Cancer and Exercise: How to start and stay working out

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Objectives

- Physical changes in people with cancer
- Positive effects of exercise
- Different types of exercise and programs
- How to start an exercise program
- How to stay motivated to exercise through difficulties
In 2016, an estimated 1,685,210 new cases of cancer will be diagnosed in US.

14.5 million survivors in 2014 and estimated it will rise to 19 million by 2024.

$125 billion dollars spent on cancer care in 2010 and expected to rise to 156 billion in 2020.
Side effects of cancer and treatment

- Neuromuscular fatigue
- Muscle loss
- Chemo brain
- Cancer related fatigue
- Sleep disturbances
- Muscle and bone pain
- Cardiomyopathy
- Weight gain
70% of patients experience “fatigue” during chemo and radiation

30% of cancer survivors say this fatigue is persistent for years after treatment

This fatigue not only affects activities of daily living but can also have economic and social affects as well.
Types of fatigue

- Mental: lack of concentration and loss of memory
- Volitional: inability to begin task OR tendency to avoid social contacts and activities
- Physical: tiredness and easy exhaustion from activities requiring physical activity
"It is exercise alone that supports the spirit, and keeps the mind in vigor"

-Cicero (106 BC-43 BC) Philosopher
First seen in a study in 1983 with BrCa- Winningham.
  * 10 wk study with arm bike for 30 min, 3x/wk.
  * Substantial increase in physical performance with those who trained vs those who did not.

Continued research (Winningham, MacVicar, et al.) showed improvements in mood disturbances, somatic complaints, total body weight, and body fat percentage, and increase in maximal physical performance.
Benefits of Exercise

- “Physical activity produces adaptive changes such as gains in muscle mass and plasma volume, improved lung ventilation and perfusion, increased cardiac reserve, and a higher concentration of oxidative muscle enzymes.”
- Resistance exercises have been shown to reduce the loss of muscle mass related to corticoid treatment.
Benefits of Exercise

- Weight management
- Improves fatigue
- Increased endorphins
- Reduces risk of recurrence
- Improves Quality of Life
- Decreases missed days of work
- Decreases anxiety, depression
- Improves sleep
Cancer Rehabilitation

Cancer Diagnosis → PRE Habilitation → Cancer Treatment → Impairments

Impairments → NO Impairments

NO Impairments → Rehabilitation

Rehabilitation → General Exercise/Wellness Program

Under the supervision of a clinically trained professional

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After the period of cancer diagnosis and before active treatments begin
- Assessments to obtain a baseline functional level
- Identifies impairments
- Targets interventions to improve health for maximal health prior to treatments.
Rehabilitation

* After treatment when there are marked impairments noted in:
  * Energy level
  * Peripheral neuropathy
  * Pain
  * Functional movement limitations
  * Cognitive deficits
  * Swelling
Rehabilitation

- Sub-acute facility
- Outpatient facility

- Physical Therapy
- Occupational Therapy
- Speech and Language Therapy
- Cognitive Therapy
General Wellness Program

* When there is no impairment after cancer treatment, OR you’ve been cleared of previous impairments and are ready to advance physical activity
* Completed out in the community
* Can be done with the support of specialty trained personal trainers
  * ACS Cancer Specialist
  * CETI (Cancer Exercise Training Institute)
Types of Exercise

* Aerobic
* Anaerobic
* Strength training
* Stretching
* Interval training
Aerobic:

- Cardio exercise
- Physical exercise of low to high intensity that depends primarily on the aerobic energy-generating process. This uses oxygen to adequately meet energy demands during exercise via aerobic metabolism and can be sustained for extended periods of time.
- Examples: running, swimming, cycling, walking
Types of Exercise

* Aerobic Benefits:
  * Strengthens muscles for respiration
  * Strengthens heart muscle
  * Improves circulation
  * Increased red blood cells and transport of oxygen
  * Improved mental health
  * Stimulate bone growth (high-impact aerobic exercises)
  * Neurobiological effects
**Types of Exercise**

- **Anaerobic**
  - Resistance training
  - Intense physical exercise in short bursts or duration and causes lactate to form.
  - Aerobic exercise can become anaerobic when performed in excess of 90% maximal heart rate.

- **Benefits:**
  - Builds muscle, increased endurance and ability to fight fatigue, increased metabolism, lowers blood sugar

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“Strength training”

- Many different forms and methods to build muscle, improve function and mobility.
  - Classes at a local gym
  - Functional training
  - Kettle bells
  - Weight machines
  - Free weights
  - Crossfit
  - Exercise videos

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Types of Exercise

* Stretching
  * Exercises that are designed to improve the extensibility, flexibility and coordination of a muscle, tendon or joint.

* Types:
  * Static: holding a stretch for length of time
  * Dynamic: movement through range of the muscle
  * Ballistic: a bouncing motion during a stretch
  * Neuromuscular: resistance applied to facilitation movement

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Types of Exercise

- **Stretching**
  - Yoga:
    - Many different forms and methods
    - Movement with periods of holding for stretch and flexibility
  - Qigong
    - “moving meditation”
    - Coordination of slow movements, deep breathing, and calm mind
  - Tia Chi
    - Movement training with slow movements that are rooting in self-defense and martial arts.
Interval training

- Exercise that consists of a series of low to high intensity exercises that are interspersed with periods of rest.
- High intensity is near anaerobic levels while the low intensity is easier and closer to aerobic levels.

Benefits:

- Exercises cardiovascular system
- Provides variation for improved motivation
- Helps manage type 2 Diabetes
Maximal Heart Rate
* 220-age.
* Ex: 36 yo female. 220-36 = 184 bpm

Target Heart Rate
* 70-85% of your Max HR.
* Ex: 36 yo female with MHR = 184
  * 184*.7 = 128.8
  * 184*.85 = 156.4
  * THR: 129-156 bpm
Exercise Guidelines

* 2009 ACSM Roundtable with other leading cancer organizations
* Guidelines:
  * 150 minutes/week of moderate-intense aerobic exercise OR 75 minutes/week of vigorous exercise
  * Strength training 2-3 times/week, 8-10 exercises of 10-15 reps/set
  * AVOID INACTIVITY
  * Return and continue normal daily activities
Effects of Aerobic and Resistance Exercise in Breast Cancer Patients Receiving Adjuvant Chemotherapy

- Courneya, KS; et al. 2007
- Multi-centered randomized controlled trial (2003-2005)
- 242 women.
  - 82: normal care
  - 82: supervised resistance exercise
  - 78: supervised aerobic exercise
- 9-24 weeks, for duration of chemotherapy treatment
Effects of Aerobic and Resistance Exercise in Breast Cancer Patients Receiving Adjuvant Chemotherapy

Aerobic group:
- 3 x week on a cycle ergometer, treadmill, or elliptical at 60% maximal oxygen (wks 1-6) then 70% (wks 7-12), and 80% (beyond 12 weeks)
- Duration: 15 min (wks 1-3) and then increased by 5 min every 3 weeks until duration reached 45 min at week 18.
Effects of Aerobic and Resistance Exercise in Breast Cancer Patients Receiving Adjuvant Chemotherapy

- Resistance Group
  - 3x/wk
  - 2 sets of 8-12 reps of 9 different exercises at 60-70% of their estimated 1-rep max.
  - Exercises progressed 10% when participants completed more than 12 reps.
Benefits of Aerobic & Resistance

- Effects of Aerobic and Resistance Exercise in Breast Cancer Patients Receiving Adjuvant Chemotherapy
  - Usual Care
    - Asked not to initiate an exercise program during chemo.
    - Was offered a 1-month exercise program after post-intervention assessments
Benefits of Aerobic & Resistance

Effects of Aerobic and Resistance Exercise in Breast Cancer Patients Receiving Adjuvant Chemotherapy

- Aerobic Improved:
  - Self esteem
  - Aerobic fitness
  - Percent body fat

- Resistance improved:
  - Self-esteem
  - Muscular strength
  - Lean body mass
  - Chemo completion rate

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Benefits of Yoga

* Multiple studies show:
  * Decreases blood pressure
  * Decreases pain center neural activity in the brain
  * Improves flexibility
  * Improves body awareness and balance
  * Decreases inflammation
  * Improves sleep
  * Reduces stress
A 3-week multimodal intervention involving high-intensity interval training in female cancer survivors

- Schmitt, J; et al. 2016
- 26 survivors who had completed chemotherapy
  - 13 in High intensity interval training (HIIT)
  - 13 in Low to moderate intensity exercise (LMIE)
- Both groups received mandatory nutrition, OT, social counseling, and relaxation training.
A 3-week multimodal intervention involving high-intensity interval training in female cancer survivors

**HIIT Program**
- 3 session per week (24 hrs in between)
- Out-door group session on paved up-hill road
- 5 min warm-up
- Eight 1-min sessions at >95%HR peak with 2 min intervals of slow walking as recovery.

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Benefits of Interval Training

- A 3-week multimodal intervention involving high-intensity interval training in female cancer survivors
  - LMIE Program
    - Outdoor group session on paved up-hill road
    - Six 75-min sessions of moderate intensity
      - 60 min walking outside
      - 15 min indoor cycling at 60%HR peak
A 3-week multimodal intervention involving high-intensity interval training in female cancer survivors

Results

- Improvements the same for both groups
- Improvements in work economy, QoL, cancer-related fatigue
- No change in body composition or energy expenditure
- Shorter time commitment for HIIT vs LMIE
Exercise Conclusions

- Exercise is beneficial for many of the secondary complaints that come from cancer and it’s necessary treatments.
- Aerobic training is good for improving cardiovascular strength and overall improvements with QoL and fatigue.
- Resistance training is good for building muscles and changing body composition.
- Interval training has shown to be safe with the same benefits with shorter training time required.
- Balanced program with aerobic conditioning, resistance training and stretching has total body benefits.

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“Those who do not find time for exercise will have to find time for illness.”

-Edward Stanley (Earl of Derby 1139)
How to start...

http://openwalls.com/image?id=18577
How to start...

- Obtain clearance from your medical team.
- Plan out where you are going to work out and with who
- Make appropriate goals for your current fitness level
- Know when to progress, back off, and see your medical provider

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Get clearance from medical professional if you have

* Compromised immune system
* Extreme fatigue
* Peripheral neuropathies
* Anemia
* Ataxia (difficulty coordinating muscles)
* Healing surgical sites
* Participating in radiation
* Uncontrolled HTN

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Where to workout

* At home
  * Home gym with equipment
  * Workout videos
* Workout facility
  * Do they have specialty trained personal trainers
    * CETI
    * ACS Cancer Specialist
* Community Center
When to see a medical professional

* Pain that lasts longer than 48 hours, without improvement or worsening
* New numbness or tingling that doesn’t improve
* Shortness of breath
* Increased blood pressure or heart rate at rest
* New swelling that is noted on the breast cancer side or in the ankles and feet
* Unexplained bruising
Goal Setting

* Know your current fitness level
  * Have you exercised in the past?
  * Or a beginner whose never been in a gym?
* Know what Resistances you have to working out
  * “I don’t like to sweat”
  * “I don’t like to workout in the morning/night”
  * “I have shoulder/back/knee injuries”
* Know your barriers
Make BEHAVIOR/HABIT goals

* You CAN’T control outcomes
* You CAN control the behaviors that will lead to the outcome you desire.

Behavior goals are:
* Things you do consistently and regularly
* Small, manageable tasks that are within your control
* Things that you can do right now, today, or in the near future
<table>
<thead>
<tr>
<th>Outcome Goal</th>
<th>Behavior Goal</th>
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</thead>
<tbody>
<tr>
<td>“I want to run a 5K in 25 minutes”</td>
<td>“I’m going to work out 5 times per week and build up my endurance and time running.”</td>
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<tr>
<td>“Lose 10 pounds”</td>
<td>“I’m going to make smart food choices when I’m tired and emotional”</td>
</tr>
<tr>
<td>“I want to be pain free.”</td>
<td>“I’m going to go to PT and the gym 4 times per week so I can stay fit and flexible”</td>
</tr>
<tr>
<td>“I want to be there when my daughter gets married”</td>
<td>“I’m going to stay present with my health and doctor visits”</td>
</tr>
<tr>
<td>“I want to be happy”</td>
<td>“I’m going to spend more time with people who make me laugh.”</td>
</tr>
</tbody>
</table>
“Eighty percent of success is showing up.”

-Woody Allen
Goal Setting

I want to:

This MONTH I will:

This WEEK I will:

TODAY I will:
Staying Motivated!

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Staying Motivated!

* It’s not about being PERFECT!!!
* You just have to be a little bit better....CONSISTENTLY
Staying Motivated!

- It’s not about being PERFECT!!!
- You just have to be a little bit better….CONSISTENTLY
- You don’t have to be the FASTEST when running from a bear

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* Research shows you stay motivated when you do the follow:
  * Identify what IS working and do more of it!
  * Look for your strengths, and figure out how to use them to your advantage
  * Find people who are strong and successful in this area and spend time with them or imitate them. Create an environment of success.
The “Trigger”
Can be a:

* word or quote
* Ritual
* Image
* Song
* Video

Use these triggers as motivation to exercise, calm down when stressed or stay present in current moment.

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Conclusions

* Make behavior goals vs outcome goals
* Strive for being better everyday, not being PERFECT
* Start where you are, and do what you can, everyday
* Set your environment and community for success.

Find your strength,
And use it!

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Questions?

Thank You!