as tolerated -all major muscle groups
- **Duration:** 10-30s per stretch (statically)
- **Progression:** As tolerated
- **Mode:** Stretching, yoga
- **Goals:** Increase flexibility and ROM
- **Special considerations:**

* Following approval from surgeon, special attention should be given to shoulder mobility stretches in breast cancer survivors

American College of Sports Medicine,, In Riebe, D., In Ehrman, J. K., In Liguori, G., & In Magal, M. (2018). *ACSM's guidelines for exercise testing and prescription*.

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EXERCISE SNACK #3

SEATED PENGUINS

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How is Exercise Beneficial for Cancer Patients?

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Effects of Exercise on Health-Related Outcomes in Those with Cancer

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Outcome	Aerobic Only	Resistance Only	Combination (Aerobic + Resistance)
Strong Evidence	Dose	Dose	Dose
Cancer-related fatigue	**3x**/week for **30** min per session of moderate intensity	**2x**/week of **2** sets of **12-15** reps for major muscle groups at moderate intensity	**3x**/week for **30** min per session of moderate aerobic exercise, plus **2x**/week of resistance training **2** sets of **12-15** reps for major muscle groups at moderate intensity
Health-related quality of life	**2-3x**/week for **30-60** min per session of moderate to vigorous	**2x**/week of **2** sets of **8-15** reps for major muscle groups at a moderate to vigorous intensity	**2-3x**/week for **20-30** min per session of moderate aerobic exercise plus **2x**/week of resistance training **2** sets of **8-15** reps for major muscle groups at moderate to vigorous intensity
Physical Function	**3x**/week for **30-60** min per session of moderate to vigorous	**2-3x**/week of **2** sets of **8-12** reps for major muscle groups at moderate to vigorous intensity	**3x**/week for **20-40** min per session of moderate to vigorous aerobic exercise, plus **2-3x**/week of resistance training **2** sets of **8-12** reps for major muscle group at moderate to vigorous intensity
Anxiety	**3x**/week for **30-60** min per session of moderate to vigorous	Insufficient evidence	**2-3x**/week for **20-40** min of moderate to vigorous aerobic exercise plus **2x**/week of resistance training of **2** sets, **8-12** reps for major muscle groups at moderate to vigorous intensity
Depression	**3x**/week for **30-60** min per session of moderate to vigorous	Insufficient evidence	**2-3x**/week for **20-40** min of moderate to vigorous aerobic exercise plus **2x**/week of resistance training of **2** sets, **8-12** reps for major muscle groups at moderate to vigorous intensity
Lymphedema	Insufficient evidence	**2-3x**/week of progressive, supervised, program for major muscle groups does not exacerbate lymphedema	Insufficient evidence

Exercise is Medicine® | AMERICAN COLLEGE of SPORTS MEDICINE

bit.ly/cancer_exercise_guidelines

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Effects of Exercise on Health-Related Outcomes in Those with Cancer

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Moderate Evidence			
Bone health	Insufficient evidence	**2-3x**/week of moderate to vigorous resistance training plus high impact training (sufficient to generate ground reaction force of **3-4** time body weight) for at least **12** months	Insufficient evidence
Sleep	**3-4x**/week for **30-40** min per session of moderate intensity	Insufficient evidence	Insufficient evidence

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bit.ly/cancer_exercise_guidelines

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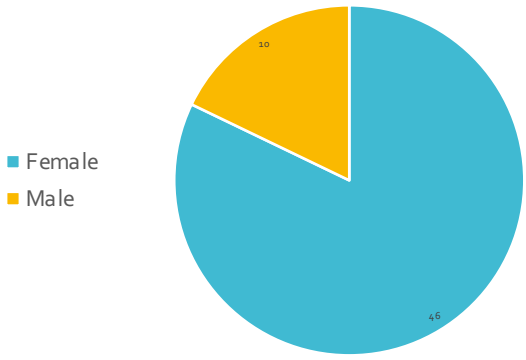
LiveFit Cancer Exercise Program

Gender Enrollment



- Existed since 2012
- Served ~60 patients
- Average age: 58
- Average number of sessions attended: 12

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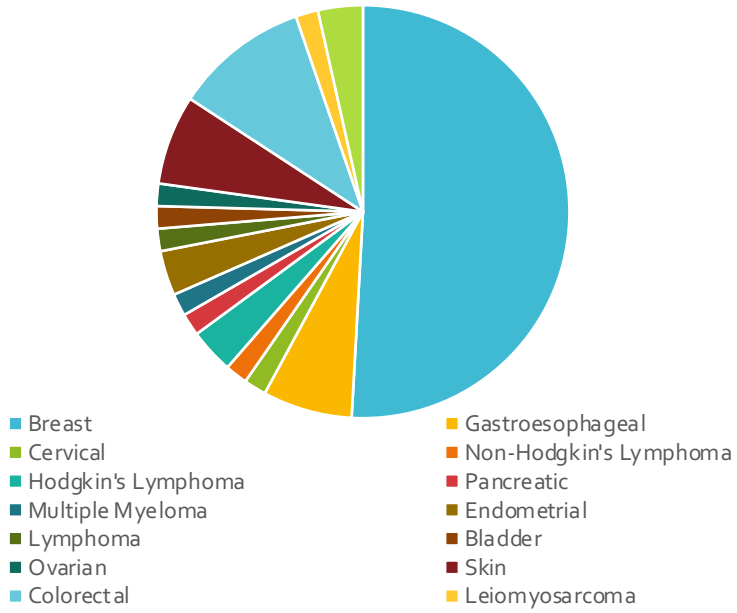
LiveFit Cancer Exercise Program

Types of Cancer



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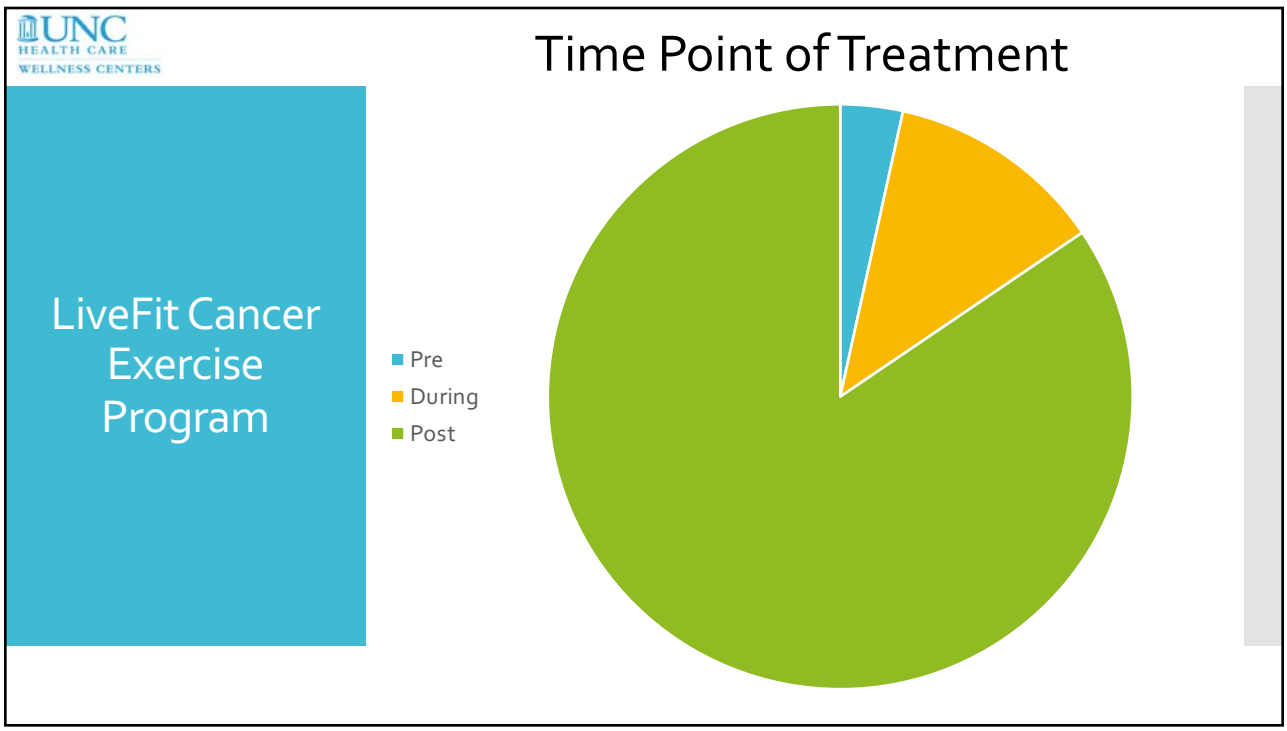
LiveFit Cancer Exercise Program



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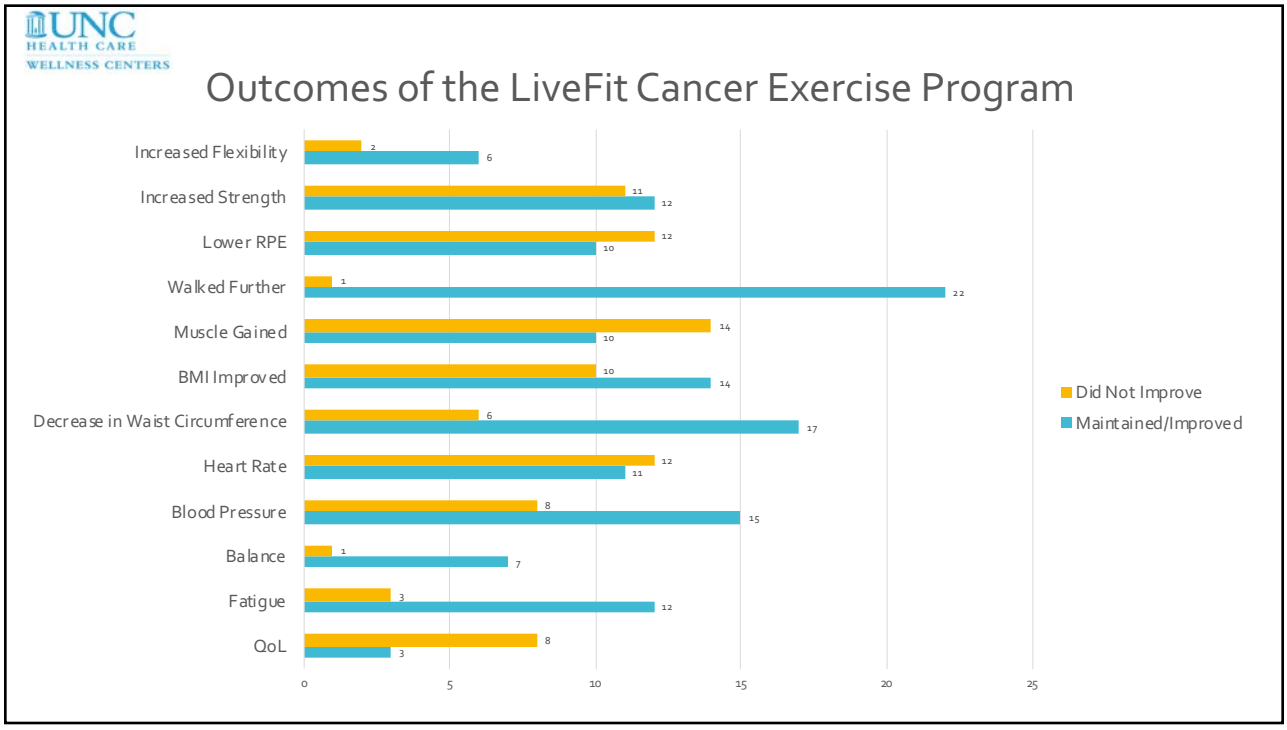

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What Can You Do?

Assess- Are patients physically active?

Advise- Patients to safely increase physical activity

Refer- Patients to cancer exercise trainer or appropriate exercise programming, based on current activity levels, medical status, and preferences

Schmitz KH, Campbell AM, Stuiver MM, et al. Exercise is medicine in oncology: Engaging clinicians to help patients move through cancer. *CA: A Cancer Journal for Clinicians*. 2019;69(6):468-484. doi:10.3322/caac.21579.

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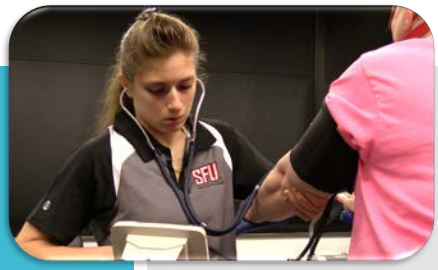

Questions?

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