

# Exercise After Spinal Cord Injury

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www.msktc.org/sci/factsheets

SCI Fact Sheet

This fact sheet explains the important role that exercise and nutrition play after a spinal cord injury (SCI). It also describes some problem areas to watch for as you plan your exercise activities.

## Summary

- ◆ If you have a spinal cord injury (SCI), you can and should be physically active.
- ◆ Your health will benefit from regular exercise after SCI.
- ◆ Your exercise program should include three parts: stretching, aerobic exercise, and strength training.
- ◆ Setting goals, recognizing potential barriers, being prepared, and learning about resources can help you have a successful exercise program.
- ◆ With so many options, you can find an exercise program that is right for you.

## Introduction

People with SCI are more likely than the general population to have health problems related to weight gain, changes in cholesterol, and high blood sugar. People with SCI are also at higher risk of cardiovascular disease. Not being active may contribute largely to these problems.

Normal, everyday activities aren't enough to maintain cardiovascular fitness in people with SCI. Regular exercise can help to reduce the risk of health problems after SCI.

## Importance of Regular Physical Activity

- ◆ Improves energy levels and ability to take part in activities
- ◆ Strengthens muscles
- ◆ Increases flexibility
- ◆ Improves mood
- ◆ Improves sleep
- ◆ Decreases pain
- ◆ Helps achieve and maintain a healthy weight
- ◆ Improves cholesterol
- ◆ Improves blood sugar
- ◆ Decreases the risk of heart disease

Because of these benefits, exercise is more than just fun—it's a form of medicine that can be a powerful tool for preventing and treating many health conditions.

## Exercise Guidelines

Exercise should include stretching, aerobic exercise, and strength training. The Centers for Disease Control and Prevention (CDC) recommends three exercise options for adults:

- ◆ 150 minutes of moderate-intensity aerobic exercise every week and strength training 2 or more days per week. Strength training should focus on all possible major muscle groups.

OR

The Spinal Cord Injury Model System is sponsored by the National Institute of Disability, Independent Living, and Rehabilitation Research, U.S. Department of Health and Human Services' Administration for Community Living. (See <http://www.msktc.org/sci/model-system-centers> for more information).



- ◆ 75 minutes of vigorous-intensity aerobic exercise every week and strength training 2 or more days per week, to work all possible major muscle groups.

OR

- ◆ An equal mix of moderate- and vigorous-intensity aerobic exercise and strength training 2 or more days per week, to work all possible major muscle groups.

If you can't meet these guidelines, then exercise regularly based on your abilities. Avoiding inactivity is very important. Any amount of exercise is better than no exercise. Talk to a trainer, physical therapist, clinical exercise physiologist, or your doctor for more guidance. For more information, consult [CDC's Physical Activity Guidelines](http://www.cdc.gov/physicalactivity/everyone/guidelines/) (<http://www.cdc.gov/physicalactivity/everyone/guidelines/>).

### Stretching

People with SCI should stretch regularly to prevent and treat stiff muscles and joints. A good flexibility program should stretch all major muscle groups. You should focus on your shoulders, hips, knees, and ankles, because these are common areas of tightness after SCI. Stretching can be done by yourself or with help from a trainer, therapist, aide, family member, or friend. You should stretch most days of the week. Some people with SCI even find it helpful to stretch many times per day. Start out by gently stretching each muscle group for at least 30 seconds. Repeat the stretch a second time, trying to go a little bit further. Also consider stretching before and after aerobic exercise and strength training.



*Using an arm crank machine (ergometer) is one option for aerobic exercise that may be available at your local gym.*

### Aerobic Exercise

Aerobic exercise is particularly good for cardiovascular health. You can use the “talk test” to help gauge the intensity of your workout. The test is quite easy. If you are doing moderate-intensity exercise, you should be able to talk but not sing. If you are doing vigorous-intensity exercise, you shouldn't be able to say more than a few words without pausing to take a breath. Aerobic exercise should include three phases:

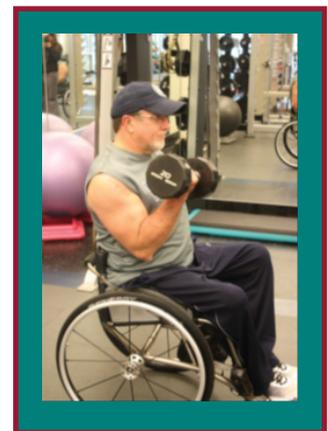
- ◆ Warm up by stretching and doing a light intensity activity. These slowly increase your heart rate and warm up your muscles.
- ◆ Exercise at a moderate or vigorous intensity (based on the talk test).
- ◆ Cool down by doing a light intensity activity. This slowly decreases your heart rate.

### Strength Training

Strength training can be done on the same or different day as your aerobic exercise. But it doesn't count toward your time for aerobic exercise. Strength training should target major muscle groups that you can control. These muscles will differ for everyone depending on their SCI. To start, plan to perform each exercise at least 10 times (10 repetitions = 1 set). Take a short break. Repeat each set one or two times. To get the most out of strength training, perform to a point where it is hard for you to do another repetition without help.

### Scheduling Exercise

It is best to exercise in routines of at least 30 minutes. But even as little as 10 minutes of physical activity at a time can provide health benefits. If possible, spread out your exercises throughout the week. The more time you spend exercising, the more health benefits you'll get!



*Some individuals may choose to use free weights for strength training.*

## Options for Exercising

One of the great things about exercise is that so many options exist. Exercise can occur as part of your daily routine, such as walking or wheeling to work. Exercise can be done in your home (e.g., following an exercise video), at a gym, or in the community. You can exercise alone or with others.

Examples of stretching include:

- ◆ Yoga
- ◆ Laying on your stomach
- ◆ Using a standing frame
- ◆ Using exercise bands

Examples of aerobic exercise include:

- ◆ Hand cycling
- ◆ Rowing
- ◆ Circuit training
- ◆ Swimming
- ◆ Playing wheelchair basketball
- ◆ Pushing your wheelchair briskly (if you use a wheelchair)

Examples of strength training include:

- ◆ Weightlifting
- ◆ Using resistance bands
- ◆ Yoga

You might need special equipment to exercise, depending on your needs and how and where you choose to exercise, for example:

- ◆ Straps to improve positioning, stability, and balance while exercising
- ◆ Cuffs or wraps to help grip the exercise equipment
- ◆ Body weight support
- ◆ Electrical stimulation to help exercise muscles that are below the level of the injury

## Where to Start

1. Think about your goals for physical activity. This will be different for everyone. Here are some examples:
  - ◆ Become physically fit and improve your heart health
  - ◆ Lose weight and use less medicine
  - ◆ Be active and enjoy the outdoors
  - ◆ Make friends at a gym or exercise class

Choose goals that you can attain. But the goals should be challenging too—think big! Write down your goals, and refer to them a lot. Use your goals to motivate and to remind you why you started exercising.



*When using exercise equipment, a chest strap can be helpful to provide trunk stabilization.*



*Equipment such as kettle bells can be used for strength training in individuals with decreased hand function.*

2. Think about a location that is best for you to exercise and keep an exercise routine. You should consider your level of mobility, options for transportation, whether you prefer to exercise alone or in a group, and accessibility of local fitness centers. There is no right or wrong place. Focus on a setting that will give you the best chance for success. For example, if you know that you'll need support and encouragement from other people, then a home-based exercise program is probably not the right choice for you. Ask yourself the following questions:
  - ◆ Do I want to exercise at home or at a fitness center? Inside or outside?
  - ◆ Do I want to exercise by myself or with others?
  - ◆ What equipment will I need to exercise? Where can I get it?
  - ◆ Am I interested in fitness classes? If so, when and where are they offered?
  - ◆ What options do I have for transportation?
  - ◆ Will I be able to access the local fitness center? Are the lockers, showers, and restrooms accessible?
  - ◆ When is the fitness center open? Do these hours work for me?
  - ◆ Will I receive assistance and expert help?
  - ◆ What fitness plan can I afford?
3. Learn more about the resources in your community. Talk to your doctor or physical therapist about your goal to exercise regularly. Do they have any suggestions? Talk to other people with SCI in your community. Where do they exercise? What resources do they find helpful? If you live in or near a city, look for a hospital or rehab center in which staff work with people with SCI. They may know of local, accessible exercise programs and recreation resources. Check out places like the YMCA. Are its facilities accessible? Does it have trainers who know how to work with people with SCI? The first few places you contact may not be right for you. Don't give up.
4. Finally, choose an engaging activity—one that excites you. And stick with it!

## Ready? Set? What's Next?

Go easy as you start to exercise. If you're not used to exercising, give your body time to adapt to being active. If you have not exercised recently, you should first get comfortable doing moderate-intensity activities before adding more vigorous-intensity activities. Don't give up if you don't like the activity that you chose. With so many options, you can always choose another activity.

## Eat Right

Make the most of your exercise program by also eating right. Like exercise, good nutrition can help to manage blood pressure and cholesterol and decrease your risk of diabetes and heart disease. Eating right promotes a strong immune system and helps to prevent skin breakdown. A good diet will also give you the energy you need to exercise:

- ◆ Eat breakfast.
- ◆ Eat small portion sizes.
- ◆ Eat five servings of fruits and vegetables per day.
- ◆ Eat lean protein, such as chicken and fish, instead of red meat.
- ◆ Limit eating processed foods and foods high in fat.
- ◆ Choose healthy snacks between meals.
- ◆ Stay hydrated.

For more information about nutrition and eating right, consult [Weight Management Following Spinal Cord Injury](http://images.main.uab.edu/spinalcord/SCI%20Infosheets%20in%20PDF/Weight%20Management%20following%20SCI.pdf) (<http://images.main.uab.edu/spinalcord/SCI%20Infosheets%20in%20PDF/Weight%20Management%20following%20SCI.pdf>).



## Troubleshooting

### Overcome Barriers to Getting Involved

Even if you really want to exercise, some barriers may make starting more difficult than you might think, for example:

- ◆ Being unsure of what to do
- ◆ Being unsure of where to go
- ◆ Financial barriers
- ◆ Finding and scheduling reliable transportation
- ◆ Fear of stigma and negative attitudes
- ◆ Health-related concerns, such as skin breakdown, shoulder pain, autonomic dysreflexia, or changes to your bowel and bladder management.

These problems are common. But know that you aren't alone. Talk to your trainer, therapist, doctor, or friends to help find the best solution. Every person is different. Every solution is unique. Don't give up!

### Stay Committed

Here are some tips to stay on track with your exercise program:

- ◆ Remember your goals.
- ◆ Plan out your activities weekly. Have reasonable expectations.
- ◆ Exercise at the same time of day so it becomes part of your regular routine.
- ◆ Keep track of your progress by writing your exercises in a calendar or journal.
- ◆ Be flexible. If something comes up and you can't exercise as planned, work physical activity into your day in other ways.
- ◆ Make exercise fun. Try working out with other people, adding some variety to your exercise routine, or listening to music or audiobooks.
- ◆ Celebrate success!

## Be Aware of Potential Health Problems

Exercise should be fun and safe. But you should always be on the lookout for potential problems.

### Skin Breakdown

Many people with SCI have changes or lack feeling below the level of the injury. For example, you may not be able to feel a new cut on your skin. Exercise may increase pressure or friction on the skin. This can increase the risk of skin breakdown.

What to do:

- ◆ Pay special attention to the surface on which you sit or lay.
- ◆ Use your wheelchair cushion whenever possible, especially on hard surfaces.
- ◆ Secure yourself to the exercise surface to avoid increased friction.
- ◆ Perform weight shifts every 30 minutes for 2 minutes.
- ◆ Check your skin daily.
- ◆ Tell your doctor if you have an area of skin that gets red regularly when exercising or gets red and doesn't go away.



## Temperature Regulation

People with SCI may not be able to keep a safe body temperature when exercising. Sweating normally cools you down during exercise. If you don't sweat below the level of the injury, you can overheat quickly. Overheating can even happen when it is cool outside. On the other hand, you may not be able to stay warm when you exercise in the cold.

What to do:

- ◆ Drink water or fluids before, during, and after exercise.
- ◆ Wear clothing in layers so you can adjust as needed.
- ◆ In warm weather, use a cold towel or spray bottle to help you stay cool.
- ◆ In cold weather, make sure that your arms, hands, feet, and legs don't get too cold.

## Orthostatic Hypotension

Some people with SCI experience a drop in blood pressure when in an upright position. This is known as orthostatic hypotension. It tends to occur most often when changing from a lying position to sitting or from a sitting position to standing. It can also occur when sitting or standing for a long period of time.

People with a SCI level above T6 have an increased risk of orthostatic hypotension. Common symptoms include lightheadedness, dizziness, and nausea.

What to do:

- ◆ If the exercise calls for sitting or standing, make sure you can first tolerate that position.
- ◆ Avoid quickly moving from lying to sitting or from sitting to standing.
- ◆ Stay hydrated.
- ◆ If you develop symptoms, try using compression stockings and an abdominal binder when exercising.
- ◆ If you have symptoms of orthostatic hypotension, lay on your back with your feet elevated until your symptoms go away.
- ◆ Talk to your doctor if your symptoms make it hard for you to exercise.

## Autonomic Dysreflexia

After SCI, your body may change the way it responds to pain, discomfort, or irritation below the level of the injury. Even if you can't feel below the level of the injury, your body can find a way to tell you that something is wrong. One way may be through the quick onset of very high blood pressure. This is known as autonomic dysreflexia (AD).

AD can be deadly if not treated. People with a SCI level above T6 are at risk of AD. Common symptoms include headache, sweating, nausea, goosebumps, and a stuffy nose. Anything that would cause pain below the level of the injury can cause AD. Examples include full bladder or leg bag, constipation, tight clothes, pressure sore, blister, ingrown toenail, urinary tract infection, or broken bone.

What to do:

- ◆ Learn about and notice the symptoms of AD. Check out the MSKTC factsheet on AD at <http://www.msktc.org/sci/factsheets>.
- ◆ If you have symptoms while exercising, stop right away and try to determine and reverse the cause:
  - Sit up.
  - Loosen any tight clothing.
  - Check your bladder (is your leg bag full, is your catheter draining, or do you need to catheterize).
  - Move off of any pressure sores or high pressure areas.
  - Seek medical help quickly if your symptoms don't go away.



## Overuse Injuries

People with SCI are at risk for overuse injuries. These types of injuries occur when you use the same muscles and movements for both everyday activities and exercise. Shoulder pain is the most common overuse injury in people with SCI.

What to do:

- ◆ If possible, consider alternatives to wheelchair pushing for exercise.
- ◆ Practice good body mechanics when exercising (and with everyday activities).
- ◆ Balance routines of stretching, aerobic exercise, and strength training. Remember, a good exercise program includes all three parts.
- ◆ Talk to your trainer, therapist, or doctor about new or increasing pain. They may want to alter your exercise program and daily activities or develop a treatment plan.

## Bone Loss and Broken Bones

People with SCI who don't walk regularly are at risk of weaker bones or bone loss below the level of the injury. This bone loss increases the risk for broken bones—even after only mild trauma, such as twisting your leg or falling from your wheelchair. Because of changes in sensation in some people after SCI, you may not even be aware of a broken bone.

What to do:

- ◆ Talk to your doctor about your risk for bone loss and broken bones before starting a new exercise program.
- ◆ Talk to your doctor about whether or not any medications or supplements may be helpful in optimizing your bone health.
- ◆ Seek medical attention if you notice any new pain, swelling, or redness or increased AD

## Additional Resources

The [CDC's Physical Activity Guidelines](http://www.cdc.gov/physicalactivity/everyone/guidelines/) (<http://www.cdc.gov/physicalactivity/everyone/guidelines/>) includes definitions for exercise.

American Congress of Rehabilitation Medicine has created a guide with exercise [recommendations and considerations for persons with spinal cord injury](http://www.archives-pmr.org/article/S0003-9993(15)00118-5/pdf) ([http://www.archives-pmr.org/article/S0003-9993\(15\)00118-5/pdf](http://www.archives-pmr.org/article/S0003-9993(15)00118-5/pdf)).

The [National Center on Health, Physical Activity and Disability](http://www.nchpad.org) (<http://www.nchpad.org>) offers a lot of information about exercise, nutrition, weight loss, and advocacy initiatives for people with disabilities. For example, "[14 Weeks to a Healthier You](#)" can help you set up an exercise and nutrition program that's right for you.

## Authorship

Exercise After Spinal Cord Injury was developed by Cheri Blauwet, M.D., and Jayne Donovan, M.D., in collaboration with the National Center on Health, Physical Activity and Disability (NCHPAD) and the Model Systems Knowledge Translation Center. Credit for these images goes to Lakeshore Foundation and NCHPAD.

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