

# Scientific Exercise Guidelines for Adults With Spinal Cord Injury

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Physical activity is an important consideration after spinal cord injury (SCI) and is a key factor in preventing lifestyle diseases. This page provides guidelines for physical activity following SCI.

## Key points

- People with SCI face tremendous physical, psychosocial, and environmental barriers to physical activity. They are less active and more physically deconditioned than the general population and people with other disabilities.
- Overwhelming evidence suggests that people living with SCI can achieve health benefits from activity levels well below the generally recommended 150 min/week threshold.
- The guidelines herein were created for adults aged 18-64 with chronic SCI (at least one year post-onset), with consideration given to the potential risks of SCI-specific adverse events including upper-body over-use injuries, skin breakdown, autonomic dysreflexia, and overheating as well as consideration to the feasibility of these guidelines in the SCI population.

## How were the exercise guidelines developed?

A group led by Dr. Kathleen Martin Ginis at the University of British Columbia and Dr. Victoria Goosey-Tolfrey at Loughborough University, UK developed international guidelines on exercise after SCI. The process of developing these guidelines involved a systematic review of relevant literature, consensus meetings, stakeholder feedback, and a formal audit of the process.

The result was the publication of the journal article about the guidelines (available in the journal *Spinal Cord* via [nature.com/articles/s41393-017-0017-3](https://www.nature.com/articles/s41393-017-0017-3)) and the actual guidelines titled, “Scientific Exercise Guidelines for Adults with Spinal Cord Injury” which are described next.

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**ARTICLE**

**Evidence-based scientific exercise guidelines for adults with spinal cord injury: an update and a new guideline**

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**Abstract**

**Objectives** To describe the process and outcomes of using a new evidence base to develop scientific guidelines that specify the type and minimum dose of exercise necessary to improve fitness and cardiometabolic health in adults with spinal cord injury (SCI).

**Setting** International.

**Methods** Using Appraisal of Guidelines, Research and Evaluation (AGREE) II reporting criteria, steps included (a) determining the guidelines' scope; (b) conducting a systematic review of relevant literature; (c) holding three consensus panel meetings (European, Canadian and International) to formulate the guidelines; (d) obtaining stakeholder feedback; and (e) process evaluation by an AGREE II consultant. Stakeholders were actively involved in steps (c) and (d).

**Results** For cardiorespiratory fitness and muscle strength benefits, adults with a SCI should engage in at least 20 min of moderate to vigorous intensity aerobic exercise 2 times per week AND 3 sets of strength exercises for each major functioning muscle group, at a moderate to vigorous intensity, 2 times per week (strong recommendation). For cardiometabolic health benefits, adults with a SCI are suggested to engage in at least 30 min of moderate to vigorous intensity aerobic exercise 3 times per week (conditional recommendation).

**Conclusions** Through a systematic, rigorous, and participatory process involving international scientists and stakeholders, a new exercise guideline was formulated for cardiometabolic health benefits. A previously published SCI guideline was endorsed for achieving fitness benefits. These guidelines represent an important step toward international harmonization of exercise guidelines for adults with SCI, and a foundation for developing exercise policies and programs for people with SCI around the world.

## The scientific exercise guidelines for adults with SCI

For cardiorespiratory fitness and muscle strength benefits, adults with SCI should engage in:

- At least 20 minutes of moderate to vigorous intensity aerobic exercise 2 times per week.
- 3 sets of strength exercises for each major functioning muscle group, at a moderate to vigorous intensity, 2 times per week.

For cardiometabolic health benefits, adults with SCI should engage in:

- At least 30 minutes of moderate to vigorous intensity aerobic exercise 3 times per week.



### The guidelines

#### Fitness

For cardiorespiratory fitness and muscle strength benefits, adults with SCI should engage in at least:

**20** minutes of moderate to vigorous intensity aerobic exercise **2** times a week  
+  
**3** sets of strength-training exercises for each major functioning muscle group, at a moderate to vigorous intensity **2** times a week

#### Cardiometabolic health

For cardiometabolic health benefits, adults with SCI are suggested to engage in at least:

**30** minutes of moderate to vigorous intensity aerobic exercise **3** times a week

## What are cardiometabolic health, cardiorespiratory fitness, and muscle strength?

### Cardiometabolic health

Cardiometabolic health encompasses measures of body composition (e.g., fat mass, lean body mass) and risk factors for cardiovascular disease (e.g., high cholesterol and hypertension). Common measures to assess cardiometabolic health include a blood test to assess triglycerides and cholesterol, measuring blood pressure, and measuring height, weight, and waist circumference.

### Cardiovascular fitness

Cardiovascular fitness refers to the ability of the heart and lungs to deliver oxygen to working muscles and can be assessed through a maximal graded exercise test which provides information such as peak oxygen uptake and peak power output.

### Muscle strength

Muscle strength refers to the amount of force that a muscle can exert. It can be measured by lifting objects of specified weight or exerting force against a measurement tool such as a hand grip dynamometer.

## The exercise guideline details

These exercise guidelines provide minimum thresholds for improving cardiorespiratory fitness and muscle strength and for improving cardiometabolic health.



If you are not already exercising, it is okay to start with smaller amounts of exercise and gradually increase duration, frequency, and intensity, as a progression toward meeting the guidelines. Doing exercise below the recommended levels may or may not bring small changes in fitness or cardiometabolic health.



Exceeding these exercise guidelines would be expected to yield additional cardiorespiratory fitness and muscle strength and cardiometabolic health benefits. However, there are insufficient data to comment on the risks associated with a person with SCI exceeding these guidelines.

Refer to our article on [Physical Activity](#) for more information!



The guidelines should be achieved above and beyond the incidental physical activity one might accumulate in the course of daily living. Adults are encouraged to participate routinely in exercise modalities and contexts that are sustainable, enjoyable, safe and reasonably achievable.

These guidelines are appropriate for adults (aged 18-64) with chronic SCI (at least one year post-onset), neurological level of injury C3 and below, from traumatic or non-traumatic causes, including tetraplegia and paraplegia, irrespective of sex, race, ethnicity or socio-economic status.

The guidelines may be appropriate for individuals with a SCI less than one year post-onset, aged 65 years or older, or living with comorbid conditions. There is currently insufficient scientific evidence to draw firm conclusions about the risks and benefits of the guidelines for these individuals. These individuals should consult a health care provider prior to beginning an exercise programme.

The risks associated with these guidelines are minimal when managed in consultation with a health care professional who is knowledgeable in SCI. Individuals with a cervical or high thoracic injury should be aware of the signs and symptoms of autonomic dysreflexia during exercise.

Refer to our article on [Autonomic Dysreflexia](#) for more information!



## The bottom line

These guidelines were developed using transparent and rigorous steps that align with international best-practices for developing clinical practice guidelines. They represent an important step toward developing exercise policies and programs for people with SCI around the world.

## Related resources

SCI Action Canada: <https://sciactioncanada.ok.ubc.ca/>

National Centre for Sport & Exercise Medicine: <http://ncsem-em.org.uk/sciguideurope/>

Cardiovascular Health and Exercise: <https://scireproject.com/evidence/cardiovascular-health-and-exercise/>

## Abbreviated reference list

Full reference list available from: [community.scireproject.com/topic/exercise-guidelines/#reference-list](https://community.scireproject.com/topic/exercise-guidelines/#reference-list)

Glossary terms available from: [community.scireproject.com/topics/glossary/](https://community.scireproject.com/topics/glossary/)

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