Physical activity is a very important part of a healthy lifestyle and has been proven to benefit a person’s physical and psychological well-being. When people are diagnosed with cancer, many have an interest in changing their lifestyle in order to improve their prognosis and quality of life.

This course will:

- Teach you the benefits of physical activity and how to incorporate activity into your daily routine.
- Teach you how to measure your maximum heart rate and perceived exertion.
- Show you some simple ways to increase daily activity.

Check your knowledge about physical activity and exercise during cancer treatment.

- Check what you know about physical activity and cancer before you review this section.
- When you are done with this section, please complete this same test again. (A second copy and answers are located at the end of this section.)
- You will then be able to compare your answers and see how much you have learned.

Directions: Please select the answer (True or False) which you believe to be correct.

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
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The Benefits of Physical Activity and Exercise:

Cancer and its treatment can significantly decrease a person’s strength, endurance, energy level, and overall sense of well-being. These changes can negatively affect a person’s mood and quality of life. In general, it has been shown that physical activity and exercise can help to prevent these losses. In addition, physical activity and exercise can promote the release of endorphins which are natural brain chemicals which help improve mood.

For cancer patients, research studies have shown that physical activity and exercise can improve energy levels, improve strength and endurance, and reduce fatigue during and after treatment. Other studies have demonstrated that exercise can decrease the risk of recurrence of certain cancers. New research is trying to determine if physical activity and exercise actually decrease the tumor size and help fight the cancer. This all sounds great, right? But the hardest part is making sure that a person stays active, even when they are feeling poorly.
What’s the difference between physical activity and exercise?

The answer is: not much. Whatever gets your heart rate up and causes you to breathe harder for a sustained period of time counts as aerobic exercise. This includes daily chores (vacuuming, mowing the lawn, etc.) or standard exercise (walking, biking, etc.). Below are the guidelines from both the American Cancer Society and the American College of Sports Medicine regarding recommendations on exercise in people with cancer from 2012.

American Cancer Society and American College of Sports Medicine Exercise Recommendations

<table>
<thead>
<tr>
<th>CANCER EXERCISE GUIDELINES: AVOID INACTIVITY</th>
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<tr>
<td>Consult with your doctor before starting any exercise program. Begin exercising as soon as possible following surgery or other phases of cancer treatment. Continue normal daily activities and exercise as much as possible during and after non-surgical treatments. Do whatever is possible, and work towards meeting the recommended amount.</td>
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<tr>
<td><strong>AEROBIC EXERCISE</strong> = Perform 150 minutes per week of moderately-intense activity (progress by increasing time and intensity) or 75 minutes per week of vigorous exercise.</td>
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<tr>
<td><strong>STRENGTH TRAINING</strong> = Perform 2-3 weekly sessions that include exercise for major muscle groups: 8-10 exercises of 10-15 repetitions/set, at least one set per session. Major muscle groups include chest, back, arms, shoulders, abdominals, gluteals, quadriceps, hamstring, and calf.</td>
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<tr>
<td><strong>FLEXIBILITY/RANGE OF MOTION</strong> = Every day (flexion, extension, lateral movements, and rotation), still focusing on the major muscle groups and joints. And don’t forget about the spine!</td>
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How intense does the physical activity have to be?

Many people ask: “What is light versus moderate versus intense activity?”
In the following pages we are going to discuss two ways to determine the intensity of your activity. The first is calculating your maximum heart rate. Your heart rate is just the number of times your heart beats per minute.

First check your actual heart rate by: Place the tips of your first two fingers (Don’t use your thumb) over the blood vessels in your neck, just to the side of your Adam’s apple. Count your pulse over a period of 30 seconds and then multiply by two. This is your heart rate. Many people teach themselves how to do this while resting and work up to checking right after exercising.

How to calculate your maximum heart rate:
Maximum heart rate is the fastest that your heart should be able to beat. You do not want to actually get to this though.

1. To calculate Maximum Heart Rate use the formula:
   \[220 - \text{(your age)} = X \text{ beats per minute (Maximum Heart Rate)}\]
   Example: for a 50 year old person - 220 – 50 = 170 for the maximum heart rate

2. For moderate intensity exercise, your heart rate should be 50-70% of the maximum heart rate.
   Example for the same 50 year old person:
   50% intensity = 170 x 0.50 = 85 beats per minute
   70% intensity = 170 x 0.70 = 119 beats per minute (moderate intensity goal is 85-119)

3. For vigorous intensity exercise, your heart should be 70-85% of the maximum heart rate.
   Example for the same 50 year old person:
   70% intensity = 170 x 0.70 = 119 beats per minute
   85% intensity = 170 x 0.85 = 145 beats per minute (vigorous intensity goal is 119-145)

The problem with the heart rate calculation method is, what if your heart rate is different than what the textbooks call “normal.” Some people have hearts that beat faster or slower than other people their age. Following is another way of determining level of intensity.
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Perceived Exertion Scale

Perceived exertion is how hard you feel your body is working. It is based on the physical sensations a person experiences during physical activity, including increased heart rate, increased respiration or breathing rate, increased sweating, and muscle fatigue. Although this is a subjective measure, a person’s exertion rating may provide a fairly good estimate of the actual heart rate during activity.

Look at the rating scale on the next page while you are engaging in an activity; it ranges from 6 to 20, where 6 means “no exertion at all” and 20 means “maximal exertion.” Choose the number that best describes your level of exertion. This will give you a good idea of the intensity level of your activity, and you can use this information to speed up or slow down your movements to reach your desired range.

Try to estimate your feeling of exertion as honestly as possible, without thinking about what the actual physical load is. Your own feeling of effort and exertion is important, not how it compares to other people.
While you are being physically active, choose a number from the rating scale below that best matches your level of exertion.

6  No exertion at all

7  Extremely light (7.5)

8

9  Very light

10

11  Light

12

13  Somewhat hard

14

15  Hard (heavy)

16

17  Very Hard

18

19  Extremely hard

20  Maximal exertion

9 – 13 are target ranges.

Moderate intensity exercise is enough.

9 = “very light” exercise. For a healthy person, an example is walking slowly at his or her own pace some minutes

13 = “somewhat hard” exercise, but it still feels OK to continue. You can carry on a conversation without gasping for air.

17 = “very hard” is very strenuous. A healthy person can still go on, but he or she really has to push him-or herself. It feels very heavy, and the person is very tired.

19 = “extremely strenuous” exercise level. For most people this is the most strenuous exercise they have ever experienced. *Adapted from Borg RPE scale ACS Sports Medicine Book
What about Fatigue?

Cancer treatments can create significant amounts of fatigue. The fatigue associated with cancer treatments often cause people to live their lives in one of two ways:

1. Some people decide to reduce their activity and do substantially less each day. Over time, this group of people begin to feel like nothing is getting accomplished and/or things are starting to pile up. Then they overwork themselves to try to catch up.

2. Some people attempt to fight through the fatigue and then crash later. This group often tries to do everything they can in the morning but then end up doing little or nothing all afternoon. Both of these styles are called the Boom-Bust pattern of activity and fatigue. Both of these approaches have you doing high levels of activity followed by low levels of activity because of extreme fatigue. The graph below shows this pattern of activity. Researchers have shown that the boom-bust activity pattern actually leads to lower activity levels over time. The dotted red line on the graph shows how activity levels go down over time (from psychologytools.org).

A boom-bust pattern of activity can lead to worsening

To find out how to combat the boom-bust patterns of activity go to the next page.

Activity Pacing:
Activity Pacing is a technique that allows you to be active without making your fatigue worse. It is a middle ground between doing nothing and doing too much. Activity pacing is spending just enough time on an activity to get the most out of it and then spending a short period of time resting. This helps prevent exhaustion from pushing yourself too hard. The dotted red line on the graph below shows how activity pacing enables you to do more over time (from psychologytools.org).

Activity Pacing Involves 3 Steps:

1. Each evening set up a schedule for the following day. Try to go to bed and get out of bed at the same time every day.
2. Schedule rest periods throughout the day and make sure you take them as scheduled. You must take a scheduled rest even if you are not tired or exhausted.
3. At the end of each day evaluate your fatigue level. Then adjust the amount of activity or rest based on your end of the day evaluation. More rest if you are too tired and more activity if you feel good.

Remember

1. Pacing is about stopping an activity based on TIME and not on FATIGUE.
2. You often need to accomplish bigger tasks in smaller chunks.
3. Pushing yourself too much results in greater fatigue and more time to recover.

What kind of exercises can I do?
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First, check with your primary care physician, your oncologist, and your surgeon (if a surgeon was involved in your care). Sometimes there are restrictions on certain activities or motions that may limit your choices. For instance after a mastectomy, heavy lifting is discouraged or if you have a mediport, it should not be submerged in water.

1) Walking. It’s easy, free, and no further instructions or equipment are needed!
   a. “But it’s too hot outside in Texas!” Or “I can’t walk for that long without becoming completely worn out.” Walk in place or around the room during commercials or at least every 30-60 minutes of sitting. A recent study compared brisk walking (in place or in the room) during commercial breaks during 90 minutes of television watching to 30 minutes of brisk walks. The increase in number of steps each group took was almost the same! On average, both groups increased the number of steps taken during the day by 3000!
   b. You don’t have to do all of the walking at once. You can break it up into 2 or 3 times a day to total 30 minutes.

2) Pool exercise. If you have access to a pool, this is another easy and fun way to increase activity. You don’t need to swim, you just need to walk around the pool, perform some
kicks while standing and move your arms around in the water. The wonderful thing about the pool is the water will help provide buoyancy to decrease pressure (and potential pain) on your joints and provide resistance which will help improve endurance and strength without causing pain. If you have access to a therapy pool with warm water, this also improves aching and sore muscles. Pool exercise has been shown to help with osteoarthritis in the knees and back, fibromyalgia, and muscle achiness.

3) Stairs. If you have stairs in your house or apartment, just go up and down them a few times in a row at least a couple times a day.

4) Apps on your phone. If you have a smart phone, there are a lot of exercise apps and apps that calculate activity during the day.
5) The “mother” weight lifting program. Created by busy stay at home mothers that had no time to work out. Use items in your household to lift (jug of milk, cans of vegetables, etc). Strengthening and weight lifting is good for your muscle health and bone health. You don’t need heavy weights, one pound or a few pounds are good enough. The key is repetition and slow movements. Slowly lower and raise the weight. You can perform bicep curls and deltoid lifts. You can perform lunges or squats (without weights, and holding onto a counter if needed). You can use your bathtub or a chair propped against the wall for triceps dips. If you have never done this (or it has been a long time), start with only 5 repetitions and stop. Increase the number of repetitions as it gets easier.

6) Tai Chi. This is a Chinese martial art that combines self-defense with physical and mental fitness. It is practiced today primarily for its health benefits, stress relief, and relaxation. The practice of Tai Chi is made up of slow, continuous movements that are designed to impart powerful physical skills and to stimulate the flow of energy within the body. Muscular power is de-emphasized and the intrinsic strength of the bones, tendons, ligaments and musculature are developed through relaxation and proper structure. Tai Chi has been shown to improve strength, balance and coordination.

7) Yoga. This is best known as a set of motions that include gentle stretches, breathing practices, and progressive deep relaxation. Yoga integrates the body, mind and spirit in
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harmony. Yoga postures and breathing can improve the physical body, but due to their effect on the brain, they also can affect the mind.

When exercising, it is ok for there to be some pain. If the pain lingers all day (and into the next), then you over did it and should decrease the amount next time. If there is sharp, severe pain when exercising, then stop right away. It is considered normal to be slightly out of breath when exercising. However, if you cannot catch your breath after a few minutes, you over did it and should start slower the next time.

Never feel discouraged when you first start exercising. It’s going to feel hard and you will be tired, but the only way for you to get stronger and healthier is to keep at it. With time and effort, it will be easier. Even avid runners will train for months for a marathon. When it does get easier, push yourself a little more (faster walks, longer exercise time, heavier weights or more repetitions).
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Personal Activity Plan and Contract

Setting specific and measurable short and long terms goals is important to your success. Make a contract with yourself about how you will maintain regular physical activity.

My short term goals:
1. __________________________________________________________________________
2. __________________________________________________________________________
3. Example – Download and then use an exercise app 3 times per week

My long term goals:
1. __________________________________________________________________________
2. __________________________________________________________________________

Example – I will be able to walk for 30 minutes within 6 weeks.

Actions I can take to achieve these goals:
1. __________________________________________________________________________
2. __________________________________________________________________________

Example – I will park my car further away in the parking lot from my work entrance.

I will evaluate my goals on ________________ (date).

Signed: ________________________________ Date: ________________________________
Let’s see what you have learned:

1. Is it a bad idea to be active or exercise while getting cancer treatment?  
   True T  False F

2. Exercise can improve my mood and energy level during or after cancer treatment.  
   True T  False F

3. Exercise really means going to the gym every day in order to run several miles and lift weights.  
   True T  False F

4. Exercise can reduce the chance of recurrence in some cancers.  
   True T  False F

Directions: Compare your pre- and post-test answers to the correct answers listed below.

1. F
2. T
3. F
4. T