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CURRENT GUIDELINES

MODULE 8

Module 8:

LEARNING OUTCOMES

1. Distinguish different goals depending on where your client is on the cancer trajectory.

2. Identify the principles of exercise prescription with reference to FITT and how they should be applied to PLWBC.

3. State the FITT recommendations during cancer treatment for cardiorespiratory, muscle strength and endurance and flexibility.

4. State the FITT recommendations post treatment for cardiorespiratory, muscle strength and endurance and flexibility.

5. Design programs with exercise adaptation, progressions and regressions for someone affected by cancer.

6. Identify the evidence-based FITT recommendations for specific outcomes (*e.g.*, fatigue, lymphedema).

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Module 8: Online Resources

Nutrition and Physical Activity Guidelines for Cancer Survivors

https://www.cancer.org/cancer/survivorship/be-healthy-after-treatment/physical-activity-and-the-cancer-patient.html

Relevant Research Papers

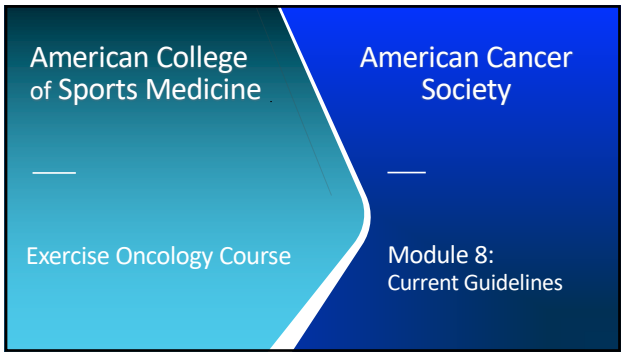
- Campbell, K. L., K. M. Winters-Stone, J. Wiskemann, A. M. May, A. L. Schwartz, K. S. Courneya, D. S. Zucker, C. E. Matthews, J. A. Ligibel, L. H. Gerber, G. S. Morris, A. V. Patel, T. F. Hue, F. M. Perna, and K. H. Schmitz. 2019. '**Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable**', Medicine and Science in Sports and Exercise, 51: 2375-90.

- Hayes, S. C., R. U. Newton, R. R. Spence, and D. A. Galvao. 2019. '**The Exercise and Sports Science Australia position statement: Exercise medicine in cancer management**', Journal of Science and Medicine in Sport, 22: 1175-99.

- Ligibel, J. A., K. Bohlke, A. M. May, S. K. Clinton, W. Demark-Wahnefried, S. C. Gilchrist, M. L. Irwin, M. Late, S. Mansfield, T. F. Marshall, J. A. Meyerhardt, C. A. Thomson, W. A. Wood, and C. M. Alfano. 2022. '**Exercise, Diet, and Weight Management During Cancer Treatment: ASCO Guideline**', Journal of Clinical Oncology, 40: 2491-507.

- '**Nutrition and Physical Activity Guideline for Cancer Survivors**'. 2022. CA: A Cancer Journal for Clinicians, 72: 263-65.

Module 8: PowerPoint Slides



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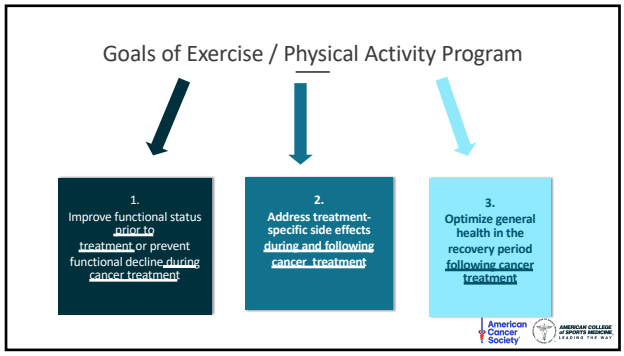

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Goals of PA Program **1**

Improve functional status prior to treatment or prevent/attenuate functional decline during treatment:

- Maintain/optimize cardiorespiratory function
- Maintain/optimize muscle mass (lean body mass) and strength
- Maintain joint range of motion/muscle/connective tissue length
- During treatment – the goal may be to lessen the decline in functioning

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Goals of PA Program **2**

Address treatment-induced impairments during and following treatment: (go through the complete list for all treatments)

- Fatigue
- Muscular weakness
- Cardiorespiratory fitness
- Limited ROM/Balance
- Lymphedema
- Quality of Life/Wellbeing
- Depression/Anxiety
- Deficits in joint range of motion
- Chemotherapy-induced Peripheral Neuropathy (CIPN)
- Self-efficacy (Confidence)
- Bone: osteopenia, osteoporosis
- Steroid-induced cardiomyopathy

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Goals of PA Program **3**

Optimize general health in the recovery period following cancer treatment:

- Improve physical functioning
- Improve cardiorespiratory fitness
- Improve body composition:
  - reduce fat mass, increase lean body mass
  - maintain bone health
- Improve muscular strength
- Improve muscular endurance
- Improve flexibility
- General health promotion

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Current Guidelines for exercise prescription with cancer survivors

But… is it safe?

Exercise is safe both during and after most types of cancer treatment.

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Activity Recommendations

- Exercise can be safely performed during and after cancer treatment if individual limitations are considered.
- All cancer survivors, including those with existing disease or who are undergoing difficult treatments, should be encouraged, at a minimum, to avoid being sedentary.
- Unless advised otherwise, follow the physical activity guidelines provided for the general population.

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Core Components of Exercise Prescription: Mode

- Choose aerobic, resistance, flexibility mode determined by client's needs and goals
- Early stages of exercise with deconditioned clients – patient preferences and resources must be considered
  - Aerobic options
  - Resistance options
  - Flexibility options
- Very frail or end-of-life clients
- Risk vs benefit

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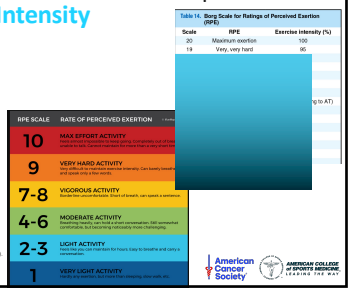
Core Components of Exercise Prescription: Intensity

- Low, moderate or high option
- Help clients understand intensity
- Different intensity sessions *e.g.*,
  - Interval training
  - Impact loading
  - Explosive, dynamic training
  - Hi lo



Paternostro Bayles, M. 2024. *ACSM's Exercise Testing and Prescription* (Wolters Kluwer). https://maximizepotentialllc.com/uncategorized/the-rating-of-perceived-exertion-rpe-scale

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Core Components of Exercise Prescription: Frequency and Duration / Total Exercise Dosage/Volume

- Duration of an exercise session will influence frequency of sessions per week
- Deconditioned patients – 2 to 10 min short bouts ⇨ 20 mins
- Why 20 minutes?
- Total exercise dosage:
  - Over a defined period
  - Use initial assessment of current exercise to determine dose
  - Some clients will never reach recommended dose
  - Weekly dosage and periodization
  - Flexibility of dose during active treatment

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Core Components of Exercise Prescription: Progression

- Depends on stage of treatment – pre, during or post
- Progression is not always linear
- Post treatment with curative intent
- Goal of progression
  - Regular exercisers
  - Overtraining
  - Sedentary clients

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Weekly Exercise Prescription FITT Guidelines

- Mode: Aerobic, resistance and flexibility
- Intensity – aim for at least moderate intensity
- Frequency and duration – accrued depending on patient driven goals and exercise consideration

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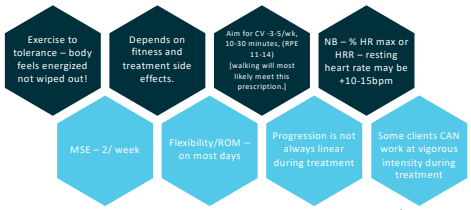
Current Guidelines – FITT DURING Cancer Treatment
(Surgery, Chemotherapy and Radiation Therapy)



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Recommendations Post Treatment

- Individualize the program based on information gathered from exercise testing.
- Consider needs, goals and exercise preferences of the survivor.
- Identify any potential barriers to exercise including long-term treatment and disease-related side effects that may compromise ability to exercise.

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Recommendations Post Treatment

- Consider the principles of exercise prescription: Specificity, Progression, Overload, Reversibility and Tedium (SPORT).
- Set prescription variables for components of exercise program (*e.g.*, frequency, intensity, type and time - FITT).
- Re-evaluate and modify program to address changes in medical status, physical fitness and functioning and consider new goals (progression and regression).

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ACSM Guidelines for Early-Stage Cancer Patients And Survivors Post Treatment

Aerobic Exercise

Type: Exercises involving large muscle groups, *e.g.*, walking, because they are safe and tolerable for patients. As function and fitness improves, variations in aerobic mode will probably be needed to achieve physiological and functional benefits.

Frequency: At least 3-5 times/wk, but daily exercise may be preferable for deconditioned patients who do lighter intensity and shorter duration exercises.

Intensity: Moderate, depending on current fitness level and medical treatments. Guidelines recommend intensity, *e.g.*, 40% to 60% HR reserve, 50% to 70% HR max, or an RPE of 11 to 14. If low intensity is preferred, total duration may need to be extended.

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ACSM Guidelines for Early-Stage Cancer Patients And Survivors Post Treatment

Aerobic Exercise

Duration: At least 20-30 min of continuous exercise; however, deconditioned patients or those experiencing severe side effects of treatment may need to combine short exercise bouts (*e.g.*, 3-5 min) with long rest intervals.

Progression: Patients should meet frequency and duration goals before they increase exercise intensity. Progression should be excluded for those who are experiencing severe side effects of treatment or slower and should be more gradual for deconditioned patients.

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ACSM Guidelines for Early-Stage Cancer Patients And Survivors Post Treatment

Resistance Exercise

Mode:

Dynamic exercises using concentric and eccentric muscle contractions or combination of dynamic and isometric exercises. Use machine weights, free weights, body weight and / or resistance bands that involve major lower and upper body muscle groups and / or exercises that target specific muscle groups adversely influenced by treatment and now affecting ADL.

Frequency: 2-3 days/week

- Min of 48 hours between sessions or exercising same muscle group
- Duration – ≥1 set, ≥8 reps per set, ≥60s rest between sets

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ACSM Guidelines for Early-Stage Cancer Patients And Survivors Post Treatment

Resistance Exercise

Intensity:

- 60%-80% 1RM or allow for 6-15 reps. Increase weight when reps ≥ 15
- 8-10 exercises of major muscle groups; machines or free weights
- Min of one set of 8-12 reps of all the major muscles groups
- For beginners start with increasing reps rather than resistance
- Start with long recovery rest times between exercises sets and sessions
- When / if performing > sessions per week, split programming to accommodate necessary rest period. Moderate to high intensity is recommended with high-volume load (sets x reps x load) to optimize muscle hypertrophy

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ACSM Guidelines for Early-Stage Cancer Patients and Survivors Post Treatment

Flexibility / ROM Exercise

- Set of exercises to progressively increase ROM in a joint or lengthen shortened muscles
- Exercises should meet the needs of the individual – stretching up, putting on socks
- Address cancer treatment deficits (surgery, stiff joints)

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ACSM Guidelines for Early-Stage Cancer Patients and Survivors Post Treatment

Flexibility / ROM Exercise

- 2-3 days / week up to daily
- Intensity – stretch within limits of pain to the point of tightness or slight discomfort
- Hold each stretch for 10-30 seconds
- Static stretches (passive and/or active) for all major muscle tendon groups. Tai chi and yoga may be preferred.

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Progression, Periodization, Autoregulation

- FITT can be varied within a week, over time and over cycles
- Patients with no contraindications – progressive overload can occur. But take progression slower and more gradual for deconditioned patients or those who are at risk of exacerbating or developing treatment-related side effects such as lymphedema, fatigue, and nausea. Doing too much brings risk of disengagement or injury.
- FITT flexible to allow autoregulation based on cancer specific considerations

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Stage of Treatment and Approach to Progression

Stage of treatment	Approach to progression	Considerations
Prehab	Linear	Aim is to improve CRF
Post surgery period	Increasing ADLs	Need to ensure full healing FITT as tolerated
Active treatment (Ch/RT)	As tolerated, non-linear approach	FITT as tolerated
Ongoing (maintenance) treatment (HT/TT/BT)	Linear approach	Consider SEs and consequences of completed active treatment and potential future issues
Completed treatment	Linear approach	Consider ongoing consequences and potential future issues
Advanced/palliative	As tolerated, maintenance or linear depending on responses to treatment and fitness level	Prioritize quality of life FITT as tolerated

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Formative Assessment

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New Guidelines for SPECIFIC Health Outcomes

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

What can exercise do?

- **Prevention of 7 common cancers***
  Dose: Meet 2018 Physical Activity Guidelines for Americans: 150-300 min/week moderate or 75-150 min/week vigorous aerobic exercise.
- **Survival of 3 common cancers****
  Dose: Exact dose of physical activity needed to reduce cancer-specific or all-cause mortality is not yet known; Overall more activity appears to lead to better risk reduction

*Strokes: breast, colon, endometrial, esophageal, kidney and stomach cancers
**Breast, colon and prostate cancers

Overall, avoid inactivity, and to improve general health, aim to achieve the current physical activity guidelines for health (150 min/week aerobic exercise and 2x/week strength training).

Outcome	Aerobic Only	Resistance Only	Combination (Aerobic + Resistance)
Strong Evidence	Dose	Dose	Dose
Cancer-related fatigue	2x/week for **30** min per session of moderate intensity	2x/week of **2** sets of **10-15** 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	3-5x/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	3-5x/week for **30-90** 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	2x/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 **30-60** 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	3-5x/week for **30-60** 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	3-5x/week for **30-60** 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
Moderate Evidence			
Bone health	Insufficient evidence	2-3x/week of moderate to vigorous resistance training plus high impact training (sufficient to generate ground reaction forces of **2-4** time body weight) for at least **12** months	Insufficient evidence
Sleep	3-4x/week for **20-40** min per session of moderate intensity	Insufficient evidence	Insufficient evidence

Citation: bit.ly/cancer_exercise_guidelines

Moderate intensity (40%-59% heart rate reserve or VO2R) to vigorous intensity (60%-89% heart rate reserve or VO2R) is recommended.

Exercise is Medicine

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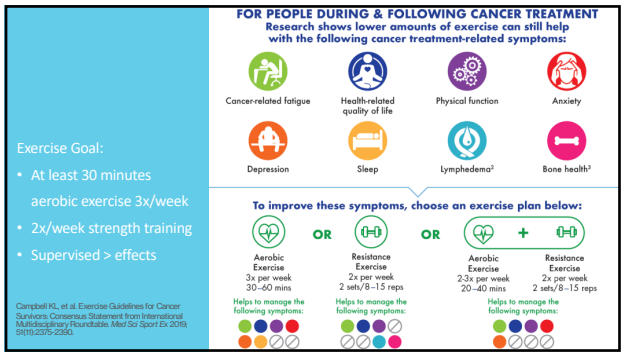
Exercise Goal:
• At least 30 minutes aerobic exercise 3x/week
• 2x/week strength training
• Supervised > effects
Campbell KL, et al. Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. Med Sci Sport Ex. 2019; 51(11):2375-2390.
FOR PEOPLE DURING & FOLLOWING CANCER TREATMENT
Research shows lower amounts of exercise can still help with the following cancer treatment-related symptoms:
Cancer-related fatigue
Health-related quality of life
Physical function
Anxiety
Depression
Sleep
Lymphedema²
Bone health³
To improve these symptoms, choose an exercise plan below:
Aerobic Exercise 3x per week 30–60 mins
OR
Resistance Exercise 2x per week 2 sets/8–15 reps
OR
Aerobic Exercise 2-3x per week 20–40 mins
+
Resistance Exercise 2x per week 2 sets/8–15 reps
Helps to manage the following symptoms:
Helps to manage the following symptoms:
Helps to manage the following symptoms:

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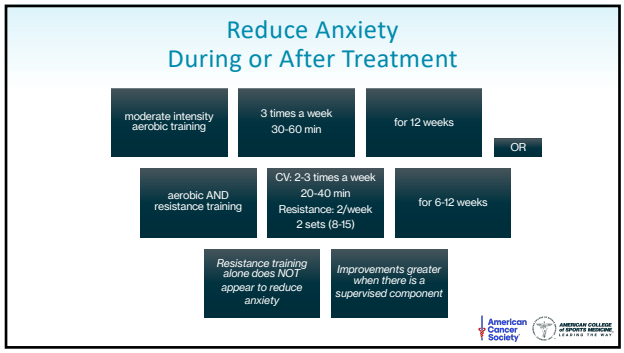
Reduce Anxiety
During or After Treatment
moderate intensity aerobic training
3 times a week 30-60 min
for 12 weeks
OR
aerobic AND resistance training
CV: 2-3 times a week 20-40 min Resistance: 2/week 2 sets (8-15)
for 6-12 weeks
Resistance training alone does NOT appear to reduce anxiety
Improvements greater when there is a supervised component
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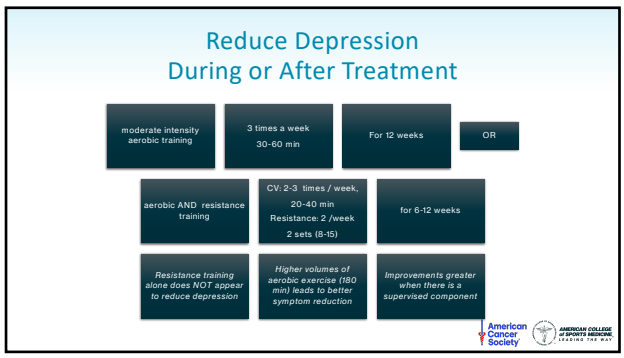
Reduce Depression
During or After Treatment
moderate intensity aerobic training
3 times a week 30-60 min
For 12 weeks
OR
aerobic AND resistance training
CV: 2-3 times / week, 20-40 min Resistance: 2 /week 2 sets (8-15)
for 6-12 weeks
Resistance training alone does NOT appear to reduce depression
Higher volumes of aerobic exercise (180 min) leads to better symptom reduction
Improvements greater when there is a supervised component
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Reduce Fatigue During or After Treatment

moderate intensity aerobic training	3 times a week 30-60 min	for 12 weeks
OR	aerobic AND resistance training	2-3 times a week
OR	moderate intensity resistance training 2/week 2 sets (8-15 reps)	This is particularly beneficial in prostate cancer

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How Exercise Helps…

1. To regain and improve physical function, aerobic capacity, strength and flexibility.
2. To improve body image and QOL.
3. To improve body composition.
4. To improve cardiorespiratory, endocrine, neurological, muscular, cognitive and psychosocial outcomes.
5. Potentially, to reduce or delay recurrence or second primary cancer.
6. To improve the ability to physically and psychologically withstand the ongoing anxiety regarding recurrence or a second primary cancer.
7. To reduce and prevent long-term and late effects of cancer treatment.
8. To improve the physiological and psychological ability to withstand any current or future cancer treatments.

These goals will vary according to where the survivor is in the continuum of cancer experience.

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Formative Assessment

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