GUIDE

NSW State Spinal Cord Injury Service

Nutrition for Adults with Spinal Cord Injury

NSW GOVERNMENT

AGENCY FOR CLINICAL INNOVATION

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Introduction

After a spinal cord injury (SCI), it is particularly important to eat well and stay within a healthy weight range.

This resource provides information about:

- importance of maintaining a healthy weight after a SCI, and how to determine a healthy weight
- the *Australian Dietary Guidelines and Australian Guide to Healthy Eating*
- how diet impacts the health of your bowels, bladder, skin and bones.

Having nutrition information is the first step towards healthy eating, but changing your eating habits can be difficult. Convenience, access, cost, preparation and taste preferences are all factors in how and what we eat. Healthier eating may take some adjustment, but it can be done. Your healthcare providers, including a dietitian, can provide advice and help you make the changes gradually.

Maintaining a healthy weight

Weight changes after a spinal cord injury

After a SCI, you may experience weight changes.

Initially, you may experience some weight loss. An average amount of weight loss for men and women is 4–9 kg. This is due to:[1]

- **stress on the body** – the initial injury can put great strain on your body, increasing the rate at which you use/burn kilojoules (energy)
- **paralysed muscles** – muscles that aren't used reduce in size. As men generally have a larger amount of muscle, they tend to lose more weight than women after a SCI.

This initial weight loss usually slows down after 3–4 weeks, then you may start to gain weight. This weight gain may be due to:

- **a reduced ability to move around** – less activity and exercise burns less kilojoules
- **changes in your metabolism** – smaller muscles slow down the rate at which your body burns kilojoules (metabolism).[2]

You may find that your body stores weight differently than it did before your injury. The amount of muscle in your body decreases and fat may increase in the parts of your body that are paralysed. The weight often settles in the abdominal areas while the legs often lose their muscle mass and appear skinny. You may find that you have to adjust your ideas about body shape.

Table 1. Benefits of maintaining a healthy weight

Benefit	What it means for you
Reduced risk of health problems related to excess weight	Reduces your risk of developing: • diabetes • heart disease • high blood pressure • stroke • sleeping problems • respiratory disorders • some cancers.
Reduced risk of health problems related to being underweight	• Prevents malnutrition. • Cushions your bones (particularly sitting bones) to prevent pressure injuries. • Helps maintain healthy skin to prevent skin breakdown and pressure injuries. • Maintains your muscle strength for transfers.
Improved muscle strength and energy levels	Maintains your independence by: • improving mobility • making transfers easier.
Healthy skin	Reduces the risk of developing pressure injuries and therefore means you have: • fewer hospital visits • fewer periods of long bed rest • prevent need for antibiotics • prevent need for surgery.
Maintaining equipment and home modifications	Decreases costs from needing to accommodate weight changes: • equipment (e.g. bariatric chairs, beds and mattresses) • home modifications • accommodation.
Access to public transport	Maintains your independence and ability to access public transport (ramps on buses, trains and taxis have weight limits). Note: the combined weight of you and your wheelchair should not exceed a certain weight (applies especially to power wheelchair users as these weigh more than manual wheelchairs).
Psychological wellbeing	Can improve self-esteem, poor body image and depression

Determining a healthy weight

When you have a SCI, your healthy weight range is lower than that for the general population. This is because the muscle loss that occurs after a SCI is taken into consideration.

In general, if you were a healthy weight before your SCI, then a healthy weight now is 4–9 kg less. Compared to the general population average (same gender, age and height):

- people with paraplegia should weigh about 5–10% (or 4.5–7 kg) less than the general population
- people with tetraplegia should weigh 10–15% (or 7–9 kg) less than the general population.[1]

Table 2 provides a general idea of what a healthy weight range is for your height, age and level of SCI injury.

Individualised factors need to be taken into account when determining a healthy weight range. These include your previous weight history, gender, age and cultural background.

Your dietitian is able to take these other important factors into consideration in determining a realistic healthy weight range for you.

Table 2. General healthy weight ranges for height and injury level[3-4]

Height	General Population (kg)		Paraplegia (kg)		Tetraplegia (kg)	
	Under 65 years	Over 65 years	Under 65 years	Over 65 years	Under 65 years	Over 65 years
146 cm (4'9.5")	39–53	51–64	32–49	44–60	30–46	42–57
148 cm (4'10")	41–55	53–66	34–51	46–62	32–48	44–59
150 cm (4'11")	42–56	54–68	35–52	47–64	33–49	45–61
152 cm (5'0")	43–58	55–69	36–54	48–65	34–51	46–62
154 cm (5'0.5")	44–59	57–71	37–55	50–67	35–52	48–64
156 cm (5'1.5")	45–61	58–73	38–57	51–69	36–54	49–66
158 cm (5'2")	46–62	60–75	39–58	53–71	37–55	51–68
160 cm (5'3")	47–64	61–77	40–60	54–73	38–57	52–70
162 cm (5'4")	49–66	63–79	42–62	56–75	40–59	54–72
164 cm (5'4.5")	50–67	65–81	43–63	58–77	41–60	56–74
166 cm (5'5")	51–69	66–83	44–65	59–79	42–62	57–76
168 cm (5'6")	52–71	68–85	45–67	61–81	43–64	59–78
170 cm (5'7")	53–72	69–87	46–68	62–83	44–65	60–80
172 cm (5'8")	55–74	71–89	48–70	64–85	46–67	62–82
174 cm (5'8.5")	56–76	73–91	49–72	66–87	47–69	64–84
176 cm (5'9")	57–77	74–93	50–73	67–89	48–70	65–86
178 cm (5'10")	59–79	76–95	52–75	69–91	50–72	67–88
180 cm (5'11")	60–81	78–97	53–77	71–93	51–74	69–90
182 cm (5'11.5")	61–83	79–99	54–79	72–95	52–76	70–92
184 cm (6'0.5")	63–85	81–102	56–81	74–98	54–78	72–95
186 cm (6'1")	64–86	83–104	57–82	76–100	55–79	74–97
188 cm (6'2")	65–88	85–106	58–84	78–102	56–81	76–99
190 cm (6'3")	67–90	87–108	60–86	80–104	58–83	78–101
192 cm (6'4")	68–92	88–111	61–88	81–107	59–85	79–104
194 cm (6'5")	70–94	90–113	63–90	83–109	61–87	81–106
196 cm (6'6")	71–96	92–115	64–92	85–111	62–89	83–108
198 cm (6'7")	73–98	94–118	66–94	87–114	64–91	85–111

My healthy weight range is: _____ kg

Managing your weight

Weight gain can lead to being overweight or obese, which can cause health problems. It can be extremely challenging to maintain a healthy weight and avoid gaining weight after a SCI, but it is achievable, and doing so can help to optimise your quality of life.

Being underweight also carries many serious health risks that include malnutrition, pressure injuries and infections.

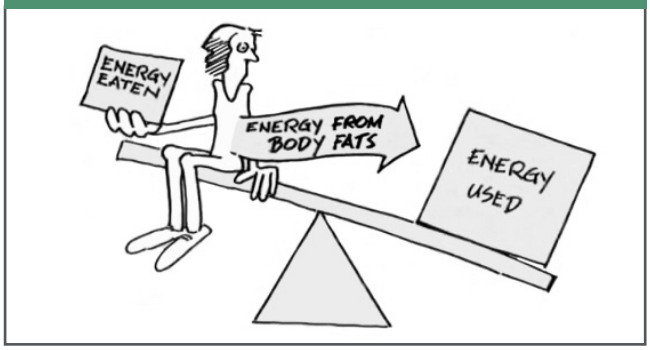
Making a commitment to maintaining a healthy weight is one of the best things you can do for your health and wellbeing. The key to achieving and maintaining a healthy weight is to enjoy healthy eating and being active every day. When your weight changes it generally comes down to two factors:

1. how much you eat and drink (energy in)
2. how active you are (energy out).

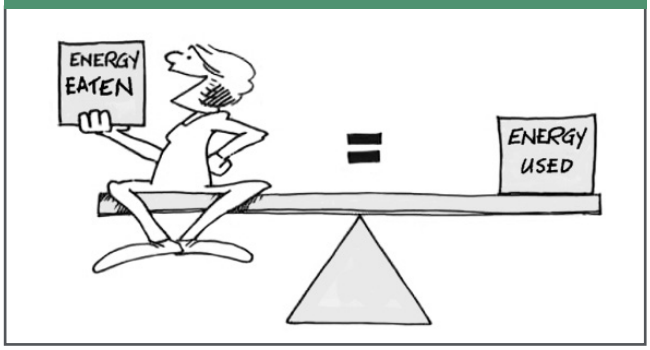
To maintain a healthy weight, you may need to adjust your diet, including the kilojoules you consumer each day, compared to before your injury. It's all about achieving a balance.

Figure 1. Managing your weight

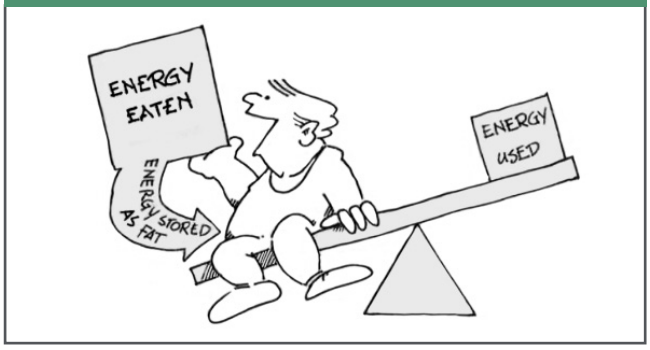
For weight loss



For weight maintenance



For weight gain



Source: Weigh up your future[5]

Making healthy choices

The Australian Dietary Guidelines and the Australian Guide to Healthy Eating were developed using the latest scientific evidence to help people make healthy food choices.[3]

The Australian Dietary Guidelines have information about types and amounts of foods, food groups and dietary patterns. They provide recommendations that help you to eat well by including foods in your diet that have great nutritional value while moderating the amount of kilojoules.

The following three dietary guidelines can help people with SCI to:

- improve quality of life and wellbeing
- prevent weight gain and/or help lose weight
- protect against developing pressure injuries
- keeping bowel, bladder and bones healthy.

GUIDELINE 1

To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious food and drinks to meet your energy needs.

Physical activity can improve blood cholesterol levels and decrease weight in people with a SCI.[6] Try to be active in any way you can, whether it's wheelchair sports, swimming or exercises provided by your physiotherapist or exercise physiologist.

Energy and protein

A healthy diet is very important for achieving and maintaining a healthy weight, muscle strength, quality of life and longevity.

Individuals with tetraplegia need to eat fewer kilojoules than individuals with paraplegia, as they have a greater amount of muscle loss. For example, a 65kg male with paraplegia requires around 7600 kilojoules per day to maintain his weight, whereas a male of the same weight with tetraplegia requires around 6200 kilojoules per day, around 1400 kilojoules less.[7]

Your daily protein needs are the same as the general population. The need for extra protein in your diet will occur with certain health conditions, for example if you develop a pressure injury.

Your dietitian will take into consideration your level of injury and healthy weight range when determining the recommended amount of kilojoules and protein you require on a daily basis.

My daily energy intake should be: _____ kilojoules per day

My daily protein intake should be: _____ grams per day

Water

Drinking enough fluid is an essential part of a healthy diet. Water is an important nutrient that most people do not think about when planning their diet.

The role of water includes:

- carrying food waste out of your body
  - helping prevent constipation by keeping the stool soft
  - helping prevent catheter tube blockages, urinary tract infections and renal stones
- carrying food nutrients through your body
- helping regulate your body temperature through sweating
- helping keep your skin healthy.

There is no single recommended amount of daily fluid intake, as everyone's fluid needs are different and need to be assessed on an individual basis. This is because the amount of fluid that you need depends on many factors like:

- your medical background and certain health conditions
- your weight
- your diet (especially the amount of fibre you eat)
- medications you may be taking
- if you self-catheterise or have an indwelling catheter
- the climate you live in (more fluid is needed in hot weather)
- your level of physical activity.

This means that certain people may need to decrease the amount of fluid that they drink, while others may need to increase it.

In general, people with a SCI should drink about half a litre more per day than the general population to help assist with keeping bowels and bladder healthy.[8]

When selecting what you drink, remember that if you are watching your weight, avoid fluids with kilojoules (juices, milkshakes and soft drinks) and go for water or diet drinks instead. Water has no kilojoules and therefore will not contribute to weight gain.

Your doctor or dietitian can recommend the amount of fluid you need drink per day.

GUIDELINE 2

Enjoy a wide variety of nutritious foods every day from the five food groups.

The Australian Guide to Healthy Eating is a food selection guide that visually represents the proportion of the five food groups recommended for consumption each day.[7]

The five food groups make up the central 'plate' (or main circle) on the Australian Guide to Healthy Eating below. Foods are grouped by types and the nutrients they provide to your diet.

Choosing a variety of foods from the different five food groups, as well as from within each food group, increases your chances of getting adequate amounts of all your essential nutrients.

Figure 2. Australian Guide to Healthy Eating

Source: The Australian Guide to Healthy Eating[3]

My daily fluid intake should be: _____ litres per day

Fruits and vegetables

The *Australian Dietary Guidelines* recommend that each day your diet should include two servings of fruits and 5–7 servings of vegetables.[7] Serving sizes are outlined below.

A dietitian may individualise the number of serving sizes for you, based on your health needs.

Fruits and vegetables are beneficial because they:

- ✔ provide vitamins, minerals and fibre
- ✔ are generally low in kilojoules
- ✔ help to 'fill you up' to avoid excess weight gain
- ✔ help to keep your bowels healthy.

Different fruits and vegetables contain a range of nutrients that can help protect the body in different ways. To ensure your food provides a good selection of nutrients, it is important to choose a variety of different coloured fruit and vegetables. Fresh, frozen and canned varieties are all healthy and nutritious options.

Table 3. A serving of fruit		
Medium sized fruit (e.g. apple, banana, orange or pear)	**1**	
Small sized fruit (e.g. apricots, kiwi fruits or plums)	**2**	
Diced or canned fruit (no added sugar)	**1 cup**	

Source: The Australian Guide to Healthy Eating[7]

Table 4. A serving of vegetables		
Cooked vegetables (e.g. broccoli or carrots)	**half cup**	
Cooked dried or canned beans, peas or lentils (without added salt)	**half cup**	
Raw salad vegetables	**1 cup**	
Potato or other starchy vegetables (e.g. sweet potato, taro or sweet corn)	**half medium potato or half cup**	

Source: The Australian Guide to Healthy Eating[7]

My daily serves of fruit should be: _____ serves

My daily serves of vegetables should be: _____ serves

Grain (cereal) foods

The Australian Dietary Guidelines recommend that each day your diet should include 3–6 servings of grain (cereal) foods.[7]

A dietitian may individualise the number of serving sizes for you, based on your age and other health needs.

Grains are beneficial because they:

✔ provide vitamins, minerals and fibre
✔ keep your digestive system healthy
✔ help protect against excessive weight gain by making you feel full for longer.

Wholegrain varieties are the healthier choice as they contain more fibre, vitamins and minerals and healthier fats than refined 'white' grain products such as white flour, white rice or pasta.

Table 5. A serving of grain (cereal) food		
Slice of bread	**1**	
Medium roll or flat bread	**half**	
Cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa	**half cup**	
Cooked porridge	**half cup**	
Wheat cereal flakes	**two thirds of a cup**	

Table 5. A serving of grain (cereal) food		
Muesli	one quarter cup	
Crisp breads	3	
Small crumpet or English muffin	1	

Source: The Australian Guide to Healthy Eating[7]

My daily serves of grain (cereal) foods should be: _____ serves

Lean meat and poultry, fish, eggs and/or plant-based alternatives

The Australian Dietary Guidelines recommend that each day your diet should include 2–3 servings of lean meat and poultry, fish, eggs and/or plant-based alternatives.[7]

A dietitian may individualise the number of serving sizes for you, based on your health needs.

These foods are beneficial because they:

✔ provide protein, iron, zinc and B group vitamins
✔ help prevent skin breakdown and pressure injuries
✔ help maintain lean muscle mass.

Plant-based alternatives are important for those who follow a vegetarian or vegan diet.

Fresh, frozen and canned varieties of meats, poultry or fish are all suitable. When using canned varieties, choose options with no added salt.

Grill, bake, sauté, boil, microwave, barbeque, poach, steam or stir fry rather than shallow or deep frying and roasting in oil so that you don't use a lot of fat.

Table 6. A serving of lean meat, poultry, fish, eggs and/or plant-based alternatives

Lean red meats (beef, lamb, veal, pork, goat or kangaroo)	**65g cooked or 90-100g raw**	
Skinless chicken or turkey (poultry)	**80g cooked or 100g raw**	
Fish fillet	**100g cooked or 115g raw**	
Tinned fish	**1 small can**	
Eggs	**2 large (120g)**	

Table 6. A serving of lean meat, poultry, fish, eggs and/or plant-based alternatives		
Cooked or canned legumes/beans such as lentils, chickpeas or split peas	1 cup (150g)	
Tofu	170g	
Nuts, seeds, peanut or almond butter or tahini or other nut or seed paste	30g	

Sources: Plating It Up: The Portion Guide. Victoria, Australia[9], The Australian Guide to Healthy Eating[7]

My daily serves of lean meat, poultry, fish, eggs and or plant-based alternative foods should be: _____ serves

Milk, yoghurt, cheese and/or alternatives

The Australian Dietary Guidelines recommend that each day your diet should include 2.5–4 serves of milk, yoghurt, cheese and/or alternatives.[7]

A dietitian may individualise the number of serving sizes for you, based on your health needs.

These foods are beneficial because they:

✔ provide protein, calcium and vitamins A, B and D

✔ help to reduce cholesterol and avoid excess weight gain (low-fat varieties)

✔ reduce risk of osteoporosis.

Choose reduced-fat, low-fat or no-fat (skim) varieties of milk, cheese and yoghurt.

Table 7. A serving of milk, yoghurt, cheese

Milk (fresh, UHT long life, reconstituted powdered milk or buttermilk)	**1 cup (250ml)**	
Evaporated milk	**half cup (120ml)**	
Cheese, hard (e.g. cheddar)	**2 slices (40g)**	
Cheese, soft (e.g. ricotta)	**half cup (120g)**	
Yoghurt	**three quarters of a cup (200g)**	
Soy, rice or other cereal drink (with at least 100mg of added calcium per 100ml)	**1 cup (250ml)**	

Source: The Australian Guide to Healthy Eating[7]

The alternative foods contain about the same amount of calcium as a serve of milk, yoghurt or cheese.

Table 8. A serving of alternatives		
Almonds with skin	**100g**	
Sardines, canned in water	**60g**	
Canned pink salmon with bones	**half cup (100g)**	
Firm tofu (check labels as calcium levels vary)	**100g**	

Source: The Australian Guide to Healthy Eating[3]

My daily serves of milk, yoghurt, cheese and/or alternatives should be: _____ serves

GUIDELINE 3

Limit intake of foods containing added salt, saturated fat, added sugars and alcohol.

These foods and drinks appear in the bottom right-hand corner of the Australian Guide to Healthy Eating. They are called 'discretionary choices' because they are not part of an everyday healthy diet. This is because they are high in kilojoules, unhealthy saturated fat, added sugars and/or salt or alcohol.

While discretionary choices can help contribute to the overall enjoyment of eating, often as part of social activities and family or cultural celebrations, you need to eat these foods less often and in much smaller amounts and greatly increase your exercise to 'burn off' the added kilojoules to prevent gaining weight.

When you have a SCI, there may be little or no room in your usual dietary pattern for any discretionary choices at all. Or, if you do have these types of foods, the portion size may need to be quite small.

Added salt

Salt can help enhance flavour and preserve some foods. Salt is the main source of sodium in our diet and too much sodium is not good for health. Cutting down on sodium reduces blood pressure and risk of heart disease and stroke.

Most sodium we eat comes from the salt added to processed foods.

- Choose packaged foods with labels stating they contain 'no added salt' or have low or reduced salt (or sodium).
- Try to resist adding salt at the table and in cooking. Instead, add flavour with fresh or dried herbs and spices. Pepper, basil, lemon grass, ginger or garlic are healthy and provide delicious flavour.
- Cut down on added salt gradually. Train your taste buds to enjoy less salty food.

Types of fat

Different types of fats have different effects on our health. In general there are two types of fats in foods: saturated (unhealthy fats) and unsaturated (healthier fats).

Table 9. Saturated and unsaturated fats

Saturated fats	Unsaturated fats
Increase your risk of heart disease by increasing the 'bad' LDL cholesterol in your blood Sources included animal foods and in plant foods like palm and coconut oil. Examples of foods that contain saturated fats include: • processed meats such as bacon, ham, frankfurts or salami • full-fat dairy products • fatty or fried takeaway foods • cakes and biscuits • butter and cream • fat on meats and chicken skin • pastry • coconut oil and coconut milk • palm oil • lard, dripping and gravy • potato chips and crisps.	A healthy balanced diet should include small amounts of healthy unsaturated fats. They are essential for good health because: • they contain vitamins • they lower your risk of getting heart disease by reducing the 'bad' LDL cholesterol and increasing the 'good' HDL cholesterol in your blood. Examples of foods that contain unsaturated fats include: • oily fish • avocado • oils and margarines made from olives, nuts and seeds (e.g. olive oil, canola, sunflower or safflower) • nuts and seeds • lean meats, poultry and eggs • reduced-fat dairy products • legumes and beans • rice bran • olives.

Both healthy and unhealthy fats are high in kilojoules, so it is important to only eat small amounts of even the healthy fats.

Added sugars

It's not the naturally occurring sugars in fruit, vegetables or milk products that are a problem. It's the foods and drinks with sugars added as a sweetener, flavour enhancer or preservative that you need to limit.

Added sugars can increase the kilojoule content of your diet. They can also reduce your intake of important nutrients if you eat these foods in place of foods from the five food groups.

Intake of the following foods can increase the risk of excessive weight gain:

- energy drinks
- fruit drinks
- sports drinks
- sweetened soft drinks and cordials
- sweetened waters, iced teas
- jams, marmalade
- syrups, sweetened sauces and dressings
- sugar
- sugar confectionary
- honey
- biscuits, cakes, sweet muffins, doughnuts, slices, puddings, sweet pastries, pies and crumbles
- chocolate.

To limit added sugars, train your tastebuds to rely less on sweetness by gradually reducing the sugar you add to foods and your intake of foods containing added sugar. You can also try to gradually cut out sugar added to hot drinks and/or use artificial sweeteners.

Alcohol

Alcohol is considered a food as well as a drug. Alcoholic drinks such as beer, wine, spirits and fortified wine are high in kilojoules. Sugar-sweetened alcoholic drinks add a further risk for excessive weight gain.

If you choose to drink alcohol, limit your intake. It is recommended that you drink no more than two standard drinks on any one day.[10]

In Australia, all bottles, cans and casks containing alcoholic beverages are required by law to state on the label the approximate number of standard drinks they contain.

Table 10. Standard serves for alcoholic drinks

Alcoholic beverage	% Alcohol	Volume	No. of standard drinks
Low-strength beer	2.7%	375ml = 1 can	0.8
Mid-strength beer	3.5%	375ml = 1 can	1
Full-strength beer	4.9%	375ml = 1 can	1.4
Wine	9.5–13%	100ml glass 150ml (average restaurant serving)	1 1.4–1.6
Spirits	37–40%	30ml = 1 nip	1
Spirits, pre-mixed	5–7%	375ml = 1 can	1.5–2.1

Source: Australian Guidelines to Reduce Health Risks from Drinking Alcohol[10]

Figure 3. What does a standard drink look like?

What does one standard drink (100ml) of wine look like in different sized glasses?

Sources: Standard Drink Tool[11], Australian Guidelines to Reduce Health Risks from Drinking Alcohol[10]

What does one standard drink (265ml) of full-strength beer look like in different sized glasses?

		
285 ml middy glass	**425 ml schooner glass**	**570 ml pint glass**

Sources: Standard Drink Tool[11], Australian Guidelines to Reduce Health Risks from Drinking Alcohol[10]

Tips for weight control

Making small, easy changes to your lifestyle so they become the norm is the best approach for weight loss. Small changes can lead to big improvements. The following are some strategies that can help with healthy eating and weight loss.

Allow time

Allow plenty of time to plan, shop and cook your meals

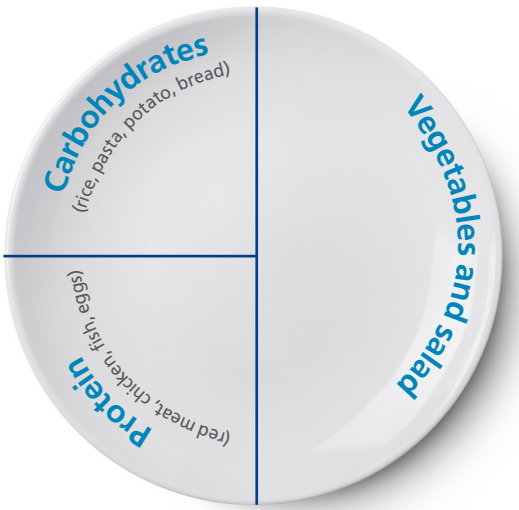
- A good meal plan and shopping list can help you make healthier food choices, reduce stress and save time and money.
- Avoid shopping when you are hungry as this can help reduce unhealthy impulse purchases.
- There are a variety of websites and applications that can assist you with weekly menu planning, such as Taste, Pepperplate and Paprika.
- Think about how much time you or your carers have to prepare meals. If you are new to cooking, start with simple recipes.
- Try cooking methods that reduce kilojoules. For example, cook without adding fat, use non-stick cooking sprays and choose low kilojoule foods when possible.

Awareness

Be aware of how much food you can eat without gaining weight and try not to go over this amount

- **Watch your portion sizes** – Divide up your plate: half of it should be vegetables; a quarter should be meat or other protein; and about a quarter should be a starchy vegetable (e.g. potato, corn or sweet potato) or a cereal (grain) food (e.g. rice, pasta or bread). See Figure 4 for an example of how the food on your plate should look.
- **Dining out** – Eating out or buying takeaway is very convenient; however, it is also the most expensive and least healthy way to eat. Restaurant serving sizes are often much larger than we need, so we tend to overeat when we go out. When eating out, make healthy choices. For example, choose grilled or steamed foods and avoid creamy sauces.
- **Watch your beverage calories** – It's very easy to use up a large portion of your daily calorie intake in beverages. Choose water instead of soft drink, cordial, fruit drinks, vitamin waters, energy drinks, sports drinks, milkshakes or alcoholic drinks.

Figure 4. Portion size guide



Source: Plating It Up: The Portion Guide[9]

Source: Healthy Eating for Individuals with Spinal Cord Injury in Rehabilitation[12]

Activity

Be physically active every day in as many ways as possible

Your physiotherapist or exercise physiologist can recommend the right exercise for you.

Eat regular meals

- Avoid skipping meals, as this leads to snacking and overeating later. It's better to spread out your food consumption throughout the day to control your appetite.
- Routinely eat 2–3 meals per day.
- Eat slowly and savour every mouthful. Listen to your body. Stop before you feel full.

Read food labels (packaged food)

- Among other things, food labels give you information on what the serving size is for that food, how many serving sizes are in that packet and the amount of kilojoules it provides per serving.
- There are many smartphone apps that can assist you with reading food labels, e.g. FoodSwitch helps you at the point of purchase to make healthier food choices.

Recognise triggers

- Recognise if you use eating to deal with feelings other than hunger, such as boredom, being tired, feeling down or stressed and develop a plan to deal with this.
- Find a friend or family member to help support you to eat healthily and be active.

Monitor your weight

- It may be hard to find a place to be weighed regularly, but it's important to know if you are gaining or losing weight. If you're just getting weighed once a year during your annual visit, you don't get the feedback you need about whether you are eating too much. Try to find a clinic or gym with a wheelchair or hoist scale where you can get weighed at least once per month.
- Use your clothes as a guide, if they are getting too tight you are probably gaining weight and need to adjust your food choices and physical activity levels.

Table 11. My weight: personal record

Date	Weight	Comments

Diet and bowels

After a SCI, there are many changes that may occur with your bowels.

- More time may be required for food to move through your digestive system.
- The nerves in your bowel may not able to communicate messages that your bowel is full and that it is time to empty your bowels.
- There may be altered control over the muscles that control your bowel function.

The degree of loss will depend on:

- the level and extent of the SCI
- your bowel habits before the injury
- any pre-existing medical conditions.

Bowel problems can significantly impact on your quality of life. Following a bowel management program can help avoid complications and problems like constipation, unplanned bowel movements or autonomic dysreflexia. Although a bowel management program is individualised, diet plays an important role in any bowel management program. Consuming enough fibre and fluid on a daily basis is essential for a successful bowel management program.

Fibre

Fibre is the part of fruits, vegetables, grains, nuts and seeds that our bodies can't digest. It helps the body's digestive system work well and keep food moving through.

There are two types of fibre: soluble and insoluble. Both are essential for good health. Most sources of dietary fibre tend to have a combination of both types in varying proportions.

Table 12. Types of fibre

	Insoluble fibre	Soluble fibre
Description	Usually referred to as roughage.	Dissolves and thickens in water to form a gel.
Sources	• fruit (e.g. apple, banana and strawberries) • vegetables • nuts • seeds • grains • wholegrain breads and cereals	• fruits (e.g. orange, mango and prunes) • oats • barley • legumes (e.g. baked beans and lentils) • psyllium husks
Benefits	• Speeds up the rate of food moving through your digestive system. • Helps with preventing and treating constipation by adding bulk to your stools and absorbing water and making stools softer.	• Slows down the rate of food moving through your digestive system. • Helps with preventing and treating loose stools by forming a gel in your gut, making stools easier to pass. • Can reduce blood cholesterol levels. • Can help with weight loss by making you feel fuller for longer.

How much fibre do I need?

The amount of fibre you need depends on your level of injury, but trying to have 15–20g fibre per day is a good starting point.[12-13]

A fibre intake of greater than 20g per day may cause your stools to move too slowly through your digestive tract.

If you are increasing your fibre, do so gradually. Too much too fast can cause digestive discomfort like gas, cramps and diarrhoea. When you increase fibre in your diet, you must also increase your fluid intake. Fibre pulls fluids from your body and if fluid is not replaced, it may lead to constipation.

Table 13. Basic fibre counter

Food	Fibre content
Fruit, one piece average size	2–3g
Vegetable, half cup cooked	1–3g
Cereal, high fibre 1 cup	3–5g
Cereal, low fibre 1 cup	0.5g
Porridge, 1 cup	5–6g
Nuts, 10 whole	1–3g

Table 14. Bowel conditions: What to do if you are experiencing…

Loose stools and/or bowel accidents	Constipation	Feeling bloated
• Ensure you are drinking the right amount of fluid • Decrease insoluble fibre and increase soluble fibre, e.g. – eat white bread instead of grainy bread – eat porridge instead of wholegrain cereal – eat white instead of wholemeal pasta • Limit spicy foods, e.g. hot curries and chilli • Limit high fat foods • Avoid pears and prunes • Limit alcohol and caffeine, as they can affect consistency of the stool	• Ensure you are drinking the right amount of fluid • Decrease soluble fibre and increase insoluble fibre, for example – eat grainy bread instead of white bread – eat wholegrain cereal instead of porridge – eat wholemeal instead of white pasta • Make sure you also eat your recommended serves of fruit and vegetables per day • Pears or pear juice, pawpaw and prunes may be helpful	• Avoid constipation • Spread your fibre intake throughout the day • Do not have just one type of food for a meal, e.g. fruit only • Eat a variety of all foods at each meal

Fluid

Drinking enough fluid is also important for your bowel management program. When you are eating adequate amounts of fibre, fluid helps move the stool through the digestive tract by keeping the stool soft.

Water is the best choice. Refer to the section on Water for more information.

Diet and pressure injuries

Prolonged pressure on your skin and the underlying tissue causes it to lose condition. If the pressure is not relieved your skin can break down, producing a pressure injury. If not treated, a pressure injury can become a medical emergency and lead to a prolonged hospital stay.

Having a SCI and/or obesity are two important factors that can increase your risk of developing a pressure injury. This is due to your inability to change body position to reduce pressure on the skin. Malnutrition and being underweight are also large risk factors for developing pressure injuries.

Nutrition plays a major role in preventing and treating pressure injuries. You can reduce your risk of pressure injury by:

- being a healthy weight
- ensuring adequate nutrition and hydration
- shifting off your weight or being turned regularly
- using pressure-relieving mattresses and cushions.

Protein is important for tissue growth, maintenance and repair. If you do not have a pressure injury, the amount of protein you need every day is the same as the general population. However, if you have a pressure injury the amount of protein, kilojoules and fluid you need every day is increased.[14]

It is very important to see a dietitian, who will be able to work out your nutrition needs for wound healing and give you individual advice. This will be based on:

- your weight
- the severity of your pressure injury
- other medical conditions that you may have.

If your dietary intake is inadequate for wound healing, your dietitian may also recommend nutritional supplements.

Bone health

Osteoporosis is a condition that occurs when bones lose minerals such as calcium more quickly than the body can replace them. The term literally means 'bones with holes'.

People who have osteoporosis become weak, fragile and break more easily. Often there are no symptoms until the first fracture occurs.

Osteoporosis is a complication of having a SCI. It mainly occurs in the pelvis and legs. The first signs of osteoporosis can appear as early as six weeks after having a SCI.[15]

It is important to reduce bone loss by eating enough serves per day of calcium-rich foods. Daily calcium recommendations are 1000mg per day for adults. Women over 50 and men over 70 need 1300mg of calcium per day.[16]

Eating the recommended 2.5–4 serves of the food group Milk, Yoghurt, Cheese and/or Alternatives, will provide you with your daily calcium needs. The amount you need depends on your age and health needs.

Vitamin D deficiency can also contribute to osteoporosis because vitamin D helps the body to absorb calcium. It is important to have your vitamin D levels checked regularly by your doctor. If your levels are low, your doctor can recommend the best way to supplement your vitamin D.

Table 15. Calcium-rich foods

Calcium-rich food	Calcium content
Milk (reduced fat), 1 cup (250ml)	275mg
Cereal milk drink (e.g. soy or rice milk) fortified with calcium, 1 cup (250ml)	300mg
Yoghurt (reduced fat), ¾ cup (200g)	350mg
Cheese, cheddar (reduced fat), 2 slices (40g)	350mg
Salmon, with bones, canned ½ cup (100g)	200mg
Tofu, firm 100g	320mg
Almonds (with skin), 100g	250mg

Further information

Pain Management: Lifestyle and Nutrition

http://www.aci.health.nsw.gov.au/chronic-pain/for-everyone/pain-lifestyle-and-nutrition

Australian Dietary Guidelines: Healthy Eating for Adults

https://www.eatforhealth.gov.au/sites/default/files/files/the_guidelines/n55g_adult_brochure.pdf

Australian Department of Health and Ageing: How to Understand Food Labels

https://www.eatforhealth.gov.au/sites/default/files/files/eatingwell/efh_food_label_example_130621.pdf

Sample meal plans

Meal/Food	Portion Size	Food group and number of serves
Breakfast		
Wholegrain breakfast cereal with reduced fat milk	60g cereal 1 cup (250ml) reduced fat milk	2 grain serves 1 milk and/or alternatives serve
Reduced fat yoghurt	100g yoghurt	½ milk and/or alternatives serve
Morning Break		
Coffee with milk	200ml (small coffee)	¼ milk and/or alternatives serve
Lunch		
Sandwich with salad and chicken	2 slices bread 40g chicken 1 cup salad vegetables	2 grain serves ½ meat and/or alternatives serve 1 vegetable serve
Apple	1 medium	1 fruit serve
Afternoon Break		
Unsalted nuts **Coffee with milk**	30g (small handful) 200ml (small coffee)	1 meat &/or alternatives serve ¼ milk and/or alternatives serve
Evening Meal		
Pasta with beef mince and red kidney beans, tomato and green salad	1 cup of cooked pasta 65g cooked mince ½ cup kidney beans 1½ medium tomato ½ onion 2 cups green leafy salad	2 grain serves 1 meat and/or alternative serve ½ vegetable serve 1½ vegetable serve ½ vegetable serve 2 vegetable serves
Evening Snack		
Plums and reduced fat yoghurt	1 cup stewed plums 100g yoghurt	1 fruit serve ½ milk and/or alternatives serve

Grain serves = 6

Meat and/or alternatives serves = 2 ½

Milk and/or alternatives serves = 2 ½

Vegetable serves = 5 ½

Fruit serves = 2

Meal/Food	Portion Size	Food group and number of serves
Breakfast		
Wholemeal toast with baked beans and grilled tomato **Glass of milk**	2 slices of wholemeal bread 1 cup of baked beans 1 medium tomato 1 cup (250ml) reduced fat milk	2 grain serves 1 vegetable serve 1 vegetable serve 1 milk and/or alternatives serve
Morning Break		
Banana **Coffee with milk**	1 medium 200ml small/medium size	1 fruit serve ¼ milk and/or alternatives serve
Lunch		
Roast beef, salad and cheese sandwich	2 slices of wholemeal bread 65g roast beef 20g/1slice reduced fat cheese 1 cup mixed salad	2 grain serves 1 serve meat and/or alternatives serve ½ milk and/or alternatives serve 1 vegetable serve
Afternoon Break		
Coffee with milk **Unsalted mixed nuts**	200ml small/medium size 30g – small handful	¼ milk and/or alternatives serve 1 meat &/or alternatives serve
Evening Meal		
Grilled fish on rice and vegetables	100g fillet of fish 1 cup cooked rice ½ cup cooked zucchini ½ cup cooked broccoli	1 serve meat and/or alternatives serve 2 grain serves 1 vegetable serve 1 vegetable serve
Evening Snack		
Fruit salad (tinned or fresh) and reduced fat yoghurt	1 cup mixed fruit small tub/100g yoghurt	1 fruit serve ½ milk and/or alternatives serve

Grain serves = 6

Meat and/or alternatives serves = 3

Milk and/or alternatives serves = 2.5

Vegetable serves = 5

Fruit serves = 2

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