FIT FOR LIFE

A GUIDE FOR ADULTS WITH A SPINAL CORD IMPAIRMENT


Exercise


Nutrition


Psychology

This guide is a great resource to help you get fit for life. It starts with the basics and teaches you how to lead a healthy, well-balanced and active lifestyle, and allows you to progress at your own pace. The resource includes spinal cord impairment (SCI) specific topics, advice and adaptations so that all the information you need is in one place. You can also pick and choose from the areas you are most interested in. If you then choose to take up a sport, you can download the Fit for Sport section which will help you understand how to adjust your training and nutrition, and how to use some psychological skills to improve your performance. No matter what level you are currently at, or even if you are just getting started, this guide can help you to achieve your own personal goals. Most importantly this guide will hopefully give you the confidence to lead a healthy, more active lifestyle and maybe try something new. **Good luck!**

ANDY BARROW

ParalympicsGB Wheelchair Rugby Athlete

3 x Paralympian

3 x European gold medallist

"Having played Wheelchair Rugby for many years I understand the importance of training, nutrition and psychology for the elite athlete. However, overcoming barriers to physical activity and exercise and eating well have become even more important now that I have retired. I may not be an elite athlete anymore but I still want to maintain my health and fitness. "

IS THIS SECTION FOR ME?

FIT FOR LIFE

- ✔ Do you want to get fitter and healthier?
- ✔ Do you currently do little physical activity and exercise?
- ✔ Do you have limited nutrition knowledge?
- ✔ Do you want to learn and/or recap the basics?

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FIT FOR SPORT

- ✔ Do you already regularly (at least three to four times per week) take part in exercise and/or sport?
- ✔ Do you want to improve your performance?
- ✔ Do you want to tailor your nutrition to your sport?
- ✔ Do you want to understand how to use some psychological skills to improve?

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FIT FOR LIFE

From a health perspective, regular exercise can help make everyday living easier and also more enjoyable.

Other benefits include:

- Improved well-being and decreased stress
- Improved health (lower cholesterol and blood pressure, reduced risk of obesity, diabetes and heart disease)
- Weight control
- Improved ability to perform activities of daily life
- Increased fitness (better breathing, increased strength and endurance)
- Improved balance and co-ordination
- Improved range of movement and joint mobility
- Injury prevention (over-use injuries, pressure sores and postural issues)

It is well-known that if you want to be healthy then physical activity and/or exercise should form part of your lifestyle.

PHYSICAL ACTIVITY = Any action or movement that requires you to contract your muscles.

EXERCISE = A planned and purposeful action from which we aim to improve our fitness levels and our health.

You may sometimes face potential barriers to exercise but remember that many activities can be adapted to suit your needs. Most importantly, it can be fun!

HOW TO OVERCOME BARRIERS TO EXERCISE

Taking part in some form of physical activity or sport is necessary for you to become physically fit.

Additionally, activity can help you become mentally fit. Exercise can help improve health and well-being by improving mood, reducing stress and decreasing depression. It can also help boost your self-esteem and give you confidence in other areas of life. To gain these psychological benefits you must maintain a regular exercise routine but this isn't always easy. As a disabled person you may face a number of barriers to physical activity which can make becoming and staying active a challenge.

Here are a few of the common barriers and how you can try to overcome them:

"I really don't know where to start"

The most important thing is to find an activity that you enjoy doing so that you will keep doing it. Join a friend at the gym, try an exercise class or head to the park with your family; adding a social element can make it much more fun. Don't be afraid of trying new and unfamiliar activities as these can often surprise you and leave you wanting more. Find some like-minded people to exercise with in your area, you will help motivate each other. Also visit www.parasport.org.uk for information on what sports are available for disabled people and to help you find local sports clubs.

"I just don't have the time"

Many people live hectic lifestyles that are busy with both work and family commitments. Not having sufficient time to exercise is a genuine concern. Difficulties with travel can make your trip to an exercise venue annoyingly long or expensive and so it is important to consider where else you might be able to exercise. A long commute to your local gym is no longer needed if you can do a workout at your local park or even in your own home or garden. The amount of exercise you need to do to gain benefits is often overestimated too. As little as 30 minutes of moderate intensity activity a day, five times a week is enough to help you feel physically and mentally fit. Multiple bouts of at least 10 minutes are also just as good; how about before or after work and a short session during your lunch hour?

"My local facility isn't accessible"

Accessibility is a common issue faced by disabled people. However, you do not necessarily need a gym or leisure centre to become more active. You can do lots of exercises with minimal equipment in many different environments such as in your home or at the park. There are plenty of ideas about alternative ways to train in the physical activity and exercise section. However, if you do fancy the gym, the Inclusive Fitness Initiative (IFI) has an application where you can find a local club that has accessible equipment for disabled people. Visit www.efds.co.uk/inclusive_fitness/ifi_gyms.

"I feel too tired to exercise"

Many people say they don't exercise because they are too tired. This may be because of your medication so speak to your treating clinician and see if there are any other options. If you have a higher level SCI you may also need to balance the number of activities you do in a day to ensure you get the most out of your exercise regime. You might be pushing yourself everywhere and doing everything around the home but could you take a little bit of help to free up your time and energy to do something you enjoy? It is also worth considering that regular exercise can actually reduce fatigue and help you sleep better. After a few weeks of regular physical activity you will hopefully notice your energy levels improve.

"Because I've always been rubbish at exercise and sport"

You may have disliked PE at school because of an emphasis on competitive sport, the group atmosphere, a lack of choice or that age-old classic of being picked last. It may be hard to forget these feelings but remember that as an adult you can choose exactly what type of exercise or sport you do, who you do it with, when and also whether you do it for leisure or competitively; you are in control! Finding a type of exercise that you enjoy will hopefully prolong your involvement.

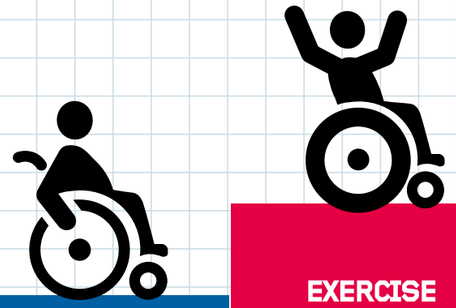
PHYSICAL ACTIVITY AND EXERCISE

Reducing sedentary behaviour and being active can help you avoid the poor health and illness associated with a lack of physical activity which becomes more important with the effects of a SCI on body function. The general physical activity and exercise guidelines do not differ greatly from those for non-disabled people. This guide discusses specific topics, adaptations and areas of emphasis for adults with a SCI.

The main goals of Fit for Life are to improve function for daily living and to stop the onset of problems associated with inactivity.

Your individual goal may be to wheel to the shops without getting out of breath, to transfer in and out of your chair more easily, or to take up a new sport. Whatever you wish to achieve, getting to grips with the basics is a great place to start.

If you are newly injured, pregnant, prone to autonomic dysreflexia, or if you suffer from other medical conditions you should seek advice from a health professional such as your general practitioner (GP), treating clinician, Spinal Cord Injury unit or physiotherapist. They should provide you with further advice regarding the type and amount of physical activity and exercise that will suit you.



NO EXERCISE	EXERCISE
Decreased exercise tolerance or inability to exercise	Improved function and performance in activities of daily living
De-conditioning	Improved fitness
Medical complications, illness associated with obesity and secondary impairment	Improved health and reductions in health complications

Figure 1. The effects of no exercise vs. the benefits of exercise.

General Guidelines

If you currently do very little physical activity or exercise, you should start by increasing everyday activities. This will help to improve your health, increase your energy output and therefore help weight management. Consider some of the following ideas:

- Gardening
- Cleaning and other household chores
- Washing the car
- DIY
- Wheel to the shops rather than getting in the car
- Pushing around a local park or trail
- Playing games with family members
- Dancing
- Consider volunteering for a local organisation, charity or sports club

Do what you can and take breaks when you need to. Once you feel ready you can consider progressing to some planned exercise sessions. An exercise session normally consists of three parts; a warm-up, the main session and a cool-down.

Organised Exercise

Warm-up

An effective warm-up is designed to prepare your body for exercise.

5-10 minutes low to moderate intensity activity will raise your heart rate and increase your muscle temperature.

You should gradually increase the intensity of activity to that of which you will be exercising.

Try to include the movements that you will use during the activity you are warming-up for.

Main Workout

In the initial stages it is important that you choose an activity you find enjoyable. Do what you can and build on it until you reach the recommended 30 minutes for moderate intensity exercise (you should be able to have a conversation), or 20 minutes for vigorous intensity exercise (you can't say more than a few words without pausing for breath).

The type of exercise you do will vary and may depend on the level and completeness of your SCI but the duration and intensity should gradually increase as your fitness develops. Performing regular passive strengthening exercises is also a great way to get started and to keep you moving.

Cool-down

5-10 minutes gentle exercise/activities which gradually decrease large muscle group activity and help to aid the clearance of waste products.

Stretching exercises for multiple joints/muscle groups.

The cool-down is also a good time to reflect on your session.

The Main Components of Fitness

Fitness is comprised of many different elements but here we are going to focus on **Flexibility**, **Strength** and **Aerobic** fitness. Evidence suggests that disabled people gain similar health benefits and adaptations to exercise as non-disabled individuals. See page 14 for the recommendations on how long and hard your exercise session should be.

As a wheelchair user it is quite common to experience postural problems due to slumping and/or you may have a rounded posture caused by tightness in your chest and front shoulder muscles, which can sometimes lead to shoulder problems. Flexibility training that focuses on the shoulder region along with strengthening exercises for your back muscles can help to prevent this.

If you spend the majority of your day in a sitting position this can cause tight and weakened hip flexors (the muscles that are designed to move your thigh towards your trunk). It is therefore good practise to stretch the muscles around your trunk, hips and knees on a regular basis.

Flexibility

Flexibility is simply the range of motion you have around a joint. Take a gymnast for example: they are clearly flexible because they are able to put their bodies into positions that many of us would not even attempt. The American College of Sports Medicine (ACSM, the largest sports medicine and exercise science organisation in the world, www.acsm.org) guidelines state that adults should try to do flexibility exercises at least two to three days per week to improve their range of motion.

Here are some tips to help with your flexibility:

- Stretching is most effective when the muscle is warm so always do some light to moderate aerobic activity beforehand.
- You should move into a stretch to the point of tightness or slight discomfort and then hold.
- Hold static stretches (once you are in the stretch position you do not move) for 10-30 seconds during the warm-up, or use dynamic stretches that mimic the movements of the subsequent activity.
- During a cool-down stretch all major muscle groups that you used in your workout and any smaller muscles that you may have targeted (20-30 seconds per stretch). Static stretches can be useful for this.
- Regular stretching should also be performed on days you are not exercising to maintain a normal range of motion around your joints.
- To develop flexibility further it is worth holding stretches for at least 60 seconds or alternatively repeat the stretch to accumulate this time.

Strength Training

Strength training in the initial stages of a programme is defined as anything that challenges your body above its norm in terms of lifting or moving weight. Strength training does not have to take place in a gym; lifting a bag of sugar, tins, bottles or simply your own body weight can be classed as strength training and you can make it a good workout depending on the weight, number of repetitions, and exercise selection. As a wheelchair user a great deal of strength is required in your shoulder, arm and trunk muscles to perform daily activities such as transferring in and out of your chair. Strength training can be extremely useful in making these tasks feel easier.

Out of the gym, strength training can be done using a number of alternatives:

- Partner resisted strength training. You can still do the same movements as you would on gym machines but with a partner resisting these movements rather than a weight. These can be done at home, at work, in the park, almost anywhere!
- You can do some exercises using simply your own body weight such as press-ups, dips or chin-ups.
- For those with an impaired grip you could also consider using small wrist weights. These simply wrap round your wrists and tie on with Velcro straps. Thus, arm movements can be performed but with greater resistance.
- Elastic tubing (often called dyna bands, therabands or clini bands) are simply pieces of elastic which offer more resistance the greater you stretch them. Again these give you the freedom to mimic many of the movements that can be done in the gym.
- Ensure you stabilise your wheelchair prior to performing any free weight or theraband type exercises.

If you choose to go to a gym perform exercises without any or with minimal weight when learning new techniques. Once you have mastered the technique (ideally under supervision) choose a weight that will produce a moderate amount of muscular fatigue during the number of repetitions you have planned. Your chosen weight should allow you to complete a full set without stopping and you should be able to maintain good technique throughout. When planning a session ensure you include a balance of exercises for your chest and back muscles to prevent any imbalances between the two.

If you have limited trunk function and struggle with your balance fixed resistance machines, which can be found in most gyms, can help facilitate exercise because the need to stabilise your body is reduced and they help guide the direction of movement.

Aerobic Training

Aerobic training is any activity that raises your heart rate and gets you out of breath for a sustained period of time. It trains the cardiovascular (heart, blood and blood vessels) and respiratory (lungs) systems to help reduce fatigue and improve your ability to perform activities of daily living. There are various forms of aerobic exercise such as walking, wheeling, aerobics classes or playing a competitive sport. See page 16 for examples of different types of exercise you could try.

Wheelchair Users

You are using the same muscles to perform activities of daily life as well as during exercise.

To help prevent your upper body becoming overused consider all three of the above components (flexibility, strength and aerobic training):

1. Stretch the front shoulder and chest muscles to prevent tightness;
2. Strengthen the muscles of the upper back and shoulder region (e.g. push backwards or perform a rowing action); and
3. Vary the type of exercise you do on a regular basis.

TABLE 1. Goals and Recommendations for Flexibility, Strength and Aerobic Training

Type of exercise	Goals	Intensity/Frequency/Duration
Flexibility • Stretching	• Help avoid joint contracture* • Help prevent injury	• Before and after aerobic or strength exercise or as a standalone session • At least two to three days per week
Strength • Weight machines/wrist weights/ dumbbells/therabands/medicine balls	• Improve strength • Ensure balance of all muscle groups	• Two to four sets of 8-12 repetitions for each exercise • At least two days per week
Aerobic • Arm cranking • Hand Cycling • Pushing • Seated aerobics • Swimming • Wheelchair Sports	• Increase endurance by improving your ability to use your available muscle groups • Maximise independence (e.g. perform transfers in and out of the car) • Make pushing your wheelchair easier	• Moderate-vigorous aerobic activity/ Rating of Perceived Exertion (RPE) ** of 12-16 • At least two days/week • At least 20-30 minutes per session

NOTE
*Contractures (permanent shortening of the muscle) are usually caused by paralysis.
** Rating of Perceived Exertion (RPE) (scale 6-20) will be explained in more detail on page 29.

> Not got enough time?

Evidence also suggests that you can accumulate the desired amount of cardiovascular training in multiple, smaller chunks of time such as 10 minute bouts of wheeling/Hand Cycling or resistance exercises. This is useful if you are starting to exercise for the first time or if you simply don't have big blocks of time to spare.

Safety Always Comes First

Please consider these safety points before starting your exercise programme:

1. Consult your doctor if you are considering starting an exercise programme for the very first time or if you experience any adverse consequences.
2. If possible consult a registered exercise professional or an accredited physiologist with good knowledge of your impairment and the exercise implications (e.g. regulating your body temperature or the effects of your medication on blood pressure).
3. If you have a mark, sore or cut on a pressure bearing area, do not do any exercise which will aggravate it.
4. Always stabilise your chair prior to performing resistance/theraband type exercises.

NOTE:
Quality is more important than quantity! More is not always better so exercise within your own limits and don't push yourself too much if you are new to exercise.

What Type of Exercise Can I Do?

The most important thing is to find something that suits you and that you enjoy doing. There are always plenty of options and alternatives.

TABLE 2. Types of exercise suitable for people with a SCI.

Type of Exercise	Advantages	Disadvantages	Adaptations/Advice
Arm cranking	Found in most gyms. Mechanically more efficient than wheelchair propulsion.	Remaining seated for long periods on a hard surface can increase the risk of pressure sores. Try using a pressure cushion to reduce this risk.	Flexion mitts or straps can be used if you have limited grip.
Circuit training	Can be divided into classic circuits and weight training. A weights circuit can be interspaced with high revolution/ low resistance arm cranking.	Access only in some fitness gyms.	Use a number of exercise stations and alternate between muscle groups. Use a set number of repetitions or a set time. Rest after each activity or when each circuit is complete.
Hand Cycling	Relatively efficient form of locomotion with a gearing system to accommodate difficult terrain.	If a competition handbike is purchased it can be expensive and require a large storage space.	Arm crank attachments can be used on everyday wheelchairs at minimal cost.
Pushing	Specificity training for Wheelchair Sports. Can be performed almost anywhere within reason.	Risk of overuse injuries due to increased stresses to the shoulder if training is not structured appropriately.	Use a hybrid day chair or sports wheelchair and use the correct tyres for your chosen terrain. Use a familiar circuit to monitor progression.
Rowing	Good all-round conditioning. It uses opposite muscle groups to those used during chair propulsion.	Back strain may result if technique is incorrect.	A stationary seat can be incorporated into the Concept Rower (found in most gyms) enabling an isolated upper body rowing action.
Seated aerobics	Inexpensive. Can be performed at home or as part of an adapted exercise class.	Aerobics classes are only available at participating sites.	Therabands can be incorporated into the routine. Ask about public classes that can accommodate wheelchairs.
Swimming	Good cross-training as the water supports your body weight.		A swim-jogger buoyancy vest can be used for aqua-jogging or floats can help support inactive limbs.
Tai Chi/Yoga	Improves balance, posture, flexibility and breathing patterns. Inexpensive.	Those with limited trunk stability may struggle.	Seated Tai Chi routines have been developed. A focus on slow movements may help improve core stability.
Wheelchair Sports e.g. Tennis, Rugby, Basketball, Curling	Good cross-training or specific training for a given sport. Competitive and social.	You may need to buy some additional equipment. You may need to travel to find your closest team.	Strapping can be used to help stabilise you in your chair. See if you can borrow equipment when trying a sport for the first time. Use the Parasport website to find a local club to play your chosen sport. www.parasport.org.uk

Exercise Considerations

- If your level of weight-bearing activity is low you may be susceptible to osteoporosis. The bones of your legs may therefore become weak leaving you more likely to get a fracture if you fall. Hence, your safety and stability during any exercise is of utmost importance.
- Pressure-bearing areas may be prone to ulceration. To help prevent sores developing you will need to periodically relieve these areas during daily activities and exercise.
- Make sure that your bladder routine can integrate with your chosen exercise programme. In particular make sure that the bladder is empty prior to exercising.
- It is also important to tell your coach if you are on medication to help regulate blood pressure or reduce pain and spasms such as Tramadol or Tizanidine.

Individuals with Tetraplegia

- Aerobic capacity (the ability of your body to transport and use oxygen) is lower in individuals with tetraplegia compared to non-disabled individuals and those with paraplegia. However, it can be improved by participating in endurance-based activities/sports.
- Exercise also involves training your respiratory muscles, including the diaphragm, which can become fatigued during exercise. If you have high tetraplegia (above C6) it is therefore often suggested that you fix your trunk using a trunk belt or abdominal binder to prevent your diaphragm from this stress.
- Experiment with different types and positioning of strapping to help improve your trunk stability. Non-elastic and elastic straps and binders can help maintain trunk balance during wheelchair exercise.

Thermoregulation

You may experience some problems regulating your body temperature due to your impairment, which may put you at greater risk of overheating during exercise. The magnitude of this effect is dependent on the level and completeness of your SCI. This is mostly due to a reduction in your ability to sweat and a reduced blood flow to the skin, both of which help to remove heat from the body. Here are some tips to help prevent overheating:

- For those who do sweat it is important that you drink enough fluid during exercise, especially in hot conditions, to help prevent you from dehydration and consequent over-heating.
- Avoid training in very hot conditions. If you are training/ competing abroad try to train in the cooler parts of the day (morning and evening) or in an air-conditioned facility.
- Wear lightweight, loose clothing.
- Use passive cooling strategies such as cooling vests, fans or water sprays to reduce your temperature.
- On the flip side, use hot drinks and layers of clothing in the winter months to stay warm.

Considerations for Spina Bifida

- If you have a shunt or have had scoliosis surgery you should discuss exercise with your doctor and always avoid excessive trauma to the shunt and tubing.
- If foot or leg swelling occurs during exercise elevate your legs. If swelling persists discuss this with your doctor and consider using compression stockings to help keep the swelling down. Monitor skin closely for breakdown in areas of swelling.
- If you have a latex allergy always check beforehand to make sure that the exercise equipment you plan to use is not made of latex. Many equipment manufacturers offer latex-free versions of their products.

Autonomic Dysreflexia (AD)

AD is a condition that can occur in anyone who has a spinal cord injury at or above the T6 level. It is a sudden and exaggerated autonomic (involuntary) nervous system response to stimuli below the lesion level such as constipation, a blocked catheter, pressure sores or an overstretched bladder. It causes your blood pressure to rise to potentially dangerous levels. You must learn the early signs of this condition developing such as a slow pulse, goose pimples, headache, hypertension, sweating above your lesion level and cold, clammy skin. For more information please consult your GP.

NUTRITION

Key Features of a Healthy Diet

Fruits and Vegetables...

Include plenty of colour and variety.

Carbohydrates...

Found in foods such as potatoes, pasta, rice, bread and breakfast cereals.

Fat...

Some unsaturated 'healthy' fat found in foods such as oily fish, olive oil and nuts should be included in your diet but try to avoid eating excess saturated fat in products such as cakes, pastries, fried and processed foods.

Protein...

Found in foods such as lean meat, fish, eggs or vegetarian alternatives.

Fluid...

Such as water, tea, squash, juice, milk and fruit will help maintain hydration, which is important for the day-to-day functioning of the body.

Calcium...

Rich food sources include milk, cheese and yoghurt.

An important component of being 'Fit for Life' is your nutrition. With such a wide variety of food products on the market and the increased availability of convenience foods, it is important to make sure we know how to eat a healthy, well-balanced diet. It is therefore important to understand the basics.

Having a SCI does not change the general recommendations on how to eat a healthy diet, however there are a few extra issues to consider. The biggest change is likely to be the amount of food you will need to eat on a daily basis because this is often reduced, and for this reason you may have concerns about your body weight. These topics and more will be covered in this section.

The components for a healthy diet provide the body with what it needs to fight infection, help prevent illnesses such as heart disease and some forms of cancer, and to maintain your day-to-day health so you can get on with leading an active lifestyle. Now let's take a closer look at each component:

Carbohydrate foods are an important source of energy, vitamins and minerals and should be included in any healthy diet. It is impossible to make general statements about the amount of carbohydrate needed by an individual with an SCI. However, if a large proportion of muscle within the body is not being used it is expected that requirements will be lower than the figures usually used for non-disabled athletes. Quantities should therefore vary according to how active you are (e.g. more activity requires more energy and therefore more carbohydrate).

Fibre

Wholegrain and wholemeal versions of carbohydrate sources are a great source of fibre. Other sources of fibre include vegetables, fresh (with the skin!) and dried fruit, beans, nuts and oats. You should adjust your own fibre intake to maintain personal bowel movement. Some individuals find that different sources of fibre are more effective in maintaining bowel function than others and for this reason more emphasis may be placed on fruits and vegetables by some. Note that some common medications may also affect bowel function. If you wish to analyse your bowel actions further please search online for the Bristol Stool Chart.

Fruits and Vegetables are good sources of fibre and provide a wide range of vitamins. They also contain "antioxidants", chemicals which will help fight infection and prevent disease. The ideal target is 5-a-day; one portion might be one medium fruit such as an apple or orange; one small plate of salad; one tablespoon of dried fruit; three tablespoons of cooked vegetables or a small glass of fruit juice. Include a wide variety of types and colours. Boil or microwave vegetables in minimal water, try steaming, and keep cooking time to a minimum to prevent vitamins being lost.

Protein is needed for growth and repair in the body and it is therefore important to ensure you include adequate amounts of protein at a time of wound healing i.e. if you have pressure ulcers. Opt for lean, low fat versions and use cooking methods that keep fat to a minimum such as grilling, poaching, boiling or steaming. Including some protein at each meal will help you meet the recommended two to three portions a day. Meat (red and white), fish, eggs, cheese, milk or vegetarian alternatives such as beans, lentils, tofu and Quorn are all good sources. Red meat can also help ensure an adequate iron intake but if you choose not to eat it, take care to eat other iron-rich foods.

Iron is important because it is used in the formation of haemoglobin, a part of the blood that carries oxygen around the body. Those at risk of low haemoglobin levels, also known as anaemia, include vegetarians, endurance athletes, teenagers and females. Foods containing iron include offal, fish such as pilchards, salmon and sardines, eggs, green leafy vegetables, nuts, pulses and breakfast cereals fortified with iron. The absorption of iron can be aided by eating foods containing vitamin C e.g. tomatoes, green leafy vegetables, peppers and citrus fruits at the same time as iron-rich foods, and can be hindered by drinking caffeinated drinks such as tea and coffee, so drink them after your meal instead.

Calcium is important for strong bones. If you are unable to perform weight-bearing exercise, you may be susceptible to osteoporosis and at risk of a fracture if you fall. It is therefore important to ensure that your calcium intake is optimal to aid bone health.

Taking enough calcium into the body from food is possible and aiming for three portions of calcium-rich foods a day will help you ensure you meet your needs. Table 3 highlights some calcium-rich foods. If you can't tolerate milk or dairy products, or have a family history of osteoporosis, you should take extra care to ensure your intake is sufficient and you may consider using a supplement if you struggle to meet your needs.

Vitamin D aids the absorption of calcium to support bone health. It is also an important vitamin to consider for immunity as it may enhance your ability to fight infection.

The main source of vitamin D is produced due to the action of the sun on your skin but small amounts can also be obtained from the diet from foods such as eggs, offal, oily fish and fortified margarines, juices or cereals. Supplementation is also an option during the winter months or for athletes that spend a lot of their time training indoors.

As a minimum aim to get 20 minutes sun exposure three times a week. Safe exposure to the sun is important so do not stay out long enough to get burnt.

Table 3. Calcium Content of Foods

Food	Quantity (one portion)	Amount of calcium (mg)
Semi skimmed milk	1/3 pt/200 ml	237
Skimmed milk	1/3 pt/200 ml	249
Soya milk	1/3 pt/200 ml	25
Calcium fortified soya milk	1/3 pt/200 ml	230
Yogurt	One pot/125 g	225
Cheddar cheese	30 g/1 oz matchbox sized piece	216
Cheese spread	25 g large triangle	105
Cottage cheese	One pot/110 g	82
Tinned salmon	100 g	95
Tinned sardines/pilchards with bones	100 g	460
Bread white or brown	Two slices/72 g	72
Baked beans	200 g – A small tin	100
Tofu steamed	100 g	500

> **NOTE:** Lower fat dairy foods contain the same amount of calcium as full fat versions.

Fat plays an important role in your diet; it provides you with essential fatty acids and the fat-soluble vitamins A, D, E and K. Aim to eat small amounts of unsaturated fat (polyunsaturated and monounsaturated) but reduce the amount of saturated fat in your diet.

- Saturated fat is found in foods of animal origin such as butter, lard, full fat milk, cream and the visible fat in meat. These can cause fatty deposits to build up in your arteries so opt for leaner or unsaturated versions if possible.
- Monounsaturated fat is found in olive and rapeseed oil, nuts, seeds and avocados. Olive oil can be used in cooking or as a salad dressing and is also used to make margarine.
- Polyunsaturated fat is further broken down into omega 6 and omega 3 varieties:

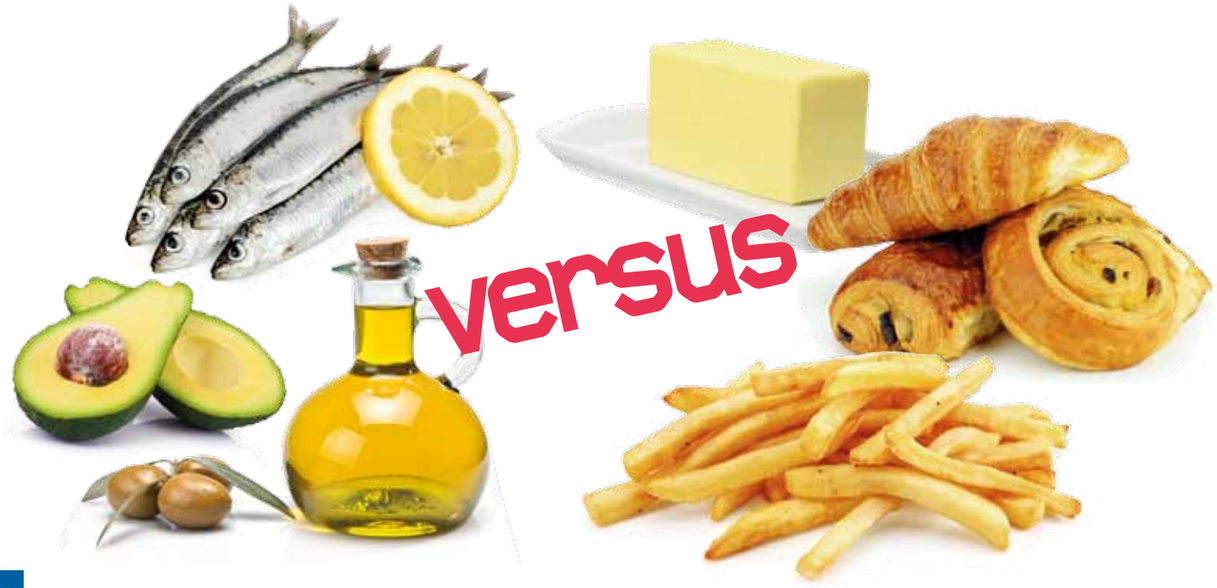
  i. Omega 6 fats (sunflower, corn and soya oils and margarines made from them) do not cause the arteries to clog up in the way that saturated fats do.

  ii. Omega 3 fats (oily fish such as sardines, pilchards, mackerel or kippers) do not produce fatty deposits in the arteries and are actually thought to protect the body from heart disease. The recommendation is that men, boys, and women past child bearing age can eat up to four portions per week of oily fish. Women of child bearing age including pregnant and breastfeeding women, and girls can eat up to two portions per week.
- Don't forget that any high fat food is also high in calories, so over-consumption will likely result in weight gain and potentially obesity, which in itself is a health risk, so keep an eye on your portion sizes.

Fluid intake is vital for health. All aspects of a healthy body rely on good hydration, from brain function to good skin. Have a variety of drinks over the day such as fruit juices, squash and tea or coffee, but including some water is always a good idea. Don't forget that you get fluid from your food too. Most people need at least 1.5-2 litres of fluid a day, plus more to cope with exercise and heat.

For those that sweat, remaining hydrated is important because it can help support optimal cooling, especially during exercise or in the heat. Be careful not to become dehydrated when performance is at stake but importantly do not drink large volumes of fluid to rehydrate if you have had gastrointestinal surgery resulting in colostomy or ileostomy, as this can cause 'dumping' (rapid emptying of the stomach) from the stoma.

Drinking adequate fluid is extremely important, along with a high fibre diet to prevent constipation, to maintain bowel function and also to help prevent urinary tract infections (UTIs).



Weight Management

Maintaining a suitable weight is important for health and weight should be neither too high nor too low. You may be concerned that a reduction in mobility and therefore energy requirements may cause unwanted weight gain. A major concern for any wheelchair user who struggles to maintain a suitable weight is the potential effect on health in terms of the risk of future development of diabetes, heart disease, joint problems, immobility and pressure sores. If you are already active in sport then there is also the added issue of the effect this may have on your performance.

DON'T...
give in to the barriers
There are potential barriers to eating healthily or exercising but if you want to lose weight these are the two key components.

DO...
combine your diet with physical activity/exercise
This will help you to achieve and maintain your weight loss goals whilst also improving your health and reducing your risk of disease.

DO...

follow a well-balanced diet

The first step towards healthy eating is choosing real, fresh and unprocessed foods and snacks but you must also keep an eye on your portion sizes. If you are a wheelchair user be realistic about your energy requirements because your needs are probably a little lower than for non-wheelchair users, even if your appetite does not change. This lower energy requirement can make reducing your energy intake harder which means that increasing your energy expenditure through physical activity becomes vital. However, you may also have to accept that weight loss may simply take a little longer than for non-wheelchair users.

DON'T...

aim for quick losses

Consider weight loss in a sensible and measured way.

DON'T...

give up

If you run into problems, talk to a friend or relative. Check whether there are any local support sessions you can attend or you could try a slimming club, but check that it operates on the basis of healthy eating. Seek help from a registered dietitian or nutritionist if needed.

WEIGHT GAIN – When ENERGY IN is more than ENERGY OUT

WEIGHT BALANCE – When ENERGY OUT is the same as ENERGY IN

WEIGHT LOSS – When ENERGY IN is less than ENERGY OUT

What Else Might Help?

- Eat routinely two to three meals per day. Try not to skip meals because this usually leads to over-compensation at the next meal.
- Nibbling between meals can add more calories to a day's food intake than you might think. Keep to low calorie drinks and snacks, with post-exercise snacks used as just that, whilst being realistic about the amount of energy you used during your session.
- Avoid putting too much on your plate. Be realistic about how much you need.
- Write a food diary to monitor your progress and find areas for improvement.
- Set goals and reward yourself when you achieve them. Try rewards such as a massage or a new item of clothing rather than calorie-laden treats like chocolate, cake or crisps.
- Weigh yourself about once a month to monitor progress. More frequent weigh-ins are not recommended due to daily fluctuations in weight.

Food Safety and Hygiene

If you travel or work abroad, or you are an athlete competing overseas, you can be exposed to a whole range of situations which could result in illness; poor food hygiene, sanitation problems, poor water quality, or inadequate hygiene standards of others in public places. No individual wants to miss their holiday, work or as an athlete, a major competition because of illness. It is therefore sensible to be aware of the risks and to take reasonable precautions to avoid problems.

Safety Tips

- Buy bottled water abroad if the tap water is suspect. (Use this to clean your teeth and your fresh fruit and veg), and avoid ice cubes.
- When taking a shower, washing your face or having a shave do not let water enter your mouth. Take care in swimming pools.
- Keep your drinks bottle clean. Use water or squash bottles that can be thrown away and replaced frequently, or sterilise your drinks bottle regularly (using a sterilising solution) to prevent contamination.
- Salads, raw vegetables and fruit can be a source of food poisoning because the food is handled and not cooked. Peel fruit rather than eating it's skin.
- High risk foods include seafood (e.g. prawns, cockles, mussels), rare meat, unpasteurised milk, soft-cooked eggs and barbequed meats, which can be undercooked in the middle.

Wheelchair Users

When propelling a wheelchair, your wheels, and therefore hands, come into contact with any number of things that may have been on the floor. Please be careful to sanitise your hands prior to eating, or touching your eyes, nose or mouth to help prevent the spread of germs. Small bottles of hand sanitiser or wet wipes are easy to carry in your pocket or bag and are useful for this purpose.

Food Hygiene

Food hygiene is very important in the home and also when travelling abroad. Always try to follow some basic guidelines:

- Wash your hands before handling food and again after sneezing, coughing or using the toilet.
- Clean surfaces and floors regularly; food waste attracts insects and vermin.
- Cover any cuts with a waterproof plaster before handling food.
- Keep track of any food that you put in the fridge. Furry, mouldy food is unacceptable and it could contaminate other food.
- Keep raw meat at the bottom of the fridge so that it cannot drip blood onto other food.
- Check 'Best Before' or 'Use By' dates. Do not eat food that is past its date. Even if food is within its date do not eat it if it looks, smells or feels off.
- Transfer any left-over canned food into a covered container to be stored.

Diarrhoea and Sickness

This is most likely to happen as a result of food poisoning or an infection that has been picked up by touching communal objects such as door handles or toilet seats. Always wash your hands well after using the toilet. Alcohol-based gels can also be used after washing to reduce the risk of contamination. If you develop diarrhoea or sickness you must be careful not to become dehydrated.

This FIT FOR LIFE guide has hopefully taught you the basics about exercise and nutrition, and about how to lead a healthy, well-balanced and active lifestyle. If you have also chosen to take up a sport and you are now taking part in exercise at least three or four times per week, you may want to download our FIT FOR SPORT guide. This will help you tailor your training, nutrition and psychological skills to ultimately improve your performance. Good luck!

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THE Coca-Cola FOUNDATION

About The Coca-Cola Foundation: Funder's of The Fit and Healthy Educational Resource

Since its inception, The Coca-Cola Foundation has awarded more than $500 million to support global sustainable community initiatives, including water stewardship, community recycling, active healthy living, and education. For more information about The Foundation, please go to **www.thecoca-colacompany.com/citizenship/foundation_coke.html**

email: phc@lboro.ac.uk

Find the online resources at: **www.lboro.ac.uk/phc-toolkit**

Useful links:

www.parasport.org.uk – Discover which sports you can play and where

www.paralympics.org.uk – Find out what's going on in the world of Paralympic sport

www.ukad.org.uk – Information on anti-doping issues for athletes

www.efds.co.uk/inclusive_fitness/ifi_gyms – Find your local accessible fitness facility

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