

# MODULE 5








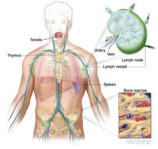


## EXERCISE IS MEDICINE



### Just like nutrition, exercise is also very important!

The lecture accompanying this module will explain the importance of exercise during and after your cancer recovery.

At Maple Tree, we fully believe that *Exercise is Medicine*, and that if you choose to make exercise a standard part of your care, you will thrive through cancer!

<p><b>The Role of Exercise in Cancer Recovery</b></p> <p>Maple Tree Cancer Alliance</p> 	<p><b>Definition</b></p> <p>Exercise: activity requiring physical effort, carried out to sustain or improve health and fitness.</p> <p>Physical Activity: bodily movement produced by skeletal muscles that requires energy expenditure.</p> 	<p><b>Physical Activity and Exercise After a Cancer Diagnosis</b></p> <p>Less than 5% of cancer survivors are active during their primary treatments</p> <p>Approximately 20% will be active after they recover from treatments</p> <p><small>Courtesy: K. Ravinich, K. Wilmore, J.K. Exercise motivation and behavior change. In: Fouadstain M, ed. Handbook of Clinical</small></p> 
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<p><b>Physical Activity and Exercise After a Cancer Diagnosis</b></p> <p><b>Psychological barriers contributing to decreased activity</b></p> <ul style="list-style-type: none"> <li>• Fatigue</li> <li>• Pain</li> <li>• Motivation</li> </ul> <p><a href="https://meetinglibrary.asco.org/record/139878/abstract">https://meetinglibrary.asco.org/record/139878/abstract</a></p> 	<p><b>Exercise Recommendations</b></p> <ul style="list-style-type: none"> <li>• 150 minutes per week of moderate intensity</li> <li>• 75 minutes per week of vigorous intensity aerobic physical activity <ul style="list-style-type: none"> <li>— Or equivalent of combination of moderate and vigorous intensity aerobic physical activity</li> </ul> </li> <li>• Muscle-strengthening activities involving all major muscle groups at least 2 days per week</li> </ul>	<p><b>Cancer Treatments</b></p> <ul style="list-style-type: none"> <li>• Surgery</li> <li>• Systemic Therapy</li> <li>• Radiation</li> </ul>  
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<p><b>Cancer Treatment-Related Side Effects</b></p> <ul style="list-style-type: none"> <li>• Cancer treatments can cause physiological and psychological side effects.</li> <li>• Toxicities are dependent on choice of therapy, cumulative dose, patient's tolerance and co-morbidities.</li> </ul> 	<p><b>System Toxicities From Cancer Treatment</b></p> <ul style="list-style-type: none"> <li>• Gastrointestinal system</li> <li>• Immune system</li> <li>• Musculoskeletal alterations</li> <li>• Neurotoxic</li> <li>• Pulmonary</li> <li>• Cardiovascular</li> <li>• Hepatic and Nephrotoxicity</li> <li>• Cytotoxic</li> </ul>  	<p><b>Efficacy of Exercise on Toxicities</b></p> <p><b>Gastrointestinal System</b></p> <ul style="list-style-type: none"> <li>• Increase the uptake of nutrients</li> <li>• Decrease weakness</li> <li>• Decrease fatigue</li> <li>• Increase appetite</li> </ul> <p><b>Immune System</b></p> <ul style="list-style-type: none"> <li>• Increases the production of macrophages</li> <li>• Increased circulation of cells that promote immunity</li> <li>• Increased body temperature</li> </ul> 
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## Efficacy of Exercise on Toxicities

### Musculoskeletal

- Increases muscle tissue
- Increases muscle cell growth
- Improves metabolism

### Neurological

- Enhance motor unit recruitment
- Improves neurochemical availability at the cellular tissue levels



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## Efficacy of Exercise on Toxicities

### Pulmonary

- Improves ventilation and transport of oxygen

### Cardiovascular

- Strengthens the myocardium
- Increases cardiac output and stroke volume
- Decreases resting heart rate and lowers exercise heart rate



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## Efficacy of Exercise on Toxicities

### Hepatic and Renal Systems

- Improves the blood perfusion of these organs
- Increases transport of metabolites.

### Cellular functioning

- Increase RBC production
- Increase blood volume
- Increase in hemoglobin concentration



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## Exercise and Late and Long-term Effects

- Lymphedema
- Cancer related fatigue
- Depression
- Anxiety
- Cognitive impairments
- Cardiovascular fitness
- Balance
- Strength
- Bone Strength
- Self Esteem
- Physical, functional and emotional quality of life



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## National Averages

- Approximately 95% of patients experience negative side effects of cancer and its associated treatments.
- Of these, less than 5% are ever referred to exercise oncology.

Smith SR, Zheng JY. The Intersection of Oncology Progress and Cancer Rehabilitation. Curr Phys Med Rehabil Rep (2017) 5:46-54.



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## Exercise and Cancer Recovery



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## Benefits of Exercise During Cancer Care

- Mitigation of cancer treatment effects
- Survivor control
- Improve treatment completion rates
- Reduced risk factors
- Decrease recurrence rates
- Improve overall survivorship
- Decrease cost of healthcare



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## Exercise Safety Considerations

- Medical clearance and care coordination
- Certified exercise professional
- Pre-exercise comprehensive assessment
- Vital sign monitoring before, during and after



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## Exercise Safety Considerations

Exercise program modification for survivors with multiple or uncontrolled comorbidities or system compromise, including but not limited to:

- Bone metastases
- Thrombocytopenia
- Anemia
- Fever or active infection
- Limitations secondary to metastases or comorbidity
- Fall risk
- Lymphedema



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## Qualifications for Professionals in Exercise Oncology

- Exercise Physiologists
  - Baccalaureate Degree
  - Certification in Exercise Oncology



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## Components of an Exercise Program

- Fitness Assessment
- Exercise Prescription
- Exercise Program
- Re-evaluations



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## Pre-Screening

- Physician Referral
- Informed Consent
- Health History Questionnaires
- Cancer History Questionnaires
- Psychological Questionnaires
- Medical Evaluation



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## Before Exercise

### Normal Vital Sign Ranges

- Heart Rate
  - 60 to 100 beats per minute
- Respiratory Rate
  - 12 to 18 breaths per minute.
- Blood Pressure
  - 90/60 mm Hg to 120/80 mm Hg
- Temperature
  - 97.8 to 99.1 degrees F
- Oxygen Saturation
  - 95 to 100 percent
  - 90% is considered low



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## Fitness Assessment

- Body Composition
- Cardiovascular Endurance
- Muscular Strength
- Muscular Endurance
- Flexibility/Range of Motion



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## Oncology Exercise Prescription


- Goal Setting
- Program Planning
- Determining
  - Frequency
  - Intensity
  - Time
  - Type



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### Oncology Exercise Programming

- Individualized according to the patient's health status and goals
- All sessions are completed one-on-one with a Certified Cancer Exercise Trainer




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### Mode of Exercise

- Cardiorespiratory Endurance:**
  - Walking, cycling, cross trainers
- Muscular Strength/Endurance:**
  - Free weights and machines, resistance balls, resistance bands
- Body Composition:**
  - Aerobic and resistance exercise
- Flexibility:**
  - Stretching exercises, ROM wheels, pulleys, wall stretching
- Neuromuscular Tension/Stress:**
  - Progressive relaxation, Tai Chi, Yoga

RMCRE Assessment Manual, 2006

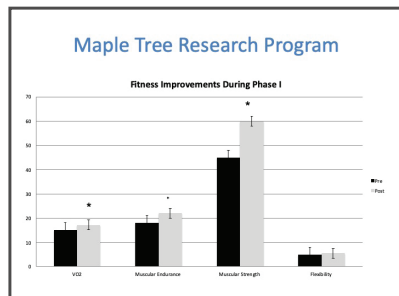


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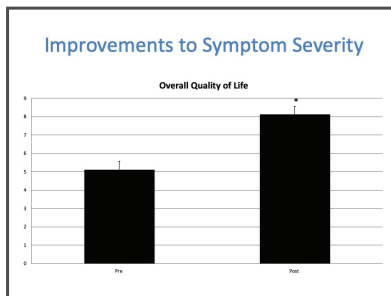
### Maple Tree Cancer Alliance Research on Exercise Oncology Efficacy



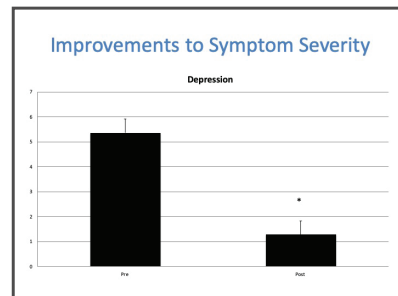

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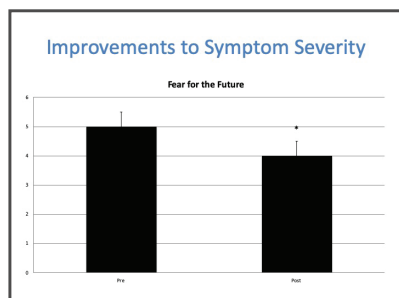
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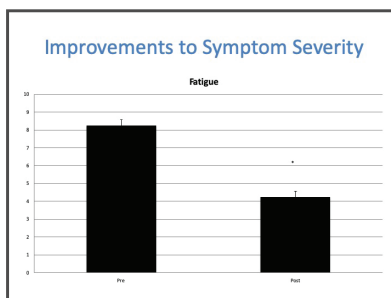
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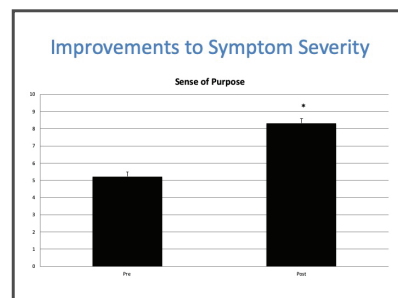
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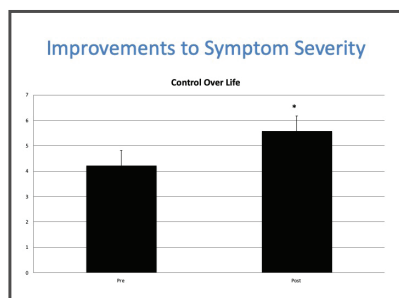
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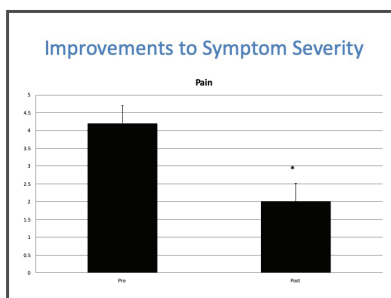
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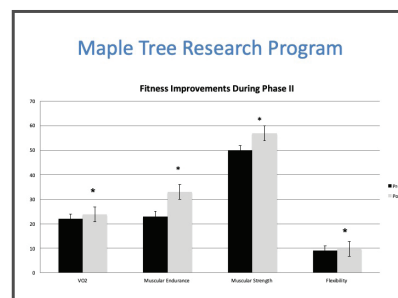
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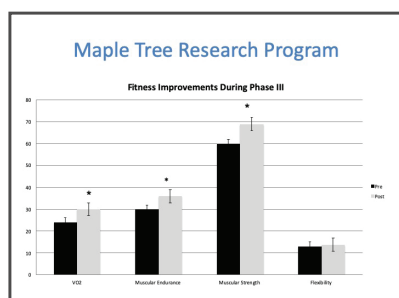
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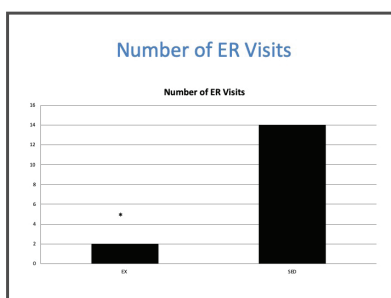
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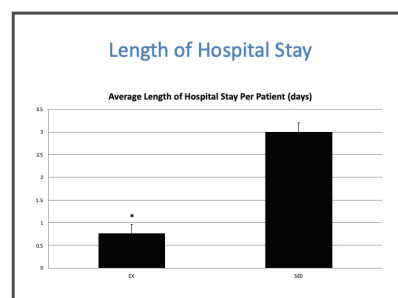
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### Summary

- Exercise is safe and effective during cancer treatment and should be an integral component of cancer recovery.
- This exercise oncology program must be individualized to the patient and carried out by a certified exercise professional, in coordination with the patient's medical care team.

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