

Adapted Sports and Equipment

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Key points

- Staying active after SCI has many benefits, but structured workouts may not be for everyone. Sports may be a good alternative to stay physically active.
- *Adapted sports* (sometimes called “adaptive sports”) are sports that use modified equipment to allow individuals of all abilities to participate.
- Participating in adapted sports is a great way to build social connections with others and to become a part of a community.
- There are a variety of sports that can be played including cycling, court sports, winter sports, and water sports. This article introduces various adapted sports and the required equipment to partake in them.

Why be physically active after SCI?

Staying physically active after SCI is important for your health. There is moderate to strong evidence that physical activity has many benefits after SCI including:

- Allowing you to perform everyday activities (e.g., shopping, cooking, transferring) with more ease,
- Improving depression and quality of life,
- Increasing muscle strength and endurance,
- Management of blood sugar levels,
- Helping you to breathe with more ease,
- Reducing pain and spasticity.

Although going to a gym is one common way to get moving, there are a variety of adapted sports that can also be played. While this article discusses a selection of adapted sports (including handcycling, court sports, winter sports, and water sports), it should be noted that almost any sport can be adapted for participation after SCI.

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



What are adapted sports?

Adapted sports are sports that can be played with equipment and approaches that are adapted to a person's physical abilities. Many adapted sports have been altered in one of many ways to promote accessibility. Some of these adaptations include changes to the rules of a game, modifications in the equipment, or specialized equipment to allow you to partake in a sport.

Athlete Classification

There are different levels of adapted sports, ranging from recreational (or just for fun and fitness) to competition. Should you want to become competitive, *classifications* are used to ensure that competition is equal and fair. Classifications are used to determine which athletes should be grouped together. In adapted sports, classification is based on function (e.g., strength, how many limbs are affected by injury, range of movement, tone/spasticity). This is similar to categorizing by age, gender, or weight in able-bodied sports.



Precautions when trying new sports



While trying out new sports can be fun and exciting, skin health is an important consideration. Trialing new sports is often associated with trying new equipment. When trying new equipment, it is important to check for red marks or pressure spots on your skin including your seat and any area of the body positioned against equipment (e.g., footrest or frame). People will commonly use the cushion from their everyday chair in their sport chair when they first try a sport. However, it is important to remember that although it is the same cushion, you may be sitting in a different position (e.g., seat angle) which will change pressure and potential forces from rubbing. The best approach is like that of trialing a new wheelchair or cushion: frequently check your skin in the early days of your new sport. This means that it is best to start with shorter sessions and work your way up in time once you know that your skin can tolerate the new equipment and positions. In water sports such as kayaking, or in rainy conditions for outdoor sports, make sure to check your skin when you are done since being wet can make the skin more prone to injury.

Refer to our article on [Pressure Injuries](#) for more information!



Additionally, you may want to consider the influence of temperature (extreme hot or cold weather), as temperature regulation may be impaired with an SCI.

What types of cycling and pushing sports are there?

Handcycles are a type of bicycle that is propelled by the arms instead of the legs. There are different types of handcycles available for all levels of ability. In general, most arm-cycles have alternative handle options for those with limited hand function.

Types of arm cycles

Recumbent cycles

Recumbent arm-cycles are three wheeled bikes that are controlled with the arms while seated in a reclined position. This type of bicycle has support straps to rest the feet in while cycling.



Upright cycles

Upright cycles are similar to recumbent bikes in that the feet are on either side of the front wheel. However, the user is seated in a more upright position when using this bike.



Tandem bikes

A variety of tandem arm bikes are available. Bike models are available to allow riders to either ride beside each other, or one in front of the other. Power-assist versions are also available for those who may have some function in their legs.



Arm cycle add-ons

Refer to our article on [Wheelchair Propulsion Assist Devices](#) for more information!



Instead of buying a separate wheelchair, arm-cycle add-ons are available for manual wheelchair users. These add-ons connect to the front of a manual wheelchair, lifting up the casters. This then allows an individual to propel their wheelchair via an arm cycle. Additionally, power-assist versions are available for those with less upper body strength.



Off-road wheelchairs

If you are looking to go on some trails, an off-road wheelchair may appeal to you. These wheelchairs are used for recreational riding, such as going for a hike, or going fishing. Off-road wheelchairs often have larger, knobbier tires that are meant to withstand the trail, roots, and rocks. Like the arm-cycles, off-road wheelchairs come in a variety of set ups. Some setups may look like a typical manual wheelchair, but with larger wheels. There are also ones that are controlled with push-levers (such as the [mountain trike](#)), and powered wheelchairs with more power, suspension, and agility (such as the [x5 frontier](#), and the [x8-extreme all-terrain wheelchair](#)).



Wheelchair racing

For those who are interested in competition, wheelchair racing may be an option. Wheelchair race events range from the 100m, 200m, 400m, 800m, 1500m, and 5k distance races in track and field, to marathons. Racing



wheelchairs differ from the wheelchairs and cycles listed above in that they typically have two wheels with a third one extended out in front. Ideally, race chairs should be light-weight to enhance performance. When seated, the

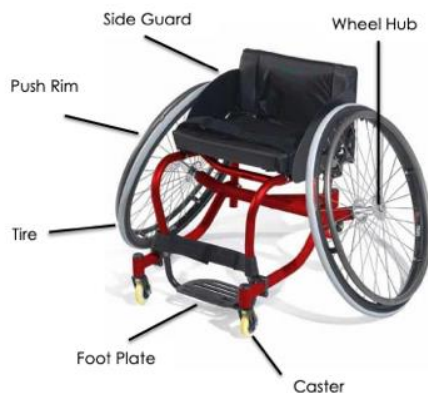
wheelchair should fit “like a glove”, and there should be little movement in the seat. Unlike arm-cycles, the feet are bent down and kept closer to the body. In addition, specialized rubber gloves are worn to push the rims during races.



What adapted court sports are available?

Tennis

Wheelchair tennis is played on the same court as able-bodied tennis, and with similar rules. One rule difference is that in wheelchair tennis, players are allowed two bounces instead of one, and the second bounce can be anywhere – even out of bounds. Although one can play wheelchair tennis in their day chair, tennis wheelchairs are often preferred during play. These



wheelchairs are faster, lighter, more agile, and more stable. The wheels on the wheelchair are also angled (i.e., there is more camber) to allow for more swift turning. For those with limited hand function, taping the racquet to your hand is common practice, though it can take some time to find the optimal tension for you. Therefore, people with all levels of ability can play wheelchair tennis.



Basketball

Wheelchair basketball is played on a standard basketball court. The wheelchair used for basketball is one with wheels angled to 15-20 degrees and a single rollerblade used for a caster at the back. In addition, there are many strapping options to promote stability and safety, or to hold the body in a certain position. Commonly strapped body parts include the hips, knees, feet and/or ankles. It is common for wheelchair basketball leagues to include able bodied participants at the local level of competition. This allows for more players and teams for great league play.

Rugby

Wheelchair rugby was developed specifically for people with tetraplegia and has grown to include people without SCI but with similar functional abilities (e.g., some impaired arm and hand function in addition to impaired leg function). Wheelchair rugby is played with a volleyball.



An offensive wheelchair used for rugby.¹⁵

The goal of the game is to carry the ball over the other team's goal line. Unlike able-bodied rugby, wheelchair rugby is played indoors on a court. Specialized wheelchairs are used to play wheelchair rugby and can be separated into chairs for offensive players and chairs for defensive players. Offensive wheelchairs are set up for speed and mobility and are distinguished with a front bumper to prevent other chairs from hooking them. Often, offensive chairs are used by players with more function. On the other hand, defensive wheelchairs are set up with a bumper to hook and hold onto other players. Defensive chairs are often used by players with less function. Additional equipment used in rugby include straps and gloves. Straps are used on the waist (to compensate for a lack of core muscles), the thighs (to prevent them from falling to the side or from shifting side to

side), and the feet (for comfort). Meanwhile, gloves work to protect the skin, add extra grip when pushing the chair, and to making throwing and catching the ball easier.

Community Voices: Byron

Byron has been playing wheelchair rugby for 17 years. He describes it as “a fast-paced sport. You get to hit things with your wheelchair, and at the same time there is a lot of strategy going on.” He enjoys the sport as he explains, “the physical benefits are a big part of why I enjoy playing wheelchair rugby. The community is amazing – it’s great because every practice is an opportunity to see a bunch of my friends.”



What adapted winter sports are available?

Alpine Skiing

Alpine skiing, also known as downhill skiing, is a sport that individuals with SCI can partake in with the use of sit-skis. In general, sit skis have a bucket-type of seat with an adjustable seat and footrest. To create a smoother ride, sit-skis have additional features such as suspensions and a shock compression system under the seat. The seat and suspension/ shock systems are all



connected to either a single ski (*mono-ski*) or a pair of skis (*bi-skis*). In general, mono-skis require the user to have good upper body strength, and the ability to ski independently. Bi-skis are often used by individuals who may require some assistance. Often, bi-skis are used with an able-bodied individual who skis behind them. Skiers who use a sit-ski can use the typical chairlifts at the mountains and with experience, can access all terrains of ski areas.



A mono ski (previous) and a bi-ski (below)¹⁷⁻¹⁸



Cross Country Skiing

Adapted cross country skiing (which is a type of Nordic skiing) allows individuals with paraplegia and tetraplegia to explore snowy trails. Like the alpine skis, cross country skis consist of a bucket seat that connects to a metal frame, which clips into the skis. Cross country skiers also often use poles while skiing to propel themselves along flatter terrain. If assistance is required, an able-bodied person can help push the ski forward with their ski-pole using an adaptive add-on.

Sledge (Ice) Hockey

Sledge hockey, or para ice hockey is identical to ice hockey but is played while sitting in sledges as opposed to standing on skates.

A sledge consists of a plastic bucket-shaped seat that is connected to a metal frame. This frame is set on two adjustable skate blades, with the blades aligned on the bottom of the seat. The skate blades may be adjusted so that they are further apart for stability (good for new players) or can be moved closer together to allow for more maneuverability and speed. Straps are available to help keep the feet, knees, and hips in place. Players propel themselves in the sledge using two sticks. These sticks are dual ended: one end has a blade for handling the puck, while the other end has a metal pick in it to help players propel themselves across the ice. Typical hockey pads are used for safety during play.



What water sports are available?

Sailing

Adapted sailing is a sport that people of all abilities can participate in. Common features of adapted sailboats include handguards along the side of the boats, greater deck space due to removed masts, and customized molded seats with back support and belts that pivot. For individuals with reduced function, other available adaptations include electronic controls (such as the use of a joystick), and sip 'n' puff technology to steer the boat with breath. Many sailing clubs have power/mechanical lifts dockside to assist with transfers into boats.

Community Voices: Terry

Terry has been involved in adapted sailing since 1994. Terry sails a Matin 16 using sip 'n puff technology. Sailing is special to Terry as he says he can “finally get out of my chair and be as free as the wind!” As he is unable to play court sports, sailing has provided Terry a competitive outlet.



Kayaking

Kayaks are available for people with all levels of SCI. While individuals with a lower level of injury may use non-adapted kayaks, adaptations are available for comfort and to accommodate those with limited function. Some kayaks may have custom seating with side and abdominal support. These supports are cushioned to protect the skin while kayaking. Stabilizing outriggers are available to increase stability of the boat and to reduce the chances of tipping. For those with limited arm/hand function, there are various adaptations for the paddle including:



- A back of the hand grip, which places more paddling pressure on the arms instead of the hands.
- Wrist cuff adaptation, which allows individuals to connect the paddle to their wrists via a cuff.

The bottom line

There are many benefits to staying physically active after SCI and there is a large variety of sports to participate in. Whether you prefer staying on land, floating on water, or being in the snow, most sports have been adapted in some way or another so that all who want to can participate! Prior to trying a sport, talk with your health providers to ensure that you are in a condition to play.

Related resources

[International Paralympic Committee](#)

For a list of included resources, please see the [Reference List](#).

Abbreviated reference list

Full reference list available from: community.scireproject.com/topic/adapted-sports/#reference-list
Glossary terms available from: community.scireproject.com/topics/glossary/

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