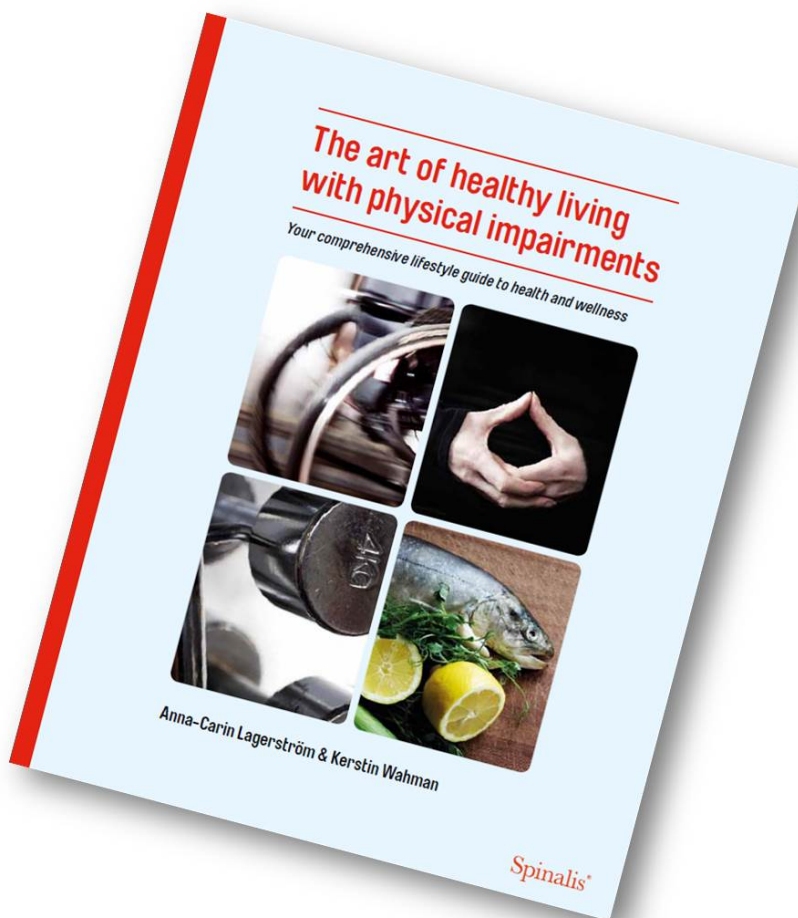

Extract from

The art of healthy living with physical impairments

by Anna-Carin Lagerström & Kerstin Wahman





Food and Weight

Nutritious foods supply us with the strength and energy necessary to cope with our daily lives. They strengthen our immune defenses and help us stay healthy. This is true for all of us. The recommendations for people with physical impairments such as Spinal Cord Injury (SCI) are essentially the same as the recommendations for the general population, but they are just so much more important. Many persons with physical impairments experience secondary health complications. On top of psychological stress there might be problems such as pain, fatigue, bladder infections, chronic constipation, pressure sores, osteoporosis, obesity, and cardiovascular disease – all health situations that place additional demands on the provision of good nutrition. The recommendations primarily involve adapting eating habits to a more sedentary lifestyle and lower metabolic rate using nutrient-dense foods to nourish your body according to the concept ‘less but better’.

In this chapter you will learn how to eat well, feel satisfied, and maintain or reduce your weight regardless of physical impairments.

It will help you:

- understand what happens to your metabolism after SCI or other physical impairments.
- learn what a good, healthy weight is and how to calculate and evaluate your Body Mass Index (BMI).
- discover the meaning of healthy eating and what to eat to maintain or decrease your weight if your energy consumption is low.
- learn about nutrition in relation to some common secondary health complications.
- put into practice different principles and tools for healthy eating/‘less but better’ : portion control based on the Plate Method for Persons with Low

Energy Expenditure, a method we simply call ‘Amount of Food and Estimation of Calories’, a Swedish diet known as Iso, and the use of a Food Diary. You will also find a short presentation of the American DASH diet.

Try this:

- Embrace the idea of being valuable and that your nutritional needs are specific. Simply put – be a bit more egoistic!
- Repeat to yourself, and learn by heart, some simple phrases explaining why ‘less but better’ applies to you and tell your friends, family, and any caregivers.
- Keep the principles and tools from ‘less but better’ in mind when you do your meal planning, when you go grocery shopping, or when eating out.
- Practice the principles when you do your own cooking: adapt your favorite recipes to your specific needs when creating dishes from the different food groups, carefully choose the amounts of the various foods, and of course be aware of portion sizes.
- Formulate realistic goals that you can reach.
- Conquer emotional eating.
- Seek advice and tips from peers and mentors.

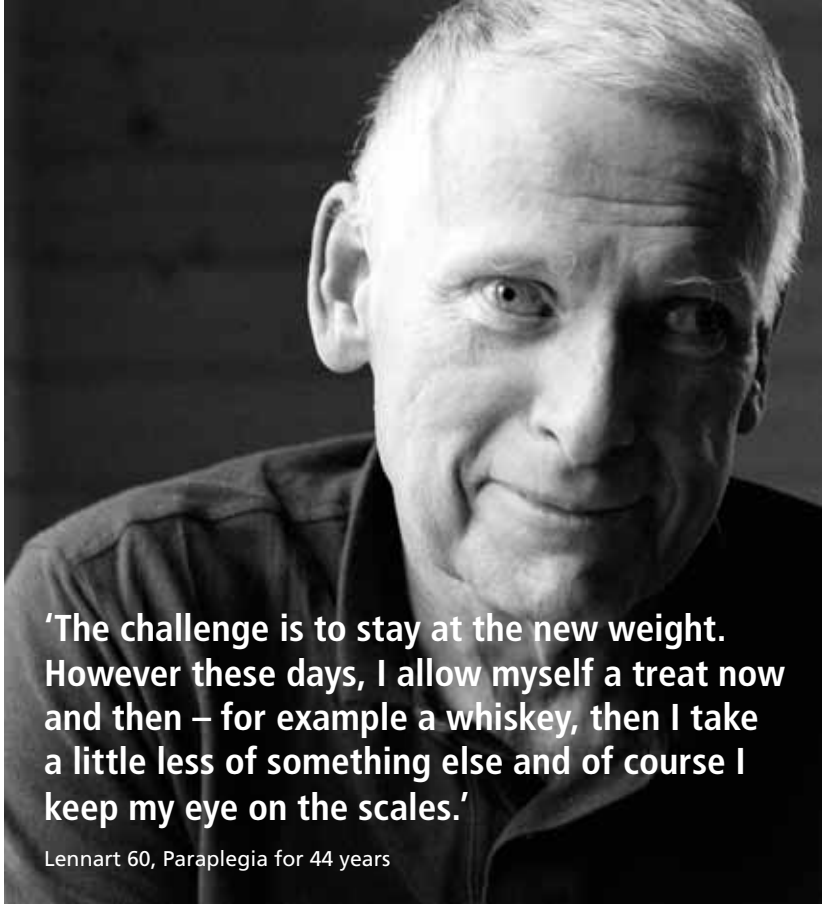
We specifically address those who have been living with physical impairments for some time but are otherwise healthy. NB: If you are underweight or malnourished, or if you have an illness that requires a special diet, you should contact a dietitian/ your doctor/ a nurse who is knowledgeable about nutrition to find out what dietary recommendations apply to you before you implement any major changes.

Lost 86 pounds (39 kg)!

Lennart Grånemo succeeded in doing what many believe is impossible. With self-reflection, insight, a firm decision to take responsibility, the acquisition of knowledge, and the support of inspiring role models along the way, he succeeded in losing 86 pounds (39 kg) in just a few years.

‘I gradually realized that you cannot get rid of the extra pounds with just exercise. It requires a more comprehensive lifestyle change. I used to be a give-me-extra-of-everything kind of a guy – extra fries and extra Béarnaise sauce. I even used to have Béarnaise sauce on macaroni!

‘I feel stronger and happier. I have never had as much energy as I have now!’



'The challenge is to stay at the new weight. However these days, I allow myself a treat now and then – for example a whiskey, then I take a little less of something else and of course I keep my eye on the scales.'

Lennart 60, Paraplegia for 44 years

Lennart at Tenerife in the late 1980s.



The most important factors were probably that I took the decision to become responsible – for example, by gathering information on how many calories there are in various things and starting a food diary. Support from people around me was also very important.

When I modified my diet, the pounds just started falling away. After one month, I had lost nine pounds (4 kg). After that it went a little slower.

I got really motivated when I was able to buy new pants and shirts and fitted into some of my old favorites that had been hanging in the closet for years. It also felt fantastic that my transfers got so much easier. Now I can get into cars, taxis, and airplanes without problems. I remember how difficult it used to be. Another bonus is my new wheelchair – it's smaller and lighter. When you add it all up, life is just so much easier.

I feel stronger and happier. I have never had as much energy as I have now. Plus, my doctor says I don't need medication for high blood pressure anymore. My blood pressure is perfect!

Lennart got serious about his weight a few years ago. He has successfully maintained his new weight of approximately 134 pounds (61kg) and no longer needs to be quite as strict with himself.

LENNART'S RECIPE:

'This is what worked for me!'

- Count calories. (I tried to keep myself between 900–1,300 calories per day.)
- Keep a food diary.
- Take small portions.
- Eliminate most things that contain sugar.
- Drink water with your meals.
- Eat regular meals.
- Weigh yourself at least once per month.
- Try to find fun things to do instead of sitting at home feeling sorry for yourself and snacking on candy and chips/crisps while watching TV.

A reduced metabolic rate means fewer calories burned

Following SCI or other physical impairments, the metabolism slows drastically, specifically if there is significant loss of muscle mass. Research and our clinical experience have shown that persons with SCI may need to reduce the energy content in their food by 25–50 % from previous levels to avoid unwanted weight gain.

The rate at which calories are burned by the body governs the need for energy or fuel. Think of it in terms of an 'engine'. Factors which determine the size of the engine and its energy requirements:

- *age* – children and younger persons have higher energy requirements/faster metabolic rate than those who are older.
- *gender* – in general, men have higher energy requirements than women because of their greater lean muscle mass.
- *body composition* – a person with large muscle mass requires more fuel and has a faster metabolic rate than the same person with less muscle mass.
- *level of activity* – increased physical activity requires more energy than being sedentary.
- *a genetic component* that influences the metabolic rate.

Three factors that affect an individual's metabolism

The amount of fat-free body mass. This is the factor which governs the basal metabolic rate to the greatest extent (70–75%). Basal metabolic rate means the amount of energy required to sustain life, to ensure the proper function of all cells in all organs, and to maintain your heart beat. It is in the fat-free or lean body mass that metabolism takes place. A large body with a high proportion of lean muscle mass has a higher basal metabolic rate (a larger 'engine') than a small body or a body with less lean muscle mass.

Physical activity. To some extent, it is possible to influence and raise the metabolic rate by increased physical activity.

Thermal Effect of Food (TEF). Approximately 10% of energy use is through TEF. This is the energy required to digest food and produce heat in the body. This effect can only be influenced marginally.

Energy requirements relative to gender, age, and physical activity level – general population

Physical activity level	Age	Estimated calories required per day
High level of activity:		
Men	18–30	3,200 calories
	31–60	3,000 calories
	61–70	2,600 calories
Women	18–30	2,500 calories
	31–60	2,400 calories
	61–70	2,200 calories
Medium level of activity:		
Men	18–30	2,800 calories
	31–60	2,600 calories
	61–70	2,300 calories
Women	18–30	2,300 calories
	31–60	2,100 calories
	61–70	1,900 calories
Low level of activity:		
Men	18–30	2,500 calories
	31–60	2,300 calories
	61–70	2,000 calories
Women	18–30	2,000 calories
	31–60	1,800 calories
	61–70	1,700 calories
Very low level of activity/wheelchair users:		
Men	1,700 calories (detailed information is missing)	
Women	1,500 calories (detailed information is missing)	

Scientific studies regarding energy consumption after Spinal cord injury are conducted at Rehab Station Stockholm and will be published. – Wahman

The figures given should be taken as *very approximate* guidelines. There are those with a considerably faster metabolic rate but there are also those who have a significantly slower metabolic rate. For example, able bodied elite athletes can require up to 7,000 calories per day during intensive training periods, while persons with comprehensive paralysis can have an even considerably lower requirement (down to 1000 calories – or even less) than what is given under the heading *Very low level of activity*.

So how much fuel do you need?

Go through the activity levels and consider which square in the table best describes you as you were before your injury/illness and where you fit in now. Here, you will find the clues to the adjustments you need to make to your energy intake in order to maintain a healthy weight.

...while persons with comprehensive paralysis can have an even considerably lower requirement (down to 1000 calories – or even less)...

Conclusion:

Not only does the lower level of physical activity after an impairment resulting in muscular paralysis for example, affect the body's metabolism, but also the decrease in lean muscle mass.

'I have been injured for more than ten years and always actively exercised, both in the gym and outside rolling my chair, trying in this way to lose my extra pounds. I believed that if I just kept exercising I would be able to continue eating the same way I always did. Now I have started to realize that it is not through exercise that I will lose weight. Upper body training with strength and aerobic fitness segments simply does not burn the calories that I thought it would. I realized that I would also have to reduce my intake of calories.'

Statement from one of the participants in the Weight Group at Rehab Station Stockholm/ The Spinalis Clinic (a rehab center in Stockholm).

Concrete energy adaptation



A light blue rectangular box containing a handwritten list of McDonald's items. At the top right is a hand-drawn golden arches logo. The list includes: '• BIG MAC', '• COLA MEDIUM SIZE', and '• FRENCH FRIES MEDIUM SIZE'. A horizontal line is drawn under the last item, and below it, the text 'Approximately 1.250 calories' is written.

Prior to an injury/illness, this can sometimes work (if one is an 18-year-old male and/or athlete).



A light green rectangular box containing a handwritten list of McDonald's items. At the top right is a hand-drawn golden arches logo. The list includes: '• BIG MAC', '• MINERAL WATER', and '• BABY CARROTS'. A horizontal line is drawn under the last item, and below it, the text 'Approximately 590 calories' is written.

Post injury/illness, it's not only the adjustment of calorie intake that is important but also being able to distinguish between daily food habits and special occasions, i.e. foods you rarely eat or 'treats'.

Information from www.mcdonalds.com

Weight and weight gain

Worldwide, excess weight and obesity issues have more than doubled since 1980. There are many and complex explanations for this development. But to put it simply – we consume more calories. Portion sizes have grown and much of what we eat and drink is far too energy dense. Soda, ice cream, candy, cookies, chips, which were earlier perceived as an occasional treat and only brought out on special occasions have become cheap, easily accessible, every day dietary items. The food industry all around the world supplies consumers with cheap, highly processed foods (often high-fat, high-calorie, and made with refined white flour instead of whole grain). We have also become more sedentary. This development, with the major negative impact it has on health, hits individuals with restricted mobility even harder.

SCI and weight

From the four corners of the world, we hear reports about weight gain and obesity in persons with SCI. For example, a study in the Stockholm area showed that approximately 75 percent of participants in the study were overweight or obese. The purpose of the study was to examine risk factors for cardiovascular disease in paraplegia. Similar weight issues have been reported from groups with other disabilities.

Besides the change in lifestyle and consumption patterns in society as a whole, an important factor associated with weight gain following SCI, is the slowdown in metabolism. Other factors may be of a psycho-social nature – for example, the changes in daily life occurring with the loss of structure provided by employment, the loss of a daily schedule, and thus the loss of obligation to get up early in the mornings. Other reasons may include depression, lack of motivation, and side effects from various pharmaceutical drugs.

Weight gain as a side effect of certain drugs or groups of drugs

Two examples of groups of drugs that can lead to weight gain are antidepressants or the SSRI preparations and certain morphine preparations used to treat long-term pain caused by for example, nerve damage. Both these groups of drugs increase appetite which contributes to weight gain. Another medication which can also contribute to weight gain is Baclofen, an anti-spasticity drug. A reduction in muscle activity means a reduction in energy use. If the energy intake is not similarly reduced, weight increases.

Facts

Undesirable low weight/underweight and malnutrition

For people living with SCI or other physical impairments, losing too much weight is uncommon, but does happen. Underlying causes can be illness, medication, addiction, depression, and/or eating disorders. The term 'underweight' describes a weight considered too low to be healthy; a situation which may be indicative of malnutrition and for example, will increase the risk for pressure areas. Because weight loss associated with nutritional deficiencies is a problem area which already receives attention from the health care system, we will not deal with it further in this book.

NB: Low body weight is not synonymous with malnutrition. Read more about healthy food, BMI, and weight classes for persons with SCI in the pages that follow.

Some tips though, if you want to gain weight:

When increasing calories, avoid foods with high sugar content (sugar feeds bacteria) and processed foods. Consume whole grain breads and whole grain pasta and foods with healthy fats such as avocados, nuts, olives, olive oil, flax seed oil, and salmon.

Try this:

If you have experienced sudden, unwanted weight gain and suspect that it may be a side effect of your medication, speak with your doctor. Ask if there are alternative medications without the undesirable side effects. Before you book this appointment, we suggest that you keep a food diary for one week in order to identify other possible reasons such as changes in your diet. You will find suggestions on how to keep a food diary later in this chapter. Compare your notes with the check lists in Amount of Food and Estimation of Calories in the Toolbox.

A common weight trend after spinal cord injury (SCI)



'I injured my neck in a diving accident and became totally paralyzed in my legs, torso, and to some extent even my arms. Before the accident, I had a normal weight for a 23-year-old male. I weighed 157 pounds (71 kg) and was completely happy with my weight relative to my height of 5 ft 8 in (177 cm). I had never really even thought about how much I weighed. Initially after the accident, I lost 22 pounds (10 kg). But I gained those pounds back relatively quickly during the first years after the accident. Ten years later, I had gained another 22 pounds (10 kg). Suddenly everything started to feel tougher. I weighed 179 pounds (81 kg) which was not all that visible, but I felt heavier and transfers were becoming difficult.

I didn't really notice the extra pounds, so the weight-gain problem just kind of snuck up on me. I had not weighed myself during those ten years, so I didn't really have any idea what had happened.

Now, I've lost 18 pounds (6 kg) through healthier eating without starving or suffering and by being a little more active. I feel stronger and lighter than I have in a long time and I am more aware of my weight.'

Peter 36, Tetraplegia for 13 years

The newly injured phase

Almost everyone with SCI loses weight in the acute phase immediately following the accident. Between 11–33 pounds (5–15 kg) is usual. This weight loss is the result of a decrease in the amount of muscle mass, fat, and water in the body. Just as with starvation, the body prioritizes using energy reserves in the muscles and stored fat to ensure survival of the vital organs. During

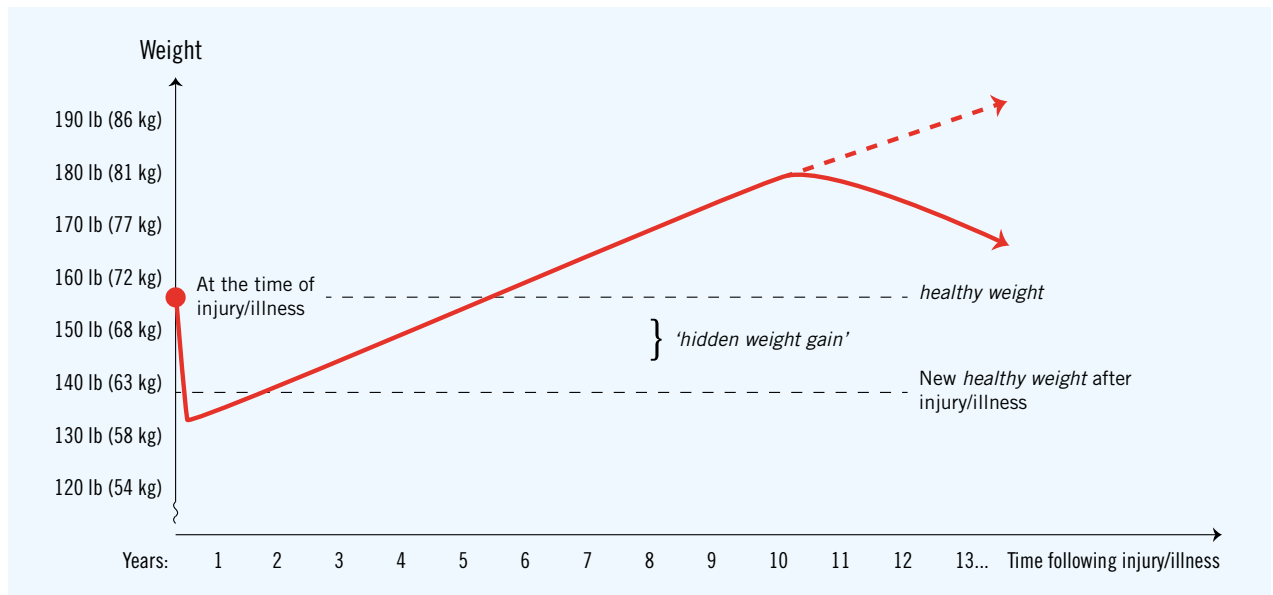
this stage, the entire health care system focuses on the patient recovering as quickly as possible. To this end, energy and nutritional supplements are given to reverse the weight-loss trend. The patient is weighed regularly and encouraged to eat energy-rich food.

The next phase

After the newly injured phase, there is a period of intensive rehabilitation where the person gradually improves after which he/she is able to go home. Weight often continues to increase. Because he/she is now considered medically stable, there is not necessarily a routine weight follow-up by the health care providers. Unnecessary weight gain can happen quickly and easily if information and encouragement are not given on how to adapt and decrease the calorie intake. In fact, many people will have already gained undesirable pounds by the time he/she returns to pre-injury weight. To weigh as much after the SCI as before, is a sign that former muscle mass pounds have been replaced by fatty tissues. We refer to this as 'hidden weight gain' because it is not always apparent on the scales or even to the eye.

Experience shows that if Peter had not reacted to gain control, his weight increase would have naturally continued. For example, on this same diet he would have gained at least another 22 lb (10 kg) every 10 years and so on...

Common weight trends after SCI, illustrated here using Peter's curve



The Weight Log is designed especially for wheelchair users who have access to wheelchair scales. The Weight Log and the concept of procuring a wheelchair scale for free patient access has been spread to many rehab centers in Sweden. It is an easy way of helping the wheelchair dependent person to 'keep an eye on weight fluctuations'.

Spinalis
Health Navigator®

Weight log

Weigh yourself regularly and use the Weight log to keep an eye on your weight trend (if you are able to use a regular bathroom scale, then by all means do so).

Weighing yourself with a wheelchair scale

- Weigh yourself while sitting in your wheelchair wearing your usual clothing and shoes – note the total weight.
- Find out how much your wheelchair plus seat cushion weigh = wheelchair weight.
- Subtract the weight of your clothing. As an example, subtract 4.4 lb (2 kg) for a larger person wearing jeans and a slightly heavier type of shoe or 2.2 lb–3.3 lb (1–1.5 kg) for a smaller person or if wearing light, summer clothing.
- Total weight minus the weight of your wheelchair and clothing = your body weight.

Measuring with a measuring tape

- Another way to keep an eye on your weight is to measure your waist – your waist circumference. This is where we usually store excess fat. Furthermore, research indicates that abdominal fat has a more negative impact on health than excess weight that is distributed throughout your entire body.
- Measure the circumference around your abdomen with a measuring tape at approximately the level of your belly button immediately after a normal exhalation.
- If possible, take the measurement while you are standing. Otherwise, measure while lying down. It is important that you do it the same way every time.
- According to the WHO, a man's waist circumference should be 37 in (94 cm) or somewhat less and preferably not exceed 40 in (102 cm). A woman's waist circumference should be 31.5 in (80 cm) or somewhat less and preferably not exceed 35 in (88 cm). Assessment of waist circumference is independent of height.

Wheelchair weight: _____ lb (kg) + Clothing: _____ lb (kg) = _____ lb (kg)

Date	Total weight	Body weight	Waist circumference

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Spinalis®

'There is nothing more rewarding than when you start to notice that what you are doing is getting results. I like numbers and measureable results and that's why it's good for me to keep a diary. I use the Weight Log as a motivational tool.'

Örjan 67, Paraplegia for 5 years

Try this:

- Keep an eye on your weight; weigh yourself regularly. This applies for the rest of your life.
- Write down how much you weigh and draw a weight curve or keep a weight log. In this way you remain alert to fluctuations, mindful of which way things are moving, and more able to intercept undesirable trends.
- Be especially observant if your weight starts getting close to your pre-injury weight. That means it is high time to stop the trend!
- Estimate your new energy requirements and try to adapt your calorie intake.
- Use the adapted Plate Method and the checklists for Amount of Food and Estimation of Calories.

‘Weight is definitely important! And that’s probably why wheelchair manufacturers put so much effort into designing wheelchairs in light materials. Lightweight wheelchairs are popular because they are easy to lift, maneuver, and get around in.’

Statement from a participant at a health lecture.

Why watch your weight? Here’s why!

There are many reasons why you should watch your weight. Excess weight and obesity negatively affect your health and well-being and in addition, they might reinforce the consequences of your injury/illness.

There is much to be gained from losing weight if you have a SCI or other physical impairments and are getting hefty!

- » *All transfers become simpler* and it is easier to manage an active life. Your need for assistance may decrease, which results in an increase in personal freedom and independence. This means that the extent of your mobility disability diminishes.
- » *The tendency to get pressure sores and skin complications* is reduced.
- » *Shoulders and arms* are exposed to less wear and tear during transfers. This is true for wheelchair users and those who walk with crutches (for those who walk, there is less strain on weight bearing joints, i.e. ankles, knees, and hips). Essentially, extra stress on nerves, joints, and muscles with the risk for inflammation and accompanying pain is decreased.
- » *Reduction in urinary incontinence*. Urine leakage worsens in individuals who are overweight or obese. A reduction in body fat reduces the pressure in the abdominal cavity and it is easier to hold back. A ‘functional weight’ also makes bowel and bladder routines easier.

How to find your BMI

– Metric measures

If you want to know your precise BMI and like doing a little math, use this formula:

$BMI = \text{weight (in kilograms)} / \text{height (meters)} \times \text{height (meters)}$. For example, a person whose height is 1.70m and who weighs 70kg will have a BMI of 24.2.

'Normal range/healthy weight' according to BMI 18.5–24.9 is as follows:

(Note that these weight categorizations apply to the general population, by which we here mean people without significant loss of muscle mass.)

Metric measures

Height	Weight
Meters (m)	Kilograms (kg)
1.52 m	43 kg – 58 kg
1.54 m	44 kg – 59 kg
1.56 m	45 kg – 60 kg
1.58 m	46 kg – 62 kg
1.60 m	48 kg – 64 kg
1.62 m	49 kg – 65 kg
1.64 m	50 kg – 67 kg
1.66 m	52 kg – 69 kg
1.68 m	53 kg – 71 kg
1.70 m	54 kg – 72 kg
1.72 m	55 kg – 74 kg
1.74 m	56 kg – 77 kg
1.78 m	59 kg – 78 kg
1.80 m	60 kg – 81 kg
1.82 m	61 kg – 82 kg
1.84 m	63 kg – 84 kg
1.86 m	64 kg – 86 kg
1.88 m	65 kg – 88 kg
1.90 m	67 kg – 90 kg
1.92 m	68 kg – 92 kg
1.94 m	70 kg – 94 kg
1.96 m	72 kg – 96 kg

- » *Sleep improvement.* You feel more energetic. Overweight people sleep poorly and are more likely to snore. Additionally, this may contribute to involuntary gaps in respiration known as obstructive sleep apnea. This results in poor oxygen uptake and excessive daytime fatigue.
- » *The overall quality of breathing improves when abdominal fat is reduced.* A big 'beer belly' creates upward pressure and prevents the diaphragm from contracting so that the lungs can expand. The diaphragm is the primary breathing muscle used when you 'breathe with your belly' concentrating on the lower portion of the lungs. This problem is particularly relevant for those with higher level tetraplegia where respiratory function is already compromised.
- » *Decreased cardiovascular disease risk and other health risks.* Excessive weight gain or obesity, specifically when either are the result of unhealthy food consumption, increase the risk for certain lifestyle diseases. Abdominal obesity, resulting in an increase in waist size is considered especially dangerous. The risk of developing high blood pressure, fatty liver, insulin resistance, Type 2 diabetes, abnormally high levels of lipids in the blood, blood clotting, and cardiovascular disease correlates directly with increased abdominal girth. The fats from the abdomen's cells enter the bloodstream and negatively influence blood vessels, the liver, the release of insulin, and blood pressure. A number of other disease conditions correlate to excessive weight and obesity, including a number of cancers.
- » *Lower risk of injury for those who assist you.* Obviously, those who assist you physically are more likely to develop problems with their backs and shoulders if you are overweight.

What is a good weight?

When we say good weight, we mean not just a weight that is healthy but also a weight that is functional. In other words, a weight that is manageable for you and which does not unnecessarily hinder transfers or an 'active life'.

'When I think about it, I managed myself much better ten years ago. I was 33 pounds (15 kg) lighter. For example, I had no problems taking care of my personal hygiene on my own.'

Spontaneous comment from a person in a wheelchair with a spinal cord injury attending a health lecture.

The general rule is that you ought to weigh less after your injury or illness than before. This is primarily due to the decrease in muscle mass but also a decrease in skeletal density. The parts of the skeleton which are not regularly subjected to body weight loading will decalcify.

Accordingly, if you have a spinal cord injury (SCI), optimum weight depends on the anatomical level of injury, the level of completion of injury, and pre-SCI body morphology (if you are a big or small person).

Body Mass Index – a way to evaluate weight from a health perspective

Body Mass Index (BMI) is used all over the world to evaluate weight relative to height from a broad health perspective. Its purpose is to provide a simple way to get an idea about whether an individual's body composition consists of an unhealthy proportion of fat, i.e. if the person's weight is healthy, too low, or too high. Since too little or too much body fat poses health risks, a simple evaluation tool is needed. Research shows that if a person's weight is acceptable according to the guidelines expressed for BMI, then the risk of weight-related health problems is low.

Weight classes

The World Health Organization (WHO) has set out four different weight classes for BMI in adults:

Underweight	BMI under 18.5
Normal range/healthy weight	BMI 18.5–24.9
Overweight	BMI 25–29.9
Obese	BMI 30.0 and over with three classes of obesity (I, II, and III)

BMI is a rough measurement and can be misleading

BMI is an assessment instrument which is most appropriate to study health-related issues in whole populations of people, but it is often used within healthcare. It is easy to use but also vague, which can be misleading. Body weight alone tells us nothing about body composition or percentage of fat relative to muscle. According to the WHO (World Health Organization), division into weight classes is accurate for 8 out of 10 persons in a general population. Our concern is that assessment using BMI is misleading for two specific groups of people: those with an unusually large amount of muscle

How to find your BMI

– Standard measures

If you want to know your precise BMI and like doing a little math, use this formula:
 $BMI = \text{weight (in pounds)} \times 703 / \text{height (inches)}^2$
 For example, a person who is 67 inches tall and who weighs 154 pounds will have a BMI of 24.1.

'Normal range/healthy weight' according to BMI 18.5–24.9 is as follows:

(Note that these weight categorizations apply to the general population, by which we here mean people without significant loss of muscle mass.)

Standard measures

Height	Weight
Feet (ft) Inches (in)	Pounds (lb)
5 (ft)	95–127 (lb)
5 (ft) 1 (in)	98–132 (lb)
5 (ft) 2 (in)	101–136 (lb)
5 (ft) 3 (in)	105–140 (lb)
5 (ft) 4 (in)	108–144 (lb)
5 (ft) 5 (in)	111–149 (lb)
5 (ft) 6 (in)	115–154 (lb)
5 (ft) 7 (in)	118–159 (lb)
5 (ft) 8 (in)	122–163 (lb)
5 (ft) 9 (in)	125–168 (lb)
5 (ft) 10 (in)	129–173 (lb)
5 (ft) 11 (in)	133–178 (lb)
6 (ft)	137–183 (lb)
6 (ft) 1 (in)	140–188 (lb)
6 (ft) 2 (in)	144–193 (lb)
6 (ft) 3 (in)	148–199 (lb)
6 (ft) 4 (in)	152–204 (lb)

Facts

The following values are usually given as guidelines for people with SCI:

- In cases of paraplegia: approximately 10–15 lb (4.5–7 kg) weight loss or approximately 7.5% of your pre-SCI 'healthy weight'.
- In cases of tetraplegia: approximately 15–20 lb (7–9 kg) weight loss or approximately 12.5% of your pre-SCI 'healthy weight'.
- In cases of partial paralysis where one can walk, there will not be such extensive weight loss because the mass of the body's largest muscles is maintained to some extent. The largest muscles are those of the thighs and buttocks.

mass (for example, body builders) and those with an unusually low amount of muscle mass.

Obviously, this applies to persons who have experienced loss of muscle mass due to SCI or other physical impairments. On one hand, people can be assessed as being underweight incorrectly (as having a percentage of fatty tissue which is too low) although their weight is actually fine. On the other hand, (and this is more common) you could be incorrectly assessed to be within 'Normal range/healthy weight' when you actually have a larger percentage of fatty tissue than what is considered healthy.

Adapted weight classes

In order to make assessments less misleading, a new tool has been developed with adapted weight classes. These new weight classes – Table II and III – take into account the estimated percentage of loss of muscle mass and bone mineral density in persons with spinal cord injuries.

Table I Weight classes according to the WHO (general population)

Persons with full muscle mass	
Underweight	< 18.5
Normal range/healthy weight	18.5–24.9
Overweight	25.0–29.9
Obese class I	30.0–34.9
Obese class II	35.0–39.9
Obese class III	≥ 40.0–

Tables II and III, with adapted weight classes for persons with comprehensive loss of muscle mass have been developed on the basis of others' research and own clinical experience. They should be interpreted very roughly. A-C Lagerström, Spinalis Foundation 2004

Table II

Persons with paraplegia (less 7.5% muscle mass)	
Underweight	< 17.1
Normal range/healthy weight	17.1–23.0
Overweight	23.1–27.7
Obese class I	27.8–32.3
Obese class II	32.4–36.9
Obese class III	≥ 37.0–

Table III

Persons with tetraplegia (less 12.5% muscle mass)

Underweight	< 16.2
Normal range/healthy weight	16.2–21.8
Overweight	21.9–26.2
Obese class I	26.3–30.5
Obese class II	30.6–34.9
Obese class III	≥ 35.0–

Take Peter for example (a previous contributor in this chapter), before his injury he weighed 157 pounds (71 kg) and had a BMI of 22.5 which is a 'normal range/healthy weight' according to the WHO definition. Ten years after his SCI, Peter weighed 179 pounds (81 kg) with a BMI of 26. As Table III shows with tetraplegia, Peter was more overweight with a BMI of 26 than he would have been in the absence of the associated muscle loss. Accordingly, a new optimum weight for Peter would be approximately 137–141 pounds (62–64 kg).

Try this:

Calculate your BMI and use the tables above to evaluate your weight in terms of the ranges provided. Be aware that the weight limits for each class should be taken as approximate. There are many factors at play when you consider your own weight. The most important thing is to feel comfortable.

NB: It is useful to calculate what your BMI was before your SCI. If you were previously overweight, it is even more important to find strategies to avoid weight gain given your new circumstances.

How to weigh yourself

Opportunities to weigh yourself are not always straightforward. Here are some suggestions when stepping onto regular bathroom scales is not possible:

- Chair scales may be available at your local health clinic.
- A scale attached to a hoist – for example, an industrial hanging scale that can be attached to a ceiling hoist or mobile hoist equipment.



A hanging scale attached between ceiling hoist and lifting strap/harness.

- An industrial scale with a platform works well if you want to weigh yourself in your wheelchair. Freight companies, laundries, or warehouses may have them. Vehicle inspection companies may have scales for weighing motorcycles. Veterinary clinics involved with large animal care may have suitable scales.
- A standard scales set can also be rebuilt to accommodate a wheelchair. Mount a firm platform onto the scales, perhaps a piece of plywood or aluminum.
- (NB: Check out one such solution at www.spinalistips.se under the heading *Take care of your health.*)
- A wheelchair scale – specifically designed to weigh a person in a wheelchair. Larger general hospitals (especially those with a dialysis unit), rehabilitation centers, or even some health care centers may have one. If not, try to convince them that they should!

Keep an eye on your weight by measuring your waist

An alternative and maybe simpler way to keep an eye on your weight other than using a scale is to measure your waist circumference. When your trousers are starting to get tight around the waist and difficult to do up, it's a good idea to do a measurement!

Facts

Abdominal fat and the risk for cardiovascular disease

Research shows that excess fat deposited around the abdomen poses a greater health threat than fat distributed over the whole body. In particular, the risk increases in combination with other risk factors such as a sedentary lifestyle, high blood pressure, smoking, and unhealthy eating habits. Sleep deprivation and the effect of stress hormones during prolonged periods of stress have been linked to the development of abdominal fat. Additionally, reduced estrogen (oestrogen) contributes specifically to abdominal fat storage which is one of the reasons why it is easier for women to maintain a flat tummy before menopause. Take a look at the values listed on following page that apply to the general population but are considered applicable for persons with SCI or other physical impairments.

Waist measurement and risk for cardiovascular disease and diabetes

	Waist measurement	Risk
Men	Waist measurement of 37 in (94 cm) or less	Healthy
	Waist measurement over 37 in (94 cm)	Increased risk if other risk factors are present
	Waist measurement over 40 in (102 cm)	Significant increased risk
Women	Waist measurement of 31.5 in (80 cm) or less	Healthy
	Waist measurement over 31.5 in (80 cm)	Increased risk if other risk factors are present
	Waist measurement over 35 in (88 cm)	Significant increased risk

Try this:

Measure your waist with a measuring tape where you are narrowest and shortly after a normal exhalation. If you have a roundish belly, measure in the middle between the lower edge of your ribcage and your pelvic bone (iliac crest), at the approximate level of your navel. The reference values refer to measurements taken while standing. If possible, measure your waist while standing; otherwise you can measure while lying down. For accuracy, it is important that you always measure yourself the same way.

If your paralysis affects your abdominal muscles, the consequence is that the tummy tends to 'fall forward' when you sit. Essentially, this is the intestinal package which is no longer held in place by the abdominal muscles. This is not the same as abdominal fat. Check by measuring your waist while lying down.

If it bothers you that your tummy falls forward, try a soft corset to hold it in. This will also enable deeper breathing and help with postural support when sitting.



Healthy food and healthy eating habits when eating 'less but better'

Healthy eating is not just a question of *what* you eat, but also a question of *how much* and *how often*. We stated earlier in this chapter, that most persons with mobility disabilities are low energy consumers and need to reduce daily calorie intake to maintain a stable weight. Bluntly, this means that you ought to eat less than if you did not have a mobility disability. The margin for 'empty' calories is smaller, by which we mean ice cream, candy, cakes/muffins, soda, and chips/crisps. For optimal function and performance, it becomes more important to choose food that really contributes with all the important vitamins, minerals, antioxidants, and fiber. The requirements for improved 'food quality' increase and a 'less but better' rule applies from now on. By 'less' we mean less energy or fewer calories. Eating 'less but better' is not always obvious. In this section, we go through what constitutes healthy food choices and how diet can be adapted to suit persons with lower energy levels.

Some recommended diets

Dietary recommendations currently accepted within the scientific community, at least in Europe, are more or less identical to what has become known as the *Mediterranean diet*. A modern nutritional recommendation inspired by the traditional dietary patterns of Italy (particularly the south), Greece, and Spain. This is a diet rich in vegetables, fruit, nuts, fish, and fiber-rich grain products and legumes. It is characterized by low quantities of red meat (beef, pork, and lamb/mutton), refined sugary treats, baked goods, sweetened drinks, and industrially processed foods such as refined flour and ready-made meal items. The recommended source of fat is olive oil. Water is the main beverage at meals, but wine in moderation is an attractive characteristic!

Another dietary pattern known as the *Nordic diet* is considered a healthy option and is similar to the Mediterranean diet. Differences include rapeseed oil rather than olive oil and local fruit, with exotic fruits such as watermelon and figs being replaced by apples and pears. In Canada, Australia, and New Zealand, grape seed oil is a healthy and inexpensive oil alternative and there will be a greater variety of both local and exotic fruit.

The American *DASH diet* (Dietary Approaches to Stop Hypertension), an additional recommended healthy diet, was originally developed to lower blood pressure but has also been found to be good for weight loss. The DASH diet has many similarities to the *Mediterranean diet* as well as the

Facts

Dietary recommendations

NB: Where it says 'eat more of' in the recommendations means 'relative to everything else you eat'. It is still important not to exceed your individual energy budget.

Eat more food containing mono- and polyunsaturated fats

Foods containing monounsaturated fats:

- olives, olive oil, and grape seed oil
- eggs
- avocados
- almonds, peanuts, hazelnuts, and cashews

Foods containing polyunsaturated fats (especially Omega-3 and Omega-6):

Omega-3

- flax seed, grape seed, and rapeseed oils
- fatty fish e.g. salmon, herrings, sardines
- walnuts

Omega-6

- sesame seeds and sesame seed oil
- sunflower seeds and sunflower seed oil
- corn oil
- soybean oil
- walnuts, hazelnuts, and almonds

Eat less food containing saturated fats

- whole milk
- fatty cheeses
- cream and ice cream
- fatty meat products
- chocolate

Eat more food containing good sources of carbohydrates

- Legumes/lentils
- brown rice
- whole grain breads
- whole grain dinkel (spelt), wheat, quinoa
- vegetables, including root vegetables
- fruit

Eat less food containing bad sources of carbohydrates

- white sugar
- white bread
- soda and other sweetened drinks
- cakes/muffins
- candy
- white rice and white pasta



In brief:

Eat!

- » Vegetables (e.g. carrots and broccoli)
- » Protein-rich food (e.g. fish, eggs, chicken)
- » Fruit (e.g. apples, oranges)
- » Legumes (e.g. lentils, beans, and peas)
- » Nuts (a variety of unsalted from the health food section of your food store)
- » Good fats (e.g. olive oil, flax seed oil, coconut butter/oil, avocado, salmon and herrings)
- » Whole grain products (e.g. brown rice and whole grain breads)
- » Do not drink/eat, or avoid, everything 'white' – meaning sugar which includes sugary drinks and soda and white flour which includes bread and baked goods as well as restricting foods containing saturated fats!



Nordic diet as it is rich in fruit, vegetables, and whole grain products and limited in red meat, animal fats, and sugar.

The unhealthy alternative is often referred to as the *Western diet*. This is a diet which contains a lot of sugar and refined grain products (carbohydrates), highly processed factory-prepared and/or deep-fried food, and a low content of fruit and vegetables. Consequently, this is a diet which is associated with a variety of health problems including obesity, cardiovascular disease, and Type 2 diabetes.

Foods that protect

Amongst other ideas, a more recent point of interest is the role of inflammation in the development of some common diseases related to what we eat. Through healthy food choices we can to some extent, protect ourselves against inflammation and the problems it causes. This is where our choices

of fat and protein sources are important, as is choosing foods high in antioxidants.

- *Fat* which comes from fish (Omega-3 fats) has anti-inflammatory properties. The recommendation is to eat fish 2–3 times per week. For those who don't eat fish, the diet can be supplemented with fish oil.
- *Red meat* including beef, pork, and lamb/mutton in contrast, can increase the risk for inflammation in the body (according to supporters of the Mediterranean diet). For this reason, we recommend that you limit red meat to approximately twice per week.
- *Antioxidants* protect the body from harmful free radicals. This means that they protect against inflammation and damage at the cellular level. Antioxidants are found especially in fruit, vegetables, and berries. A good rule of thumb is the more colorful, the more antioxidants are present.

Specific recommendations

Here are some complementary recommendations which can be valuable for those with SCI and other mobility impairments. We do advise you to discuss with your doctor before initiating any major changes such as taking nutritional supplements or natural remedies on a regular basis. Then you can feel confident that there will be no problems due to overdosing or clashes with your usual medications.

Nutritional and vitamin supplements

As it seems difficult to avoid nutrient deficiencies when the caloric intake is low, you might be recommended supplements. This is especially true for someone who eats very little, who has difficulty consuming enough food, or who eats with little or no variation. These are the ones normally recommended: Calcium and Vitamin D (for bone health), Vitamin C (boosts your immune system and is good for your skin and muscles), Fish oils (contain Omega-3 which is good for your cardiovascular health and reduces inflammatory processes), Probiotics (help to maintain a healthy gut flora and regulate bowel function). For persons who do not eat meat or other animal protein, supplements of vitamin B12 are recommended. Multivitamins can be useful for overall health too as these contain the important nutrients: vitamin E, folic acid, selenium, and magnesium. NB: it is preferable that they do not contain iron or vitamin A (retinol) if you don't have deficiencies in either. They

Tip: One serving of salmon or other fatty fish, provides you with important Omega-3 fats and at the same time meets your vitamin D requirement for that day.

do more harm than good *unless of course* you have a particular need for them, and as many of you already know, iron supplements can contribute to constipation. Of course, all this in addition to our advice of wholesome food in general!

Water/ fluids

Drink 6–8 cups (1.5–2 l) of water/fluids per day (1 cup = 250 ml (approx.)/ 8 fluid oz). Water helps prevent constipation, supports kidney and bladder functions, and helps those with tetraplegia manage low blood pressure issues. Interestingly, drinking water makes it easier to maintain your weight as water reduces cravings for other more calorie-dense drinks and a good fluid balance will help you feel energetic throughout your day.

However, there is no reason to exaggerate your water intake. Moderation is best. To maintain your water balance, consider restricting drinks with a dehydrating effect such as coffee, tea, or alcohol. A sign of dehydration is urine that is dark with a strong smell.

Sweet, sour, and urinary tract infections

Preliminary research results suggest that a reduction in sugar consumption helps lower the incidence of urinary tract infections (UTIs) in persons with SCI. It appears that sugar inhibits the human immune system, which opens the door to infection. So specifically watch out for sugar, candy, soda, and juice if you have problems with UTI.

Here is a handy hint: Bacteria do not thrive in an acidic environment. Try pressing a little lemon juice into the water you drink to create a high acidic environment in your bladder. As a bonus, you will benefit from important antioxidants. Cranberries (and blueberries) are another proven means for prevention of UTI. They contain large amounts of compounds called tannins, which prevent E. coli bacteria attaching to the wall of the bladder. Besides fresh, dried, or frozen, cranberries are also available in tablet form and juice drinks. Choose real juice from a health food store as these do not contain as much added sugar.

Protein and healing of wounds

If you have pressure area problems, it is important to increase the amount of protein-rich food in your diet. Protein is needed to repair the body's cells. You may need to supplement in the form of a protein-rich nutritional drink.

Good to know:

Omega-3 has blood thinning properties. Consult with your healthcare professional if you are on blood-thinning medication before taking Omega-3 supplements.

Tip: Eggs are healthy and good choices of protein. You can have at least one per day – even with high cholesterol.

It is also important to increase calories for wound healing. When acting on that, choose healthy, energy-rich foods such as nuts, avocado, whole grain breads etcetera. If you decide to try or already use nutritional supplement drinks, make sure they are not too energy-rich as this might cause unwanted weight gain.

But beware if you have problems with your kidneys, you should be on a low protein diet. Check with your dietitian or doctor.

Is it necessary to consume extra protein to strengthen weak muscles?

If your diet includes a normal amount of protein, then it is not necessary for those who exercise normally to supplement. Research has shown that protein powder supplements do not result in increased muscle strength or endurance in a study conducted on persons with tetraplegia who had weak arm muscles.

However, those who train **very hard** may require increased protein. Interestingly, this need is most often met through responding to increased hunger feelings. Protein drinks can be a good supplement and snack for such individuals, but do refer to the warning above regarding kidney problems and protein. Another tip is to drink a glass of milk in conjunction with training. This provides you with protein and carbohydrates combining in a nice package that facilitates muscular recovery. You can find a protein drink recipe under the heading *ABCs of Weight Loss*.

Food and the digestive tract

Many wheelchair users have problems with the digestive tract. Paralysis and extended periods of sitting lead to poorer action in the intestines and problems such as constipation or diarrhea, gas, and a bloated feeling are common. There used to be clear guidelines as to what was considered 'good food' for gastrointestinal health and what was best to avoid. These days, it is believed that recommendations should be individualized, as different people have different needs. For example, the recommended daily fiber intake for able-bodied persons is high but too much fiber can cause troubles for a person with SCI. Always get specific advice and start with small modifications so that your bowels have a chance to adapt to any changes in diet.

However, diet experts do agree that certain recommendations apply to the majority.

Good to know:

Examples of foods which can cause hardening of feces/constipation:

- bananas (especially if unripe)
- pasta (well-cooked)
- rice (white)
- white bread (white flour)
- tea
- not drinking enough liquids

Examples of foods which can cause gas:

- onions, beans, lentils, cabbage
- whole grain breads and breads with a high percentage of fiber
- carbonated drinks

Tip: Cooked vegetables are considered to be less difficult for digestion than raw.

Do you have problems with constipation?

If so, you can try it like this:

- Take fiber supplements such as ground flax seeds and avoid processed foods such as white bread (contains very little fiber)
- Drink 8–10 cups of water/fluid per day
- Eat good fats (this helps lubricate your bowel and soften hardened stools)
- Eat dried fruit: prunes (also prune juice and purée) and apricots
- Eat fresh fruit: pears, plums, and kiwis
- Eat magnesium-rich foods (natural laxatives): bran, sunflower seeds, sesame seeds, and quinoa
- Orange juice and coffee are laxatives too

Food intolerance

Food intolerance has become quite common. This happens when a food irritates the stomach and the stomach cannot properly digest it. You may have symptoms such as gas, cramps, and/or bloating. It usually comes on gradually and occurs when you eat certain foods in large quantities or often.

Among the most common foods that cause intolerance are lactose (a sugar found in milk/dairy), soy, and wheat.

Try this:

Keep a food diary and write down your symptoms. Try to figure out which food is causing you trouble and what you will need to cut back on. If you have a lactose intolerance you can buy lactose-free milk or take a lactase enzyme supplement.

NB: Food allergy is not the same as food intolerance. If you have a food allergy you need to stop eating the specific food altogether. Your doctor can help you find out if you have an allergy or an intolerance.

Tip: Drink 2–3 cups of juice on an empty stomach first thing in the morning if you are constipated.

Tip: Take the following healthy fiber supplements when you know you are not eating enough fiber-rich food and you are constipated. Don't forget the water!

- » Ground flax seeds
- » Ground chia seeds
- » Whole husk psyllium

Tip: Increase the amount of fiber in your diet slowly to avoid excessive bloating.

Good to know:

Help the bacterial flora in your intestines to stay healthy – specifically important when using antibiotics.

Examples of fermented foods that are high in good bacteria:

- yogurt and kefir
- sauerkraut, miso, and pickled vegetables

'Someone tipped me to try eating a kiwifruit with my yogurt for breakfast. Not only does this up my daily dose of vitamin C and other antioxidants, which feels good, but I'm also very regular. No more constipation for me with hours sitting on the toilet waiting for something to happen! Talk about a bonus!'

Tommy 48, incomplete Tetraplegia for 4 years

What is your energy level?

If you want to eat well but have a low energy expenditure/consumption, there is simply no way to avoid considering just how many calories there are in various food products. It boils down to simple mathematics. If you eat more calories than your body uses, you will gain weight. If you eat fewer calories than what you burn, you will lose weight. If you eat as many calories as you burn, your weight will remain stable.

A sample calculation

If you eat and burn 2,000 calories a day, your weight will stay the same. If you reduce your energy intake by, for example 500 calories a day to 1,500 calories, your body will get the calories it needs by 'borrowing' it from stored body fat. If you eat 1,500 calories every day for one week (while still burning 2,000) you will lose one pound (0.45 kg) (minus 500 calories /day in 7 days = 3,500 calories = one pound (0.45 kg) of fat).

Good to know: 100 calories is the equivalent of one banana or a small serving of ice cream or ten potato chips/crisps.

If you consume 500 calories more per day in 7 days than what you burn, you will gain one pound (0.45 kg).

We are genetically programmed to store fat and the body's capacity to store fat knows no bounds; weight gain can continue throughout an entire lifetime.

For many, it is enough to abandon a *Western diet* and switch to a *Mediterranean* or *Nordic diet* in order to eat well and stop unwanted weight gain. For others, especially those with very low energy needs, more significant changes are needed. The guidelines developed for this book focus on those who fit the criteria for low or very low energy needs.

Which energy level best describes you?

For many persons with SCI or other physical impairments, 1,600 calories per day appears to be the right level for maintaining weight or keeping it stable (refer to the table under the heading *Energy requirements relative to gender, age, and activity level* at the beginning of this chapter). However, to lose weight you would need to reduce your daily intake of calories – for example to 1,400 or 1,200 calories per day.

As a comparison, 1,600 calories per day is the level recommended in many weight loss programs for the general population.

For many persons in our target group, 1,400 calories or 1,200 calories per day is reasonable for achieving weight loss.

For those with comprehensive neurological disabilities, 1,200–1,400 calories per day is reasonable for maintaining weight.

For a few individuals, 1,200–1,400 calories is too high. This may need to be reduced down to 1,000 calories per day to maintain or lose weight.

NB: However, if your energy turnover is this low and you want or need to lose weight, we strongly recommend that you seek professional help to ensure that your nutritional needs are met.

Tools for 'less but better'

Here are some methods to help adapt your diet to your energy level and ideas to 'eat less but better'. With the help of the Plate Method for Persons with Low Energy Expenditure, Amount of Food and Estimation of Calories, the Iso Diet, and the Food Diary, you will be able to make significant changes without feeling discouraged or abstaining from good food. Use one of the methods or let yourself be inspired by all four.

Some rules of thumb apply regardless of which method you choose:

- Reduce your fuel intake by eating less carbohydrates and fat relative to what is usual
- Increase the volume of vegetables/salads you eat to more than is usual

Plate Method – a simple strategy for daily living

As a way to make your daily life simpler, we dusted off the old Plate method and adapted it for low calorie levels. This method helps you to lose weight but also provides guidance on how you should eat for good health in the long run. The perfect strategy if you don't like measuring food or counting calories!

Plate Method for Persons with Low Energy Expenditure

NB: This method has been developed especially for those with a small 'engine'. It is *not* the same as the method normally recommended for the able-bodied general population for whom other proportions and amounts apply.

Try this:

First, use a smaller plate. The part of the plate where the food is served should not be wider than 6 ½ – 7 ½ inches (17–19 cm) in diameter. Portions will appear generous even if the amount of food is less than what you are usually served.

Next, imagine that your plate consists of three parts: one large, which takes up half the plate and two smaller, almost equal parts for the rest of the surface. It looks a bit like this:

- » The *vegetable part*. You fill at least half your plate with as many warm and/or cold vegetables (non-starchy from above the ground) as you like: tomatoes, spinach, broccoli, lettuce, etc. This becomes the largest volume-wise and helps ensure that you feel satisfied without adding unnecessary calories.
- » The *protein part*. Your meat, fish, poultry, or egg/s serving takes up a little more than half of the surface that is left on your plate (the amount should be *slightly more than the size of the palm of your hand*).
- » The *carbohydrate/starchy part*. Your pasta, rice, grains, potatoes, or other root vegetables serving or bread fills the rest of the surface of your plate (the amount should be *slightly less than the size of the palm of your hand*).
- » *NB: Fat* intake occurs naturally in the various parts or can be added as required. This is the third important nutrient – the other two being protein and carbohydrate.

To help visualize the volume to eat of each nutrient, we use the concept of *the palm of your hand*. NB: In weight loss programs for the general population, the size of one's fist is often used to judge volume. However, for a person with very low energy expenditure this is frequently too much. The size of the palm of your hand (without your fingers) is slightly bigger than 1/3 cup = 3 oz (approx.) = 1 serving.

The picture with measurements gives you an approximate idea about proportions and what a portion size can look like for a person with low energy expenditure. Obviously, portion size is very individual. If you are not wrestling with weight gain, you may want to increase the volume of protein and carbohydrates a little. If you exercise a lot and use a lot of fuel, you will need to increase the volume of carbohydrates further. You will almost certainly feel hungrier and want to have a larger 'plate' (= portion).

PLATE METHOD FOR PERSONS WITH LOW ENERGY EXPENDITURE



'I was very active in sports until I got injured and I was used to eating larger portions. I found it very difficult to understand that my need for fuel dropped so much after the accident. The plate method has helped me to get my portion size straight.'

Peter 25, Paraplegia for 5 years

Try to maintain an image of the plate model with amounts and proportions in your mind's eye and use it every time you do or plan your grocery shopping and when you are about to eat.

Amount of Food and Estimation of Calories

In the Toolbox there are lists called *How Much You Can Eat in One Day*. There, you will find an approximate guide for various foods that can be consumed relative to calorie intake per day. Gradually, you will learn to estimate amounts without the need to check lists. There are two checklists: one for 1,300–1,500 calories per day and the other for 1,600–1,800 calories per day. Many of our patients and program participants like the lists and think they are easy to use and understand.

The Iso Diet – a low calorie diet

The Iso Diet is a low calorie, low carb diet designed for weight loss but which focuses on food for long term health. It is a Swedish concept that builds on a combination of weight loss diets from recent years. Iso is short for *iso caloric* – a diet where the calories come from equal parts of the three main types of nutrients: protein, fat, and carbohydrates.

It is our opinion that this diet can be a good alternative for persons with physical impairments and reduced energy expenditure. Essentially, you eat little, but as you get nutrients from all three different parts: protein, fat, and carbohydrates, the risk for nutrient deficiencies decreases.

The recipes and daily menus set out in this book are adapted to suit persons with very low energy expenditure who require a calorie intake of 1,200–1,400 per day. We present a framework for 1,200 calories per day with two snacks included for those who would like to stay at 1,400 calories per day. The idea is that our suggestions will lead to weight loss depending on which calorie level is chosen. However, they also serve as guidelines on how to think and plan for a healthier relationship with food for the rest of your life. This can be your new eating lifestyle!

If the servings in this book are too small for your needs related to how much you ‘burn’, then of course you will need to eat more. It’s the idea that’s important!

The basic idea behind the Iso Diet is that a balanced meal should include all three macronutrients, together with a large share of something ‘green’ and preferably with some berries too. To plan meals that include all essential nutrients is especially important for those who eat very little. Fundamental to this diet is that food should give a maximum feeling of fullness per calorie, stabilize blood sugar, and that meals are spread out over the day.

Protein is the macronutrient which satisfies hunger the most (per calorie) and is a best friend to all who want to maintain or lose weight. Eating more protein-rich foods such as meat, fish, poultry, and eggs keeps you feeling full and helps you avoid temptation. Protein also helps stabilize blood sugar.

Fat is another macronutrient that keeps you feeling full. So don’t *eliminate* fat from your diet, even though it contains a lot of energy. That said, do *reduce* the amount if your diet has been heavy in it.

Choose *carbohydrate-rich* food that contains *complex carbohydrates* with natural fiber – for example, eat whole grain breads. Complex carbohydrates raise blood sugar/glucose levels slowly (= low Glycemic Index (GI)) which is

advantageous in a weight loss context.

Simple carbohydrates raise blood sugar levels quickly (= high Glycemic Index (GI)) which is not helpful for losing weight. High blood sugar levels stimulate the body to produce insulin. Insulin has a variety of important functions, two of which are the storage of fat and to slow the rate of burning of stored fat when blood sugar levels are high.

You should therefore avoid foods that raise your blood sugar level in this quick way, especially foods that contain sugar and white flour – for example baked goods, such as cakes and cookies and also highly processed foods from the fast food industry. Neither one nor the other gives a feeling of fullness, so it becomes easy to eat too much. It is especially important to avoid sweetened drinks. Sugar from drinks enters the bloodstream quickly and raises the blood sugar level.

Regular meals spread over the day, prevent a drop in blood sugar and so help stave off hunger and cravings. This is especially important in a low calorie diet. If too much time elapses between meals, hunger and cravings take over and you will likely eat too much at the next meal. The more time that elapses since you last ate and the hungrier you are when you start your next meal, the longer it will take to experience a feeling of fullness. This increases the risk of overeating and/or eating the wrong things. When hunger and cravings take over, the body wants fast carbohydrates and fat. Both options are not especially filling and easy to overindulge in.

Most of the time, food items must be chosen separately to represent each macronutrient. However, some foods simultaneously contain two macronutrients and two examples are fatty fish like salmon that contains fat and protein, and beans that contain carbohydrates and protein.

Additionally, meals should include something ‘green’ by which we particularly mean those vegetables that grow above ground: tomatoes, spinach, bell peppers, broccoli, lettuce, rocket, cucumbers, zucchini/courgettes, beans, peas, and leafy herbs like parsley, coriander/cilantro, and basil. Together with berries, all of these fabulous greens can be consumed in whatever quantity you wish as they contain few calories per serving.

To our American readers in particular, we would like to recommend you get acquainted with the DASH Diet. The DASH Diet has many similarities to the Iso Diet (as well as the Mediterranean and Nordic diets). It will also provide you with very low energy recipes for 1,200 and 1,400 calories, and you will find appropriate units of measurement for cooking as well as suggested specific local foods.

Tip: Some healthy snack alternatives (150–200 calories)

- » 1 ½ cups sliced mango
- » 1 small low fat granola bar and 1 apple (medium size)
- » 2 tablespoons hummus, 1 oz honey whole-wheat pretzels
- » 4 tablespoons hummus with 1 cup of raw vegetables such as sugar snap peas, cauliflower, or broccoli
- » 1 ½ tablespoons peanut butter and celery sticks
- » ½ cup low fat cottage cheese, 1 banana (medium size)
- » Smoothies are also perfect snacks

Plan all meals to include foods that contribute:

- **Protein** – meat, fish, poultry, eggs, cottage cheese, or tofu (for those who prefer vegetarian).
- **Fat** – oil, nuts, avocados, or fatty sources of protein such as salmon, sardines, or herrings.
- **Carbohydrates** – pasta, rice, grains, potatoes, bread, fruit, root vegetables, or beans.

'I have made some major changes when it comes to food – you might even say radical changes. I've received positive feedback from the scales. I've lost a little over 22 pounds (10 kg) but I have also had fewer urinary tract infections which means I take fewer antibiotics. I have had to learn a lot about food and it also required a lot of discipline.'

Sten 50, Paraplegia for 30 years and an active tennis player

Sten's most important changes:

- » Eat a breakfast of eggs and vegetables – for example, cucumber, tomato, and broccoli plus a little ham or tuna for the full feeling they give.
- » Limit foods with a high carbohydrate content – for example, pasta, cereal, and bread.
- » Limit alcohol and completely avoid refined sugar.



It is recommended that you spread your 1,200–1,400 calories over the day like this:

- » Breakfast: approximately 300 calories
- » Snack: approximately 150–200 calories (NB: Have two snacks per day, one in the morning and one in the afternoon, if you want to consume around 1,400 calories per day.)
- » Lunch: approximately 400 calories
- » Dinner: approximately 300 calories

Food from each Food Group: Protein, Fat, Carbohydrates

Here is a sample menu for one day at 1,200 calories with meals based on choices from each food group.

Breakfast: 1 slice of bread (preferably whole grain) or 2 slices of crisp bread/crackers, scrambled eggs (2) + a 'smoothie' made from mixed berries, coffee, or tea.

Lunch: Pasta ½ cup (1.25dl = 0.12 l) (boiled) + meat sauce 3 ½ oz (100 g) + a large mixed leafy salad, water.

Snack: Low fat cottage cheese 3 ½ oz (100 g) + 5–10 nuts + as many berries or vegetables as you like.

Dinner: 3 ½ oz (100 g) salmon (steamed, boiled, or baked) + 1 ½ potatoes + steamed/boiled broccoli (as much as you like), berries for dessert, water.

Substitution lists for daily menus of 1,200–1,400 calories

Below you will find a description of how you can put together meals according to the idea of 'one food from each group' for a daily total of 1,200 calories. As mentioned previously, if your goal is 1,400 calories per day we suggest you have two snacks rather than one. This will bring you up to 1,400 calories with a maximum feeling of fullness.

BREAKFAST:

Sources of carbohydrates (choose from the following):

Crisp bread/flat bread	2 slices
Whole grain bread	1 slice
Oatmeal/porridge	½ cup (1.25 dl = 0.12 l) (when uncooked and can be eaten with ½ cup (1.25 dl = 0.12 l) skim milk)
Fruit	2 pieces

Sources of protein and fat (choose from the following):

Natural low fat yogurt	1 cup (2.5 dl = 0.25 l approx.)
Cottage cheese	3 ½ oz (100 g) (combine with 5–10 nuts)
Egg	2
Low fat (10%) hard cheese	1 ½ oz (40 g)
Ham/turkey/chicken	1 2/3 oz (50 g) (combine with 5–10 nuts)

Smoothies are easy to make. Mix all the ingredients in a blender and serve in a tall glass – delicious, nutritious, and filling!

PROTEIN DRINK/SMOOTHIE WITH A CHOCOLATE TASTE (180 CALORIES)

1 table spoon of dark cocoa powder
1 tablespoon of ground flax seeds
1 cup (2.5 dl = 0.25 l) of frozen or fresh strawberries

¼ cup/ 4 tablespoons of whey protein powder (can be chocolate flavored)

1 ½ (3.5 dl = 0.35 l) cups of water

SMOOTHIE WITH BANANA AND HONEY (130 CALORIES)

½ banana

Dash of cinnamon

½ cup (1.25 dl = 0.12 l) of Greek yogurt

½ teaspoon of honey

½ cup (1.25 dl = 0.12 l) of almond milk

Sardines/tuna	3 ½ oz (100 g)
Berries	as many as you like

Examples of breakfast combinations

- » 1 slice whole grain bread and scrambled eggs or cottage cheese + a small smoothie with mixed berries or just mixed berries
- » Fruit salad with cottage cheese or cheese sticks + a small smoothie with mixed berries
- » Cottage cheese and yogurt + berries and nuts
- » Oatmeal/porridge with berries and an egg or cheese on the side

LUNCH AND DINNER:

Sources of carbohydrates (choose from the following):

Potatoes	1 ½ pieces/meal
Rice (boiled)	½ cup (1.25 dl = 0.12 l) /meal
Bulgur (boiled)	½ cup (1.25 dl = 0.12 l) /meal
Couscous	½ cup (1.25 dl = 0.12 l) /meal
Pasta (boiled)	½ cup (1.25 dl = 0.12 l) /meal
Beans (boiled or canned)	1 cup (2.5 dl = 0.25 l) /meal
Root vegetables	7 oz (200 g)
Fruit	2 pieces (medium sized)

Sources of Protein and fat (choose from the following):

Fatty fish (salmon, sardines, herrings)	3 ½ oz (100 g) /meal
Fattier meats (mince/ground beef/pork)	3½ oz (100 g) /meal
Egg	2 per meal
Tofu	5¼ oz (150 g) /meal
Lean white fish	3½ oz (100 g) /meal – combine with a fat source
Lean meat (sirloin/fillet)	3½ oz (100 g) /meal – combine with a fat source
Shellfish	3 ½ oz (100 g) /meal – combine with a fat source
Chicken	3½ oz (100 g) /meal – combine with a fat source
Soybeans	7 oz (200 g) /meal (half the carbohydrate quota if you choose these)

Sources of fat (use only if your source of protein is lean):

Olive oil	2 tsp/meal
Avocado	½ /meal
Nuts	approx. 20

Vegetables and berries

Vegetables that grow above ground	as much as you like
Berries	as many as you like

SNACKS (2 SNACKS FOR 1,400 CALORIES):**Sources of protein and fat (choose from the following):**

Cottage cheese	3 ½ oz (100 g)/ (combine with 5 – 10 nuts)
Low fat (10 %) hard cheese	1 ½ oz (50 g)
Egg	2

Vegetables, fruit, and berries (choose from the following):

Berries	as many as you like
Vegetables	as much as you like
Fruit	½ (medium size)

DRINKS FOR ALL MEALS:

Water
Coffee
Tea

What you can do

The food guidelines described above have been developed to maximize your nutritional intake through healthy food choices despite the fact that you don't eat as much. We recommend that if you feel unsure about whether you are getting all the nutrients you need, you discuss this with a dietitian or a nurse who is knowledgeable about nutrition or speak with your doctor. It is important that you tell them you are a person with low energy expenditure, that they know not to recommend too much food (or foods that are energy-dense, thereby increasing the risk for unwanted weight gain).

Food Diary

Write in the Food Diary for one or two weeks to get a true picture of your eating habits.

Write down everything you eat and drink. Try to write amounts as well. Write immediately after you eat or drink as we tend to forget. Under "Comments" you can note if you ate somewhere out of the norm, or if you were invited out, etc. Also note if something in particular happened, if you were angry or happy, or anything else that may have had an impact on your food choices.

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
07.00–12.00							
12.00–16.30							
16.30–21.00							
21.00–07.00							
Comments							

After one or two weeks, analyze your Food Diary and try to see if there are any patterns. Do you eat three meals a day regularly, or do you skip meals? Do you get cravings for sweets and binge on cakes or candy between meals? Do you eat enough fruits and vegetables? If you have gained a lot of weight, is it because your portion sizes are too large or that your food and drink choices are too sugary?

Remember that persons with mobility impairments require nutritionally-dense, good food just like everyone else but have very small margins for consumption of energy-rich food! To avoid gaining weight, you should eat 'less but better' than most of the people around you! Go through your Food Diary and see what contains sugar and other simple carbs or a lot of fat and try to cut down on those items.

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This is what the food diary, used by us in the weight loss programs at the Spinalis Clinic and Rehab Station Stockholm, looks like.

Food Diary

A food diary is a great tool to identify your usual food habits. Research shows that we often underestimate our food intake (and overestimate our physical activity too).

Try this:

Keep a food diary for one or two weeks. Depending on whether it is a regular weekday or the weekend, we tend to eat differently, so it is useful to include all days of the week. Write down everything you eat and drink and try to record how much as well. It is best to write down what you eat and/or drink more or less immediately because it is easy to forget. Under the *Comments* section, note for example if you eat somewhere other than where you usually eat – maybe in the car or perhaps you're out somewhere special. It is useful to note if there is anything in particular going on that day. Are you feeling

happy? cross? tired? or is there anything else that could be influencing your food choices?

After one or two weeks, analyze your food diary and see if there is a pattern. Do you have three regular meals per day or do you skip meals? Do you get cravings for candy or cookies/muffins between meals? Are you eating sufficient fruit and vegetables? If you have gained weight, is it because you eat too much or that you drink too many sweet drinks or alcohol? Go through your diary and identify what contains excessive sugar or fat and try to eat less of these. Compare with the lists under *Amount of Food and Estimation of Calories* in the *Toolbox*.

You can even use the camera in your mobile phone to document what you eat and make a pictorial food diary. Take pictures of everything you eat and drink for a week, download the pictures, and illustrate your diary with them on your computer. Write the date, time, and what you ate.

You can also download apps and other web tools such as food diaries and calorie calculators for food value checks.

Losing Weight

There is a widespread misconception out there in the universe, that it is impossible to lose weight if you have a physical impairment that prevents you from exercising or training. This is a question which arises often and which we would therefore like to answer. We meet people every day in our clinics who have successfully lost 12, 25, 50, 75, and as much as 100 pounds (5, 10, 20, 30, and 40 kilograms) and even more, despite extensive physical impairments. This has been achieved by modifications to diet and without any increase in physical activity.

Naturally, it is easier to lose weight if you burn more calories through an increase in activity and by building muscle mass. However, the physiological effect of training is not as great as you might believe if your intention is to burn fat. The well-intentioned advice that you may hear, such as 'if you just exercised more you would lose weight' is a myth.

Indeed, physical activity is important for many aspects of health, not least of which the increase in metabolism which helps regulate and stabilize blood pressure, blood fats, and blood sugar. However, if you want to lose weight, it is most important of all to eat less!

For those who can walk, an increase in energy use by 150 calories (the equivalent of the calories in 1 ½ glasses of wine or the butter on three

Facts

Theoretically, any one of us can lose 3 lb (1.4 kg) per year by not drinking 1 pint (½l) of soda per week (10,500 calories in one year). Of course that is assuming one normally drinks that much per week. By refraining from drinking 1 pint of soda per day, a person could lose 18 lb (8.4 kg) per year (73,000 calories in one year).

sandwiches or 1 ½ bananas) requires about 30 minutes at a brisk pace. The tempo should be fast enough to increase body temperature and respiration somewhat. Obviously, to burn the same calories if the pace is slower, you need to walk for longer.

For wheelchair users to burn 150 calories takes considerably longer – probably somewhere between 50–60 minutes of self-propelling outdoors and at a good speed. However, self-propelling uses the relatively smaller muscles of the arms and shoulders. Even if this feels like strenuous exercise, it actually requires less energy than when working the legs. As mentioned before, the body's largest muscles are those of the buttocks and thighs.

The psychological benefits of physical activity

When it comes to weight loss, the psychological benefits of physical activity should not be underemphasized. Exercise enhances an awareness of what is going on in one's body. It becomes easier to distinguish between feelings of true hunger and cravings that stem from frustration. From a purely physiological perspective, the craving for sugar decreases because exercise leads to the release of stored glycogen which increases blood sugar levels. You become hungrier for 'real' food. It is also easier to take responsibility for your food intake when you have a sense of satisfaction due to exercise. If the exercise routine becomes regular, it also becomes easier to establish the ever so important regular eating habits.

However, this is not the entire truth. There are people who claim they gain weight from training because they feel hungrier and need to eat more.

Gentle weight loss

Weight loss typically involves not just a decrease in fat reserves in the body, but also a decrease in muscle protein and muscle mass. Because it is so important to retain muscle mass if you are a low energy user with slight muscle mass, it is extremely important to lose weight in an appropriate way. By which we mean gently. For example, the food and meal suggestions presented in the Iso Diet were designed to be safe for your health and to prevent loss of muscle mass. Weight loss should not take place too quickly. Contact a dietitian / a nurse with interest in nutrition / your doctor if you feel uncertain.

The ABCs of Weight Loss

Choose food which gives the maximum feeling of fullness per calorie. This is perhaps the most important advice to help you lose weight. If you eat too little, to seldom and too little protein, your blood sugar drops and activates that part of the brain which responds to survival threats. This will prompt you to obtain quick energy and you will feel in need of a snack.

Give your meals volume by filling your plate with large quantities of vegetables, remembering to choose more vegetables which grow above ground as they simply contain fewer calories than root vegetables.

Don't skip meals or forget snacks. Eat at least three meals per day and preferably one or two small snacks.

Choose light dairy products such as skim milk, low fat yogurt, and cottage cheese. Make other smart choices. Read the label and choose food that is not so energy-dense so that the amount you eat feels okay.

Drink water instead of sugary drinks with all meals and obviously when you are thirsty. Remember, soda is candy – just in a liquid form.

Reduce your alcohol intake. Alcohol contains many calories and also stimulates appetite.

Eat slowly so that you eat less. It takes approximately 20 minutes before you start to feel full. Research shows that people who eat fast often eat more and therefore consume more calories than those who eat slowly.

Practice mindfulness when eating. Take the opportunity to focus all your attention on what you are doing, each time you have a meal by yourself. Concentrate and enjoy! Avoid eating in front of the television.

Choose food that can be eaten warm. Warm food is more filling than cold. Another tip is to drink a cup of tea before meals or in the evening to prevent cravings.

Write in your food diary for a week or two every now and then.

Meal replacements? If you want to replace some meals with low calorie meal substitutes such as protein drinks or smoothies, we strongly recommend that you mix your own. Ensure you buy high quality products and choose natural varieties without added sweeteners.



Below is an example of a breakfast replacement which you mix yourself (either in a blender or with a hand blender) and dilute with water to the desired consistency.

RECIPE FOR A SMOOTHIE WITH BERRIES (300 CALORIES)

2/3 cup (1.5 dl = 0.15 l) low fat yogurt or lean quark

2/3 cup (1.5 dl = 0.15 l) skim milk

1/2 banana

1/2 cup (1.25 dl = 0.12 l) (or more) frozen berries (strawberries, blueberries, raspberries, or blackberries)

1/2 Tbsp cold pressed flax seed oil (for its healthy Omega-3 fat content)

10 tips from people who have been there and done that!

The following tips have been collected from our program participants who have either successfully lost weight, or succeeded in breaking a weight-gain trend and therefore maintained their weight.

'Make a menu for the week and do all your shopping in one go. Then there won't be so many poor quality quick fixes. Because of my MS, I am often very tired and so it is important I have a plan and healthy food at home. That's why I make shopping lists and plan my shopping for once a week on the day when I have the most energy and at the time of day when I am at my best. It's also a good way to save time and money.'

Elisabeth 48, with MS

'The Plate Method works well for me. It helps me to keep in mind amounts and proportions and how I should think when I plan my meals and shopping. If I go out to eat, I ask for lots of extra veggies and less potatoes, pasta, or rice. I managed to stop gaining weight and now I am slowly on my way to achieving my goal, which is to be 13 pounds (6 kg) lighter. I also use my own method: DTS or "Don't Take Seconds" but rather stick to your original plan!'

Marie 47, with Spina Bifida

'Keep a food diary! I really believe that writing down what I eat every day has helped me lose weight. Now I have a pretty good idea what it's all about, but I still keep a food diary. Then I really know what's going on!'

Lennart 60 (whom we wrote about in the beginning of this chapter),
Paraplegia for 44 years

'I count calories. That's one of my little tricks. I stay between 900–1300 calories per day. I've never been especially interested in food and nutrition and didn't really know much about it. That's why counting calories has helped me. I also use the National Food Agency's website, and have written up my own lists that I keep on the fridge door. It's scary when you see how many calories different things contain!'

Lennart 60 (same Lennart as above).



4 oz CHICKEN BREAST	- 190 calories
4 oz GROUND BEEF	- 200
4 oz SALMON	- 170
4 oz TUNA (IN WATER)	- 180
3 oz SHRIMPS	- 110
1 POTATO (SMALL)	- 64
1 EGG	- 70
1 APPLE	- 50
1 SLICE CHEESE (1 1/2")	- 40
1 SLICE HAM	- 83
1 PORTION PORRIDGE + SKIM MILK	- 200
1 SLICE WHOLE GRAIN BREAD	- 78
CRISP BREAD	- 45
1 ORANGE	- 60
BANANA	- 105
1 BEER	- 155
ONE SHOT WHISKEY	- 105

'Being in a weight loss club on the net has been a great help. I get lots of info on food and calories. It helped me change my attitude toward food and to understand that there are no shortcuts.'

Rikard 40, Tetraplegia for 22 years

'I make sure that we prepare proper food on the days when I have assistants that are good cooks. Then we make big batches and freeze in individual portions and I heat them up on the other days.'

Erik 45, Tetraplegia for 11 years

'Rewards are important – small and major. It doesn't have to be food, it can be something else too. But you can't live like a monk! Sometimes you have to plan for parties where you treat yourself to something you're really longing for!'

Gunnar 52, Tetraplegia for 35 years

'I have assistants in the mornings. I ask them to prepare fruit and vegetables that I can munch on at work if I get the urge. For example, they peel oranges or carrots for me or quarter apples.'

Gunnar 52 (same Gunnar as above).

'When I get the urge, I snack on small pieces of dark chocolate, unsalted nuts like almonds, or dried fruit. That's been my salvation!'

Karolina 47, Tetraplegia for 5 years

'I completely stopped drinking juice for breakfast and lost 10 pounds (4.5 kg) in three months. Juice is a real calorie trap because it seems so healthy!'

Jan 68, Paraplegia for 20 years

Tip: Three breakfast alternatives

Breakfast 1. (280 calories) from DASH

- » 1 ½ oz shredded wheat squares
- » 1 cup non fat milk
- » ½ cup blueberries

Breakfast 2. (290 calories) from DASH

- » 1 cup of asparagus, cut up
- » ½ cup of onions, chopped
- » ½ cup of broccoli, chopped
- » 2 eggs
- » (Sauté onions, asparagus, and broccoli in a pan and add the eggs)
- » 1 small low fat granola bar

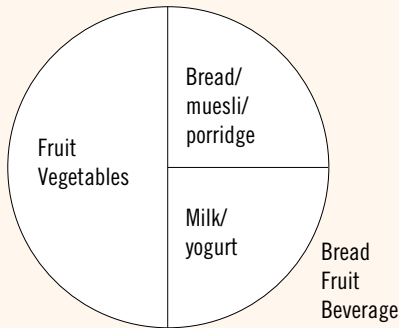
Breakfast 3. Smoothie (310 calories) From Eat Well, Live Well

- » 1 kiwi (peeled)
- » ½ cup of strawberries
- » ½ cup of raw oatmeal
- » 3 tablespoons of Greek yogurt
- » Water (you decide on the amount to obtain preferred thickness)
- » 1 tablespoon of ground flax seeds
- » (Put all ingredients in a blender and mix)

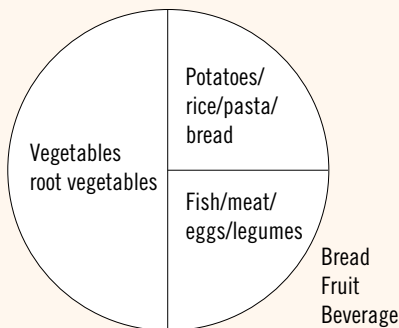
Toolbox: Amount of Food and Estimation of Calories

Recommended distribution of food in meals

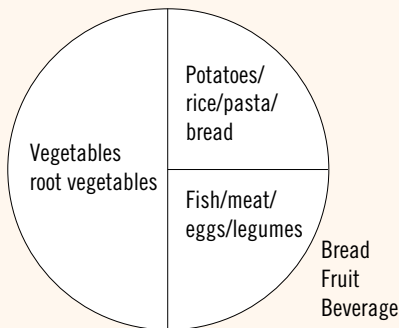
Breakfast



Lunch



Dinner



CHECKLIST: 1,300–1,500 calories (approx. 1,6 oz (45 g) fat and 0,6 oz (18 g) fiber)

This is how much you can eat in one day!

BREAKFAST/SNACK

Low-fat milk/yogurt	1 ¾ cup (4 dl)
Bread	2 slices
Crisp bread	1 piece
Light margarine	3 tsp
Cheese 17%	3 slices (with cheese slicer)

FRUIT AND VEGETABLES

Recommended total minimum quantity 17,5 oz (500g)/day (2 fruits and a minimum of 1 1/3 cup (3 dl) vegetables/day)

Fruit	2 per day
Fresh or frozen vegetables	unlimited

COOKING FATS

Margarine/oil	1 tbsp
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MAIN MEALS – two per day

(The checklists for LUNCH and DINNER look the same)

Carbohydrate-rich food options, for example, one of the following:

- 2 potatoes (boiled, the size of a large egg)
- rice (boiled) 2/3 cup (1.5 dl)
- pasta (boiled) ¾ cup (2 dl)

Protein-rich food options, for example, one of the following:

- meat/ground beef, pre-cooked weight 3 ½ oz (100 g)
- fish (fresh or frozen) 4 1/3 oz (125 g)
- low-fat sliced meats 2 ½ oz (70 g) (3 slices)
- legumes (beans/lentils) approx. 1 cup (2.5 dl) (boiled)

Checklist content and concept from *Obesitas: arbetsbok för dig som vill gå ned i vikt (Obesity: A Workbook for those Who Want to Lose Weight)* by Ingela Melin

Toolbox: Amount of Food and Estimation of Calories

CHECKLIST: 1,600–1,800 calories (approx. 2.1 oz (60 g) fat and 0.8 oz (22 g) fiber)

This is how much you can eat in one day!

BREAKFAST/SNACK

Low-fat milk/yogurt	1 ¾ cup (4 dl)
Bread	3 slices
Crisp bread	2 pieces
Light margarine	4 tsp
Cheese 17%	4 slices (with cheese slicer)

FRUIT AND VEGETABLES

Recommended total minimum quantity 17,5 oz (500g)/day (3 fruits and a minimum of 1 1/3 cup (3 dl) vegetables/day)

Fruit	3 per day
Fresh or frozen vegetables	unlimited

COOKING FATS

Margarine/oil	1 tbsp
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MAIN MEALS – two per day

(The checklists for LUNCH and DINNER look the same)

Carbohydrate-rich food options, for example, one of the following:

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- pasta (boiled) ¾ cup (2 dl)

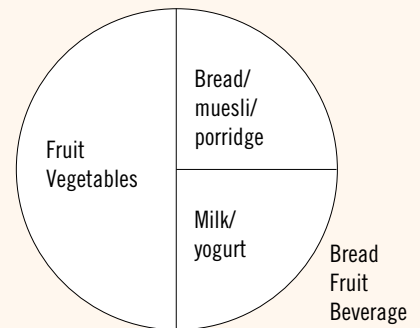
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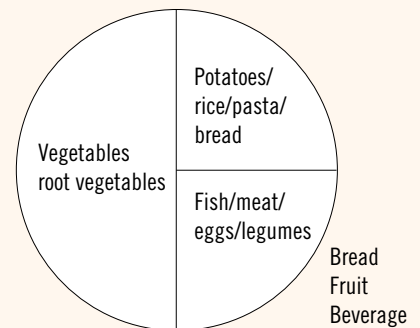
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Recommended distribution of food in meals

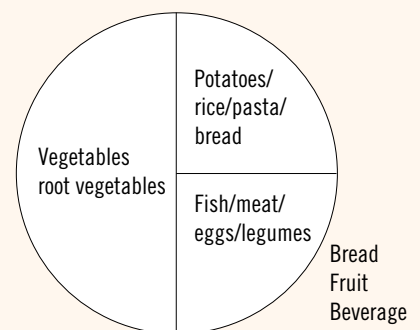
Breakfast



Lunch



Dinner



Anna-Carin Lagerström is a registered physiotherapist MSc, health educator, and nutrition counselor. She was responsible for the early introduction of health promotion in neuro-rehabilitation, specifically SCI rehabilitation in Sweden and has lead numerous R&D (research and development) projects in the field. With support from the Spinalis Foundation, she developed a concept referred to as the 'Spinalis Health Navigator®'. Anna-Carin's work is divided between conducting health dialogues with patients at The Spinalis Clinic/Rehab Station Stockholm and researching further development of the aforementioned concept. She is also frequently engaged as a lecturer and educator for health professionals both in Sweden and internationally.

'I would like to dedicate my part in this book to Carin Forsberg, my mother, who died in May 2011 at the age of 86. Mother lived with spinal cord impairment caused by an infection for more than half of her life. With her sunny disposition, positive attitude toward life, courage, and her inherent and uncomplicated approach to good health, she has been my inspiration and my personal role model.'

Kerstin Wahman is a registered physiotherapist, PhD. She is affiliated to the Karolinska Institute (Karolinska Institutet) and from June 2013 is head of the research and development unit at Rehab Station Stockholm. Among other projects, she is also involved in methods development and research in the area of health promotion within rehabilitation. Kerstin's PhD thesis focused on the need for a healthy lifestyle to reduce the risk for cardiovascular disease in persons with SCI. One of her latest projects aims to measure energy consumption in individuals with SCI and other neurological diagnoses, thus creating the basis for a future consumer-accessible database. Kerstin also has a keen interest in how mindfulness programs can complement the lifestyle panorama in rehabilitation.

'In the 1980s, I was given an opportunity to work with a non-profit patient organization RG Active Rehabilitation. That's where my interest in working with physical activity as a means to experiencing an active and independent life began to grow. Seeing firsthand how crucial lifestyle change can be, for an individual's health and quality of life, inspires me and gives me energy.'

