

# Nutrition and Spinal Cord Injury

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<https://msktc.org/sci/factsheets>

SCI Factsheet

Keys to good health start with understanding nutrition and following a healthy, nutritious diet. This factsheet provides insight into the impact of nutrition on health, wellness, daily activities and overall quality of life after spinal cord injury.

## What Is Nutrition?

Nutrition is the way your body uses the six major nutrients needed for health and function.

- Water
- Protein
- Carbohydrates
- Fats
- Vitamins
- Minerals

## Why Is Nutrition Important?

Your body changes after spinal cord injury (SCI). There is usually reduced muscle and bone mass, added fat, and other changes that make it critical to follow a healthy diet regimen to maintain and improve your health.



- Healthy eating can help lower your risk for becoming overweight or obese and for developing other medical complications, such as constipation, diarrhea, diabetes, infections, and limit your muscle loss.
- Food choices and portion sizes determine how many calories you consume. Extra calories lead to weight gain and affect your daily activities, such as strength, stamina, and transferring.
  - Choose foods that are rich in nutrients while staying within your calorie limits.
- Healthy eating can help improve mental health, physical health and independence.
- Exercise and physical activity can help boost the benefits of healthy eating.

The Model Systems Knowledge Translation Center works with Spinal Cord Injury Model System (SCIMS) centers to provide free research-based rehabilitation resources for people living with spinal cord injury (See <https://msktc.org/sci> for more information). This factsheet has been approved by experts from the SCIMS centers.

## Do Most People With SCI Get Proper Nutrition?

Research shows that many people with SCI do not get proper nutrition. They tend to have diets that are low in fruits, vegetables, and whole grains that are rich in fiber, vitamins, and minerals. They also tend to eat more processed foods, especially fast food, that are usually high in sodium, sugar, and fat.

- Healthy eating is harder if you have limited mobility, income, or access to transportation. These and other factors may be out of your control, but you can learn about nutrition to explore ways to healthier eating, such as choosing healthier frozen meals and snacks. Even small improvements can benefit your health.



## Should I Talk to a Health Professional About My Diet?

Health professionals recommend healthy eating, so most often you can start making healthy food choices on your own. Still, it can be hard to finding health professionals who know a lot about SCI. Here are a few helpful suggestions.



- Rely on your health professional for nutritional guidance if you have medical conditions with dietary restrictions. These include heart disease, diabetes, and other conditions.
- Be mindful that commercial diet programs target the general population and do not consider your personal nutritional needs.
- Review your dietary habits with your health professional every year to talk about how your diet affects your health-related concerns and nutritional and calorie needs. This includes your meals, drinks, snacks, and supplements.
- People with SCI who have difficulty preparing healthy meals may find it helpful to talk to a registered dietitian or registered nutritionist about suggesting healthier food choices that are also easier to prepare.

## How Do the Six Major Nutrients Affect My Health?

### Water

Proper hydration is needed to stay healthy. Here are a few of the vital health benefits of staying hydrated.

- Flushes out bacteria from the bladder
- Maintains body temperature
- Helps prevent constipation
- Keeps the skin moist, supple, and healthy

Your body absorbs a small amount of water from the foods you eat, but what you drink is your body's main source of fluids.

- Drink plenty of water and limit drinks with sugar, caffeine, and alcohol because they flush water out of your body and are often full of unnecessary calories from sugar and fat, which can lead to weight gain.

The “ideal” amount of water to drink to stay hydrated varies greatly from person to person. The color of your urine usually gives you a good idea of whether your body is properly hydrated. Ideally, your urine should be golden yellow (see graphic). Drink a little less water if your urine tends to be pale yellow or clear. Drink more water if your urine tends to be darker.

Aim to keep your urine color in the ideal range with hydration



- Be aware that some foods and dietary supplements affect the color of your urine. For example, Vitamin B2 can turn urine bright yellow. Foods such as blackberries, beets, and rhubarb can darken the color of your urine.
- You may need to talk to your health professional about your water intake and adjusting your bladder management if you change your water intake.
- Proper water intake helps to maintain your blood pressure within normal range and prevent respiratory tract infections like pneumonia.

### Protein

Protein helps your body maintain a good immune system and fight infection. It helps muscles stay strong and skin stay healthy. Your protein needs depend on your age, gender, body weight, and exercise levels. Your health professional may also recommend more protein to help wound healing.



- Foods with a high protein-to-calorie ratio include seafood, lean meats and poultry, eggs, legumes (beans and peas), nuts, seeds, soy products, and fat-free or low-fat dairy (including milk, yogurt, cheese, and/or soy beverages).
- It is important to eat a variety of healthy foods with protein. If you prefer plant-based protein, make sure to combine different sources, such as grains and legumes, nuts and seeds and legumes.
- You might consider protein supplements like shakes and bars when you cannot get enough protein from food sources. However, it is easier to take in too much protein when taking proteins supplements. Consult your physician regarding any potential adverse effects.



## Carbohydrates

Carbohydrates are an important source of energy that support your body's functions and physical activity. Choosing carbohydrates high in fiber and nutrients, and low in added sugar may help prevent weight gain, diabetes, and improve your bowel health.

- Healthy sources of carbohydrates are unprocessed or minimally processed whole grains, vegetables, fruits, and beans. These foods promote good health by providing your body with vitamins, minerals, fiber, and other important nutrients.
- Unhealthy sources of carbohydrates include white bread, pastries, sugar-sweetened beverages, and other highly processed or refined foods. High intake of unhealthy carbohydrates increases sugar levels, which increases your risk for diabetes and all its complications.
- Be mindful that you need carbohydrates to support your body's functions and physical activity but excess carbohydrate intake converts into fat and increases triglyceride levels, which increases your risk for heart disease and stroke.

### A Note on Fiber

Fiber is an important part of bowel management after SCI. You want to gradually decrease or increase your fiber intake and drink plenty of water to help avoid diarrhea or constipation if you are adjusting your fiber intake.

- Soluble fiber helps to firm stool and reduce diarrhea. Sources include oats, peas, beans, apples, citrus fruits, carrots, and barley.
- Insoluble fiber helps to prevent constipation and infections in the gut. Sources include whole-wheat flour; wheat bran; nuts; and beans and vegetables, such as cauliflower, green beans, and potatoes.

## Fats

You need healthy fats to give your body energy and support cell growth. They also help to protect your organs, keep your body warm, help your body absorb certain vitamins, and produce important hormones. Fats are high in calories and can add up quickly. Consuming more calories than you burn off—regardless of the calorie source—usually results in gaining body fat.

- “Healthier” unsaturated fats include monounsaturated and polyunsaturated fats. Foods high in healthier fats include vegetable oils (such as olive, canola, sunflower, soy, and corn), nuts, seeds, and fish.
- “Unhealthy” fats are high in saturated or trans fats. These fats lead to heart disease and stroke. Examples of unhealthy fats are hot dogs, poultry skin, bacon, sausage, high-fat



luncheon meats (such as salami and bologna), whole milk, butter, most fried foods and fast foods, and desserts and sweets made with lard, butter or tropical oils. Limit these fats to no more than about 5% of your total daily calories. High intake of unhealthy fats can lead to cardiovascular disease and can result to heart attacks or strokes.

- When deciding between fat sources, refer to the nutrition label (next page). Usually, the lesser saturated and trans-fat content, the better, and the more monounsaturated and polyunsaturated fats, the better.

## Vitamins and Minerals

Vitamins and minerals are essential to your health. Overall, natural sources offer the healthiest vitamins and minerals. A quality multivitamin supplement may be helpful, so talk to your health professional about whether a supplement is right for you.



- **Calcium:** It is the most abundant mineral in the body. Calcium is important for bone mass, and bone loss is common after SCI. This loss puts you at risk for developing osteoporosis as you age, especially if you are a woman. Proper calcium intake can help minimize that risk. Good sources of calcium include low-fat dairy foods like milk, cheese, yogurt, and non-dairy foods like seafood, leafy greens, legumes, dried fruit, and tofu.
- **Sodium:** Sodium (salt) affects blood pressure. Too much sodium can increase blood pressure and lead to health problems like heart disease and stroke. Too little sodium can lead to low blood pressure and other problems like muscle cramps, nausea, vomiting and dizziness. It is common for people to take in too much sodium by eating processed and fast foods. Instead, focus on fruits and vegetables, whole grains, and lean meats that are lower in sodium.
- **Vitamin D:** It is necessary for your body to absorb calcium for bone health. You get vitamin D in two ways. Direct sunlight is one natural source of vitamin D. However, you may not get enough vitamin D from sunlight. You can also eat fatty fish, fortified milk or milk alternatives, mushrooms, and lean meat to get vitamin D.
- **Vitamin B12, folic acid, and iron:** These help your body produce hemoglobin, which aids in getting enough oxygen in your body to maintain organ and tissue health. Good sources of B12 include lean meat, fish, poultry, and milk. Sources of folic acid include beans; peas; nuts; oranges and orange juice; and dark-green leafy vegetables, such as spinach and mustard greens. Sources of iron include lean meat, poultry, seafood, fortified cereals, white beans, lentils, and spinach.
- **Vitamin C and zinc:** These promote skin health. Vitamin C helps the body absorb iron more effectively and helps fight infections. Good sources of vitamin C include red pepper, orange juice, orange, kiwi, and broccoli. Sources of zinc include lean meat, liver, eggs, legumes, seafood, and milk.

## How Do I Change My Nutrition Habits?

You do not need to change everything in your diet. Start by understanding what is in your food and choosing healthier options. The Nutrition Facts Label is a good starting point.

**1.** Serving Information → 4 servings per container  
Serving size 1 cup (227g)

**2.** Calories → **Calories 280**

**3.** Nutrients →

Amount per serving	% Daily Value*
<b>Total Fat</b> 9g	12%
Saturated Fat 4.5g	23%
Trans Fat 0g	
<b>Cholesterol</b> 35mg	12%
<b>Sodium</b> 850mg	37%
<b>Total Carbohydrate</b> 34g	12%
Dietary Fiber 4g	14%
Total Sugars 6g	
Includes 0g Added Sugars	0%
<b>Protein</b> 15g	
Vitamin D 0mcg	0%
Calcium 320mg	25%
Iron 1.6mg	8%
Potassium 510mg	10%

**4.** Quick Guide to percent Daily Value (%DV) →

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



## Nutrition Facts Label

The nutrition facts label has information about the number of servings in a package, calories, fat, protein, sodium, and vitamins and minerals per serving.

- When choosing between similar foods, choose those higher in monounsaturated and polyunsaturated fats and lower in saturated and trans fats along with those with lower in sodium and sugars.
- % daily value is based on the diet of an average person who consumes 2,000 calories per day.
- More or fewer calories may be needed depending on your age, gender, weight, height, injury level, and physical activity level.

What I usually eat	Healthier options
Fried chicken or fish	Grilled or baked options with lower fat
Canned fruits in syrup	Fresh fruits or canned fruits in 100% juice
Regular bacon	Uncured, sugar-free, low sodium, or turkey bacon
Canned soup	Low-sodium versions of your favorite soup
Salt	Salt alternatives or use citrus, herbs and spices to add flavor to your meals
Chips, pretzels, or crackers	Roasted, lightly or unsalted nuts or baked and whole-grain versions of these snacks
Ice cream	Less sugar/lower fat ice cream, less sugar sorbet, frozen fruits
Whole-fat dressing	Low-fat version of the same dressing, citrus, or balsamic vinegar
Pizza	Thin crust with vegetable or grilled meat toppings
Sweet tea	Unsweetened tea or sweet tea mixed with unsweetened tea to reduce sugars
Deep fried food (fries, meat)	Baked or air-fried version to cut down fat
Spaghetti and meatballs	Whole grain pasta and turkey meatballs
Milk shake	Homemade smoothies using fruits as natural sweetener

## Is a Diet Change All I Need to Do to Be Healthy?

A healthy diet will improve your health, but you can increase your health benefits by combining a healthy diet with other lifestyle changes, such as including physical activities, limiting alcohol use and smoking, as well as maintaining good mental health.

- Alcohol affects your ability to perform daily activities of living and care, lowers your body's ability to fight infections, adds calories that can lead to weight gain, interacts with your medications, and disrupts your gut health.
- Smoking increases your risk for respiratory complications (pneumonia), cardiovascular complications (blood flow), cancer, osteoporosis (bone loss), pressure injuries, pain, and erectile dysfunction.



## Additional Resources

Your nutrition intake affects many secondary health conditions related to SCI. These resources can help you understand and manage those issues.



- To learn more about what a Registered Dietitian Nutritionist can do for you, visit <https://www.eatright.org>.
  - EatRight® SCI Weight Management Program—visit <https://www.uab.edu/medicine/sci/uab-scims-information/eatright-weight-management-program>.
- To learn more about physical activities, read [Adaptive Sports and Recreation | MSKTC](#) and [Exercise after Spinal Cord Injury](#).
- To learn more about bone loss, read [Bone Loss After Spinal Cord Injury](#).
- To learn more about respiratory health, read [Respiratory Health and Spinal Cord Injury](#).
- To learn more about pregnancy care, read [Pregnancy and Women with Spinal Cord Injury](#).
- To learn more about skin care, read [Skin Care and Pressure Sores in Spinal Cord Injury](#).
- To learn more about spasticity, read [Spasticity and Spinal Cord Injury](#).
- To learn more about urinary tract infection, read [Urinary Tract Infection and Spinal Cord Injury](#).
- To learn more about constipation, read [Bowel Function and Spinal Cord Injury](#).
- To learn more about cardiovascular risk, read [Aging with Spinal Cord Injury](#).

### **Nutritional Needs Table (next page)**

The nutritional needs table on the next page guides you in promoting overall health and improving everyday problem issues with your bowel, bladder, skin, bone, and muscle.

1. Column 1 offers a list of nutrients that are key to overall health.
2. Column 2 offers checkmarks that tell you what nutrients affect infections (Immune System).
3. Column 3 offers checkmarks that tell you what nutrients affect bowel management.
4. Column 4 offers checkmarks that tell you what nutrients affect skin care and wound healing.
5. Column 5 offers checkmarks that tell you what nutrients affect muscle and bone health.
6. Column 6 provides examples of dietary sources.





**Nutritional Needs Table**

Infection (Immune System)	Bowel Management	Skin Care/Wound Healing	Muscle and Bone Health	Cardiovascular Health	Pulmonary Health	Diabetes Prevention
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Number key:

1. Increase intake if urine is too dark or decrease intake if urine is too clear.
2. Increase intake with diarrhea or constipation.
3. Adjust gradually if needed.

Nutrients	Examples of dietary sources							
Water	✓ <sup>1</sup>	✓ <sup>2</sup>	✓				Water, non-sugar-sweetened beverages	
Protein			✓	✓			✓	Lean meat, nuts, beans and legumes, fish and seafood, low-fat dairy products
Fiber		✓ <sup>3</sup>			✓	✓		Fruits and vegetables, whole grains, legumes, nuts, seeds
Calcium				✓			✓	Dairy products and calcium-fortified dairy alternatives, leafy green vegetables, broccoli, tofu, salmon
Folic acid			✓		✓			Dark-green leafy vegetables, fortified cereals, flour
Iron			✓					Lean meat and seafood, iron-fortified cereal and instant oatmeal, nuts, beans
Zinc	✓		✓	✓		✓	✓	Oysters, low-fat roast beef and poultry, crab, lobster, beans, nuts
Magnesium	✓			✓	✓	✓	✓	Green leafy vegetables, legumes, nuts, seeds, whole grains
Potassium				✓	✓		✓	Fruits and vegetables, legumes (e.g., soybeans), and potatoes
Vitamin A	✓				✓	✓		Liver, fish oils, milk, eggs, vegetables, fruits, fortified cereals
Vitamin B6	✓		✓					Fish, beef liver and other organ meats, potatoes, non-citrus fruits, fortified cereals
Vitamin B12			✓					Lean meat, low-fat dairy products, fortified cereals, yeast
Vitamin C	✓		✓	✓		✓		Citrus, tomatoes, potatoes, bell peppers, kiwifruit, broccoli, strawberries, Brussels sprouts, cantaloupe
Vitamin D	✓			✓		✓	✓	Fatty fish, UV-treated mushrooms, fortified dairy products and cereals
Vitamin E	✓					✓		Nuts, seeds, vegetable oils, green leafy vegetables, fortified cereals
Vitamin K				✓			✓	Green leafy vegetables, canola oil



## Authorship

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**Disclaimer:** This information is not meant to replace the advice of a medical professional. You should consult your health care provider regarding specific nutritional needs, medical concerns or treatment. The contents of this factsheet were developed under grants from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant numbers 90DPKT0009, 90SIMS0020, 90SIMS0006, and 90SIMS0014). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this fact sheet do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the federal government.

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