

# FIT FOR SPORT



A GUIDE FOR ADULTS WITH A SPINAL CORD IMPAIRMENT



Exercise



Nutrition



Psychology

If you are currently taking part in exercise or sport at least three to four times per week, this Fit for Sport guide 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, 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. **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?

**THIS SECTION IS DOWNLOADED**



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# FIT FOR SPORT



This guide has so far focused on exercising to improve your health and reduce the risk of illness. However, if you are now taking part in exercise and/or sport at least three to four times per week you may want to progress and take your sport to a more serious level. To improve your fitness and/or to achieve performance-related goals for a specific sport, your body must be challenged, or 'overloaded'. The consequence of 'overloading' your body in training is adaptation and improvements in function and fitness.

You can increase the training load placed on your body by changing one or more of the following variables:

- **INTENSITY** - faster/harder/heavier/less rest
- **DURATION** - more sets/repetitions/distance/time
- **FREQUENCY** - train more often

The load you use is essential to adaptation. If the load is too easy or remains constant for a long time then little or no adaptation will occur and performance will plateau. Therefore, when you and your coach or personal trainer design a programme you need to include a progressive, gradual increase in training load. Some people will adapt to a load quicker than others and should therefore progress faster. Others may take a little longer, so do not rush it, otherwise injury and overtraining may be waiting just around the corner.

The basis of a good programme needs to consider the following four areas:

1. Your health
2. Keeping you injury free
3. The development of base fitness work, which in turn is a prerequisite for
4. Performance enhancement work



▶ Remember that you must be fit, healthy and injury free to enable you to train and compete.





# PHYSICAL ACTIVITY AND EXERCISE



## Monitoring Training Load

It is important to understand how hard you are working and how intense an exercise session is. Pushing yourself too hard can lead to burnout and injury but if you don't work hard enough your fitness won't improve.

New technology allows you to monitor your training load. Global Positioning System (GPS) devices and downloadable 'Apps' on your mobile phone have become popular in recent years and have therefore become much more affordable. These devices often provide you with data such as distance, speed, pace, time and they often keep track of your training sessions automatically. Alternatively, try to keep a manual log of your training sessions and remember to write down the mode, duration and intensity of each session. Where possible, also record any performance times so that you can monitor your progress as well as your training load.

A common way of measuring exercise intensity is to use a heart rate monitor but if you have a SCI at or above T6 then heart rate is likely to be affected (typically found to be lower during maximal exercise). Hence, individuals with tetraplegia will usually display low heart rates during exercise. It is not uncommon to find maximal heart rates as low as 120 beats per minute (bpm), which makes the use of heart rate to monitor training intensity less suitable. If you have high-level paraplegia you may also be unable to reach your age-predicted heart rate (220 bpm minus your age in years).

It is therefore suggested that you use a simpler, yet effective way to monitor training intensity by using the Rating of Perceived Exertion (RPE) scale whereby you rate the intensity according to how you feel. Even though this may seem like an over-simplification, a number of research studies have found this scale to be very effective in terms of monitoring training in general and specifically in a population of individuals with a SCI. However, to use this method you must be realistic and honest about how hard you are working.

Using the 6-20 RPE scale, light exercise would fall in the range from 9-11, moderate exercise from 12-14, and hard exercise as anything over 15.



Figure 2. 6-20 Rating of Perceived Exertion (RPE) scale.

## Upper Respiratory Tract Infections (URTIs)

A SCI can result in a greater susceptibility to infections of the upper-respiratory tract and airways.

An impairment of exhalatory muscles (the muscles used to expel air from the lungs) may reduce your ability to cough and clear secretions from the respiratory tract and lungs, which could increase your risk of respiratory infections. The presence of respiratory infection poses an issue from a training point of view as it can lead to missed training sessions and reductions in performance. It is therefore important to reduce the likelihood of getting ill or picking up an infection in the first place. You can reduce your risk of infection by following some important guidelines:

1. Always allow for adequate recovery during periods of heavy training.
2. Avoid getting thirsty or a dry mouth as this is linked to reduced defence against coughs and colds.
3. Monitor your stress levels and factor more rest into your training schedule if you start to feel tired.
4. Reduce exposure to common infections if people around you are getting ill. Use facial tissues, wash your hands regularly and avoid contact between your hands and eyes as this is the most common way of spreading bugs.



## Different Sports Require Different Types of Fitness

Remember there is no 'Holy Grail' for a training programme. The human body is an amazing machine but we all adapt differently and at different speeds. Your programme will develop over time as you discover what works best for you. Where possible, it is always best to develop this with an experienced coaching team.

It can be useful to get some baseline data on the physical components you currently possess to enable you to evaluate your progress over time. To do this you could simply see how many exercise repetitions you can perform at a certain weight, record drill/performance/sprint times or do an aerobic test such as a timed push over a set distance.

It is also important to look at the physical demands of your chosen sport and identify any limitations/restrictions that may need to be overcome. It is essential to consider these highlighted areas when developing your programme (this is sometimes called a 'needs analysis'), as this will have a huge impact on what type of training you need to do.

Once you have answered some of these questions, you can start to plan your training by breaking it down into manageable portions to deal with specific areas at a time. The following guidelines discuss how you can train for specific fitness components. This is not exhaustive and it is important that you constantly evaluate your programme to ensure that adequate gains are being made.

The following advice and training guidelines presume that you have some good training experience under your belt and you're used to physical training. It is also important to have a good understanding of your body, how you cope with the stress of training and how your SCI affects your training. The majority of information in this section is written for sports that are more physical in nature such as Wheelchair Rugby and Basketball as opposed to sports that are more skill-based such as Shooting, Boccia or Archery. Much of this information is based on non-disabled training principles, which are easily transferred to disability sport.

Do you need a great deal of speed?

If so, what type; Initial acceleration?  
Maximum speed?

Deceleration/breaking activity?

Does your sport require agility?

If so, what types of movement?

What are your strengths and weaknesses?

Do you need a great deal of strength within your sport?



## Enhancing Endurance

Aerobic endurance describes the ability of the heart, lungs and blood vessels to deliver oxygen to the muscles and the ability of those muscles to produce energy during prolonged bouts of exercise. Anaerobic endurance on the other hand is the production of energy in the absence of oxygen during short high intensity bursts of exercise. It is important to understand what type of training you can use to produce aerobic and anaerobic fitness gains.

For some sports the best time to develop aerobic fitness is during the off-season. However, if you are competing at a good level then endurance work should continue throughout the season.

Your choice of exercise mode will depend upon availability, but should be specific to your sport or personal challenge. For example, Wheelchair Athletes should focus their training efforts on wheelchair-based exercises and Swimmers should spend the majority of their time in the pool. However, it is also important to include other forms of exercise or 'cross-training' in your programme such as a different sport, some resistance training or flexibility sessions to help reduce the likelihood of over-use injuries. Including an element of variety in your training programme will also help to keep it enjoyable and interesting.

There are three main types of cardiovascular training:

### Continuous Training...

involves performing an exercise activity without stopping for a given distance or time period (more than 8 minutes). This type of training helps to build a good base level of fitness prior to embarking on more intense types of training and will also be utilised by long-distance Racers, Swimmers and Paratriathletes to enhance their aerobic endurance.

### Varied Pace Training...

also known as 'speed play', involves exercising continuously but includes changes of pace at various intervals. This type of training therefore helps to develop both your aerobic and anaerobic endurance and is a great option for any intermittent team sport athletes where regular changes in intensity occur.

### Interval Training...

helps improve many aspects of fitness including strength, endurance and pace. Training is broken down into intervals (periods of time or distance) over which an exercise is performed; these periods of exercise are separated by rest.

Four important factors need to be considered: (a) distance to be timed, (b) distance covered, (c) number of repetitions, and (d) time between repetitions. The faster or higher intensity the exercise intervals are the more you will use your anaerobic energy system and the longer the rest intervals should be. This type of training is regularly used by sprint distance Swimmers and Wheelchair Racers.



## Training for Strength and Power

In most sports you use a multitude of strength and power characteristics and the needs analysis mentioned on page 30 will help you decide which characteristics require the most effort. In this way you can match the requirements of your sport with the appropriate type of training.

### Training for Strength

Training for maximum strength involves training with low repetitions and a heavy weight requiring you to exert as much force as possible with no time limit. A good example of this is the bench press in Powerlifting where the predominant characteristic of maximal strength enables the athlete to overcome a high force (bar and weights).

### Training for Power

Power is your ability to exert force at great speeds (or in more mathematical terms, Force x Velocity). Training for power requires you to repeatedly perform a dynamic, explosive movement with a resistance or weight.

Sprinters require both explosive power and speed to propel themselves out of the starting blocks and across the finish line. In some situations, strength becomes the dominant component e.g. the initial acceleration in a Swimming race, and in others the speed becomes the dominant component e.g. the contact time on the wheel in sprint Wheelchair Racing. Try to use resistance exercises that mimic your sporting movements to ensure direct transfer to your sport.

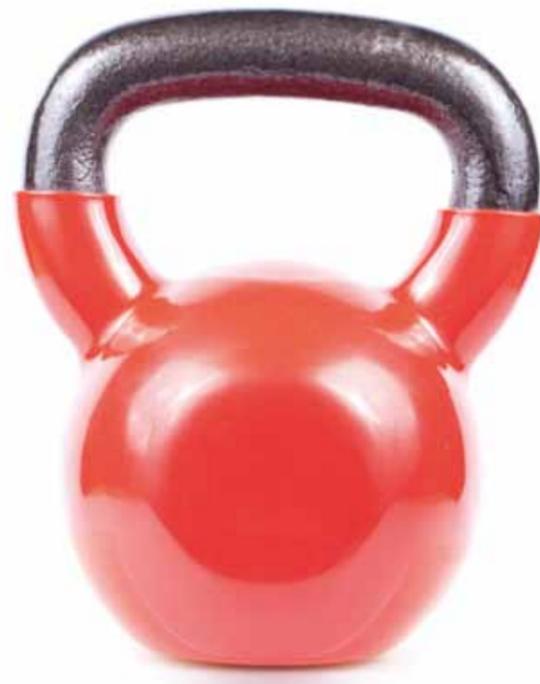
### Training for Muscular Endurance

Muscular endurance refers to the ability of a muscle/ muscle group to sustain repeated contractions against resistance over time and so this type of training is mostly applicable to more endurance-based sports.

### Training for Speed and Agility

Speed and agility can be characterised by your ability to complete movements at a fast and economical rate. To develop these skills you need to work at a high intensity for a short time, followed by a rest period, and repeat. For example, you could use a work to rest ratio of one to five; so for every high intensity speed drill you do you get five times the amount of rest that it has taken you to complete it. It is important to remember that these are high quality sessions rather than high volume so you must complete them when you feel fresh.

Agility is a combination of balance, strength and skill. In sport, agility may be demonstrated through changes in direction, changes in speed and exceptional levels of balance. Many fast athletes struggle to transfer their speed in a straight line into multi-directional movement; hence it is important to practise different movement patterns that you may be unfamiliar with. Once these movement patterns have been learned and executed well, you can increase the speed of the drill to make it more sport-specific.



## Striving for Success

If you start to train at an elite level you should be working closely with your support team to ensure that your training programme is tailored to your impairment, your sport/discipline and importantly your performance goals. At this level you are aiming to optimise training and recovery with one key goal, success. An important principle that should be applied to ensure you achieve these goals is the organisation of your training and your time in general. If you compete at an elite level and your ultimate aim is to win at a Paralympic Games, you will need to dedicate your life to that goal.

Only a select number of individuals will realise this level of sporting achievement, but if you get fit and enjoy your sport/ exercise, you will already have succeeded.



# NUTRITION

Playing sport on a regular basis does not change the basic healthy eating guidelines but you now need to place a greater emphasis on competition. It is important to develop nutritional strategies that allow you to maintain your health and well-being whilst training but also allow you to compete at your best.

✓ At this level, you should have a good idea of how much energy you need to allow you to train well. You also need to ensure your diet provides sufficient levels of all other nutrients to allow your body to recover between sessions.

✓ Remember that as your training progresses (longer, higher intensity, more frequent sessions) you will need to adjust your diet to cope with the increasing demand placed on your body.

✓ Remember that weight loss or gain could be detrimental to sporting performance. If you need any help regarding the quantity that you should be consuming, please seek the advice of a registered sports dietitian or nutritionist.

**Preparation = Planning and Practise!**



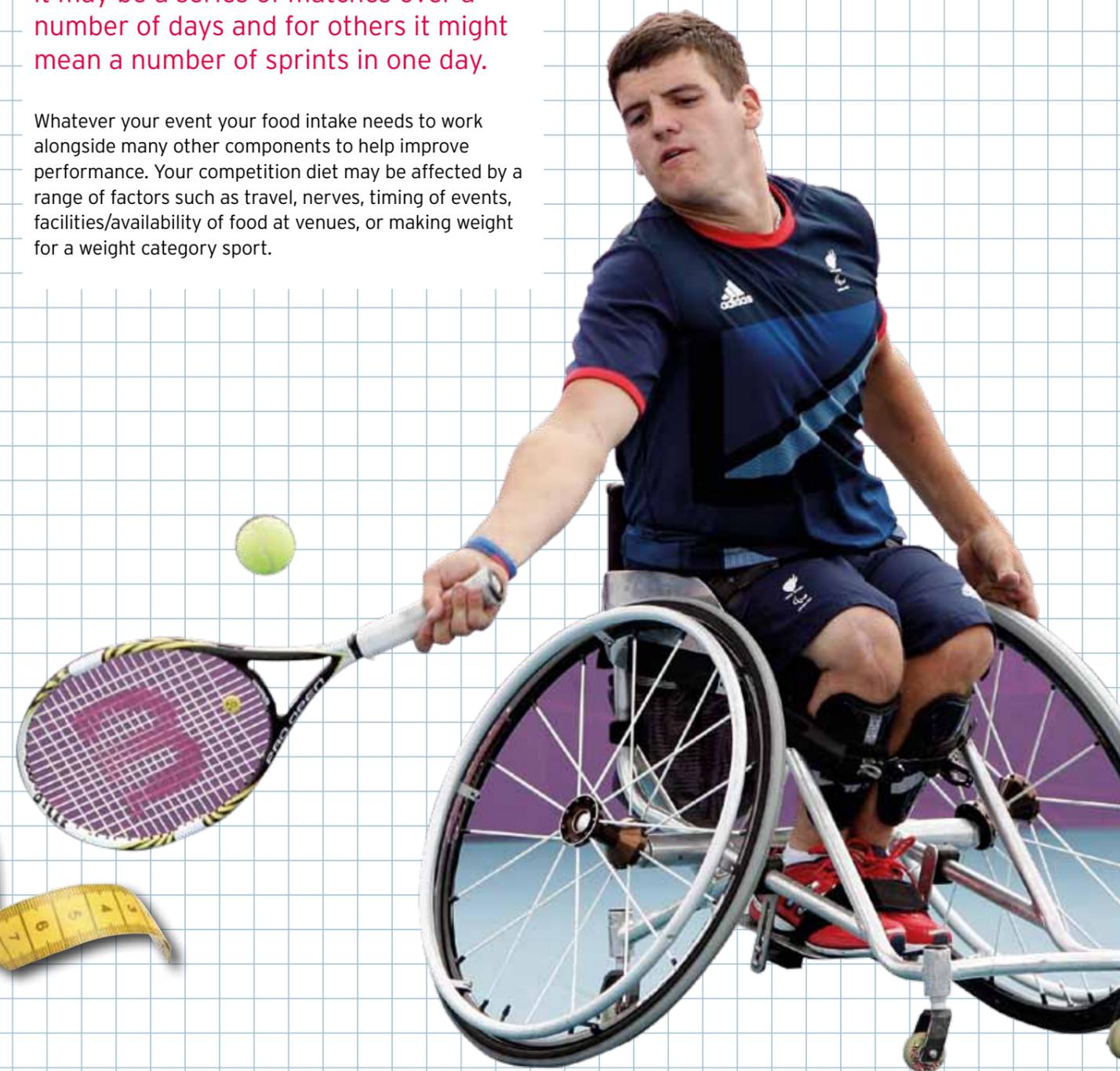
## What's Different About Competition?

Competition means different things to different people. For some it means one long event such as a marathon, for some it may be a series of matches over a number of days and for others it might mean a number of sprints in one day.

Whatever your event your food intake needs to work alongside many other components to help improve performance. Your competition diet may be affected by a range of factors such as travel, nerves, timing of events, facilities/availability of food at venues, or making weight for a weight category sport.

### Preparing for Competition

- Weeks, months and maybe even years of preparation may have gone into preparing for a competition so when it comes to the big day do not forget the final few details.





## Where to Start?

Start by thinking through the most likely scenario for your competition day. Ask yourself the following questions and maybe even write them down:

### Do you know...

- What day(s) and time(s) you are competing?
- If you have to travel, when do you arrive at the hotel/camp where you will be based?
- How many times will you need to compete to get to the winners' podium? Plan to cope with going all the way!
- If you have to compete more than once in a day or over several days, how long is the gap between events?
- What food and facilities will be available at your hotel/camp and/or at the venue?

Don't ever try anything new on competition day. Plan in advance and practise during a simulation event or training session. If things don't work at least you have a chance to change them. Make sure your kit bag contains plenty of familiar foods so that you can cope with the worst case scenario if it should happen to arise.

## Before the Event

Different events have different needs. A long distance athlete may need to load up on carbohydrates and a sprinter, whilst s/he doesn't want to start with an empty fuel tank, doesn't need to consume the same volume. Whatever your sport/event, you should start with sufficient fuel on board to match your needs. It is also important that you sip fluids little and often the day before and the morning of the event to ensure you arrive well hydrated. Check your urine against a pee chart, making sure it is a pale and straw-like colour.



## During the Event

Once you have prepared for the start, consider the competition itself. Is your sport an event where fluids and possibly foods will be needed during? Whatever drink you are going to use in the immediate lead up to or during an event should be packed with your kit. Some events have fixed time periods and others have a time scale that may vary. Plan to carry sufficient fluids and foods to cope with the longest possible time that your event may last.



## Immediately Before the Event

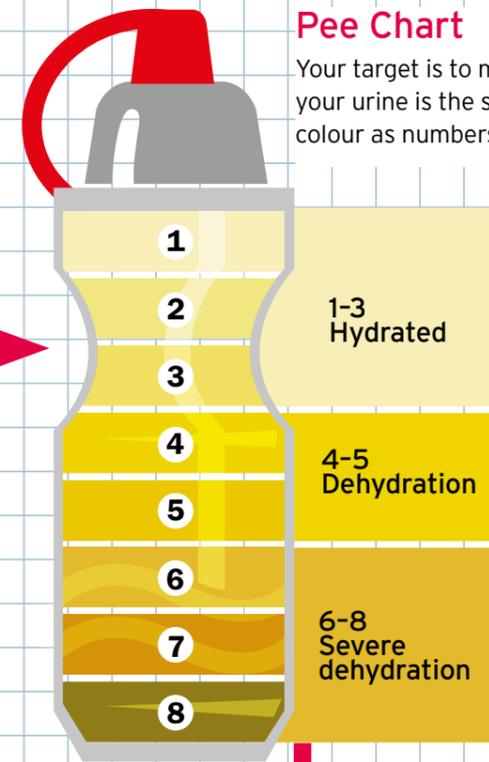
Some people find it helpful to have a small carbohydrate-based snack such as an energy bar or a piece of fruit 30-60 minutes before starting exercise. There has been some concern about this causing rebound hypoglycaemia (low blood sugar levels). The evidence suggests that there isn't a problem with athletes doing this in general but some people are more susceptible than others. Practise is the key to knowing if you are one of the few who may be affected. It is important to establish well in advance exactly what kind of snack suits you and the requirements of your sport. During the last hour before the event many athletes will also top up their fluid intake with water or a sports drink.

## Pre-competition Meal

Most people find it best to eat a meal three to four hours before competition to allow digestion time and to ensure that the energy from the meal becomes available for your body to use. Events that start early in the morning, at lunchtime or in the early evening when most people have their main meals, might mean some adjustment needs to be made to your normal eating plan. This should all be practiced in advance.

## Pee Chart

Your target is to make sure your urine is the same colour as numbers 1, 2 or 3.



## Recovery

Efficient recovery at this level is especially important for wheelchair users because you use the same muscle groups (predominantly arms, shoulders and trunk) for daily movement as you do for physical activity or exercise. Timing of nutrient intake is central to achieving efficient recovery.

Aim to consume a snack and/or drink containing carbohydrate, fluid and protein as soon as possible after a hard workout or competition. This will help your body refuel, rehydrate and repair quickly so that you are ready for your next training session or competition.

Milk products are a great recovery choice because they provide fluid, electrolytes, carbohydrate and protein all in one.

The most challenging recovery situation is when your recovery period is also the preparation period for your next event. There may not be enough time between events to allow you to eat a carbohydrate rich meal three to four hours before so use the time available to you wisely. You may be tired and want to rest but you may need to eat immediately to ensure you have sufficient energy to cope with the next round of competition. Again, this is a strategy that should be practised in advance. Some suggestions that may work include:



### 1 hour between events:

Sports drinks, squash, jelly sweets, sports gels/bars.



### 1-2 hours between events:

Sports bars, cereal bars, fruit, smoothies, jam sandwich, breakfast cereal, iced bun, plus you will need to stay hydrated. Try a sports drink to provide both fluid and carbohydrates.



### 2 hours between events:

Sandwiches, breakfast cereal, scones, scotch pancakes, malt loaf, cereal bars, jacket potato with beans, pasta and sauce, plus you can use a sports drink, squash or water to replace fluid.



### 3-4 hours:

Try to eat a well-balanced meal which is high in carbohydrate and contains some protein.

## Be Prepared

Things go wrong. Times get moved. Rain stops play. Be prepared and do not let these changes interfere with your preparation. Always travel to a competition with enough food and drink to cover every eventuality.



Table 4. Fine-tune your Competition Nutrition.

	Fluid	Food
<b>Before exercise</b>	<p>Drink upon waking and continue to sip fluids little and often to ensure you are hydrated before exercise.</p> <p>An isotonic sports drink can offer additional energy and can be useful if you struggle to consume adequate food prior to exercise.</p>	<p>A meal three to four hours before exercise should be relatively low in fat and fibre, high in carbohydrate and contain a moderate amount of protein.</p> <p>If needed, eat a high carb snack 30-60 minutes before exercise.</p>
<b>During exercise</b>	<p>Drink according to thirst to prevent dehydration (more than a body weight loss).</p> <p>For light to moderate exercise for short periods, water should be sufficient.</p> <p>Include electrolytes (sodium) for exercise in the heat or exercise that lasts more than 60 minutes.</p>	<p>For hard exercise lasting more than 60-90 minutes you can consume carbohydrate foods that provide you with a readily available source of energy. This is usually in a fluid or gel form.</p>
<b>After exercise</b>	<p>Replace ~120-150% of fluid loss (calculate by weighing yourself pre- and post-exercise).</p> <p>Include electrolytes to help retain the fluid you are drinking. This can be in a drink, snack or as part of a recovery meal.</p>	<p>After an intense or prolonged session, carbohydrate foods will help replenish the carbohydrate (glycogen) stores used during exercise. The addition of protein, especially after resistance exercise will provide amino acids for the building and repair of muscle tissue, 15-25 g is sufficient.</p>



### Bladder and Bowel Management

Everyone will have their own bladder and bowel management routine but it is important to keep up to date with technology and ensure that the systems you use are the best for you. Catheters and bags for example are continually improving and it is important to speak to a specialist nurse periodically to help you make the best decisions about bladder function, generally and specifically around training and competition. Similarly there are aspects of bowel management that a specialist nurse familiar with SCI and sport can help you with. Your bowel routine may take time, and at training camps and competitions you may have to factor this time into your preparation. You may also need to make members of staff aware how important this time is to you.



### Striving for Success

If you start competing at a high level there are also added issues to deal with such as travelling abroad for competition, eating away from home and the possible use of nutritional supplements.



## Nutrition for the Travelling Athlete

Travel might include journeys within your own country to train or compete but it might also include journeys overseas. No matter where you are going there should be a common theme; **Plan and Prepare.**

When travelling you cannot predict what food and drink will be available on the way i.e. what will be provided on a plane, whether food outlets will be open, or whether they will be accessible. Hence it is important to be prepared and where possible take your own food. Not only is this healthier but it also ensures that you will be able to meet your daily energy needs without any hassle.

Remember, both your health and performance are put at risk if you allow yourself to become dehydrated or you allow your energy stores to run low. So before your trip, make sure you find out the answers to these questions:

Are there shops nearby to buy healthy snacks?

If not, take them with you!

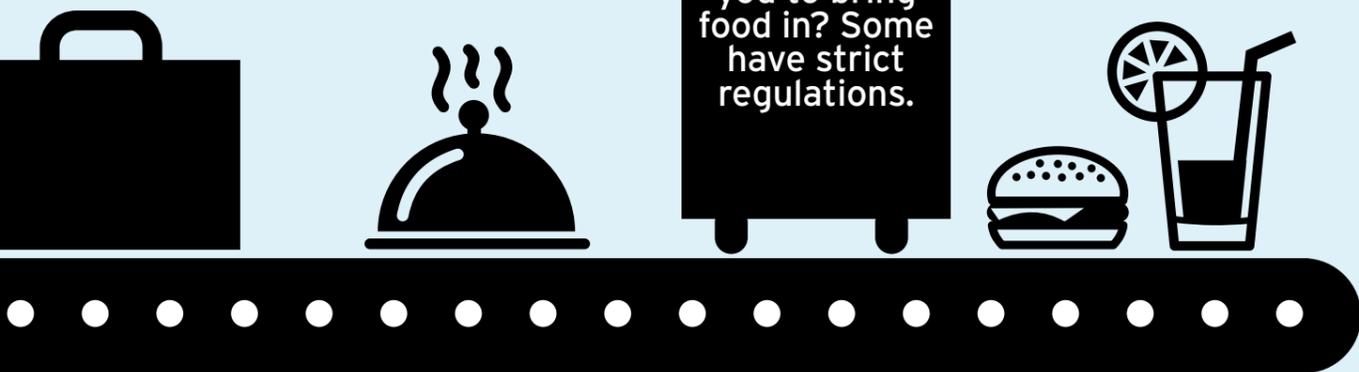
Are there foods you can't cope without? If so, take them with you!

Is your accommodation self-catered, all-inclusive or somewhere in-between?

Is the water safe to drink?

Do the meal times suit your bladder and bowel management routine?

Does the country allow you to bring food in? Some have strict regulations.



### During the Trip

- Carry food and drinks to cope with any eventuality. Remember this is nearly always healthier and usually cheaper than buying things on the way.
- Don't forget to stay hydrated.

### Travelling by Plane

- Meals on planes are very basic, they may not meet your needs and they are served at times to suit the flight, not necessarily your body clock! Carrying your own snacks means you don't need to rely on anyone else to maintain your usual food intake.
- Set your watch to the time of your destination as soon as possible and adjust your meal times accordingly.
- The availability of fluid can be limited so carry a good supply. You may have to buy drinks after clearing security.
- Don't leave your bottle in the overhead locker if you may struggle to get it during the flight.
- Avoid alcohol during the flight.



If you think food availability may be an issue then it may be useful to carry a few "emergency supplies" e.g. powdered sports, protein or meal replacement drinks, cereal bars, dried fruit, nuts, porridge and couscous.



### Bladder and Bowel management

- Some wheelchair users may find it difficult to use toilet facilities when travelling and consequently cut back on their fluid intake to reduce the need to visit the toilet. It is not recommended however, if you choose to do this, it is important that you are aware of how dehydrated you are and make sure that you rehydrate as soon as you arrive at your destination with fluids and/or electrolyte drinks.
- Use urine colour to make sure that you are fully rehydrated prior to any intense training or competition, and practise this strategy prior to travelling. Those prone to autonomic dysreflexia should take care not to drink large amounts of fluid quickly.
- If you use catheters make sure you have packed sufficient and spare for your trip and keep some in your hand luggage. Don't presume that the equipment you are used to will be available when travelling overseas.



## Supplements

### What are Supplements?

Supplements are substances which are taken as an addition or supplement to your diet. Every athlete should ensure their diet is adequate to sustain health and to maintain training, which may or may not require the use of nutritional supplements. Nutritional supplements and their effects on the performance of non-disabled athletes have been well-researched and yet the evidence of their effectiveness is limited in a disabled population.

Commonly used health supplements among people who have a SCI include cranberry extract, omega 3, vitamin C and zinc. Furthermore, those involved in sport at a high level appear to use similar types of supplements as their non-disabled athletes such as protein, recovery powders and sports drinks. The strength of evidence is mixed for many of these products and we would suggest you seek advice or search out information about a supplement prior to using it. It is recommended that you perform a personal cost-benefit analysis before deciding whether to use any nutritional supplement. Questions to ask before making your decision:

1. How strong is the evidence that it can help athletes in your sport/discipline/with your impairment? Look at scientific journals (laboratory and field based) and/or ask a registered professional sports nutritionist, dietitian, sport scientist or doctor.
2. Have the long-term benefits, issues or side-effects been investigated?
3. Is the product regularly tested for prohibited substances? See information on 'Informed Sport' on the opposite page.
4. How much does it cost?
5. Can I gain the same (and sufficient) nutrients from a whole food source?
6. Overall, do the gains/benefits outweigh the costs and possible risks of taking the supplement? Or vice versa?

### Food Supplements

Cereal bars, milkshakes and other similar snacks could be considered a supplement to the diet of the athlete. These are food products manufactured by food companies and they can form a useful part of a regular diet.

#### Sports Supplements

Includes sports drinks, protein powders, gels and glucose tablets or sweets. They are not normally associated with a risk of contamination although you should be aware that it is still a possibility and that the rule of "strict liability" makes you responsible for any substance found within your body. It is important to ensure that these products come from a reputable source. Once made up it is important that drinks are kept in a secure way to ensure that no one can tamper with them.

#### Vitamins and Minerals

It should be possible for every athlete to consume an adequate intake of vitamins and minerals by eating a well-balanced and varied diet. The simplest and safest way to ensure this is to eat at least five portions of fruit and vegetables a day. There is no evidence that extra vitamins or minerals will enhance sport performance, unless you are deficient. If minerals are needed to treat a medical condition, such as iron for anaemia, this should be done under the supervision of a sports dietitian and/or doctor.

#### Ergogenic Aids

These are substances which claim to help an athlete perform at a level higher than they would normally be able to. Included in this group would be illegal substances such as steroids, as well as non-banned substances such as glutamine or carnitine. There are very few substances which have sufficient evidence to support their use but there are a few supplements that have been shown to have a beneficial effect on performance such as creatine, caffeine and buffering agents (sodium bicarbonate, beta-alanine). If you are an athlete using any of these substances you do so at your own risk.

**As an individual who has a SCI you may need to consider adjusting the dosage of a supplement to suit your needs, which often means reducing the recommended non-disabled dose. Logically this would mean adjusting the dosage according to the amount of active muscle mass you have. Unfortunately the evidence for exactly how much and how often you should consume different supplements as an individual with a SCI is limited so please consult a registered nutritionist or dietitian for advice.**

If you are an athlete eligible for testing please ensure you visit [www.informedsport.com](http://www.informedsport.com) to check the safety of each product. For more information visit the UK Anti-Doping website: [www.ukad.org.uk/athletes/performance/supplements](http://www.ukad.org.uk/athletes/performance/supplements)





# SPORT PSYCHOLOGY:

## Core Skills for Performance

The world of sport psychology is dedicated to helping athletes achieve the mental strength needed for successful sporting performance. Having the right mental approach to your sporting life can help you fulfil your expectations.



## Goal-Setting

Goal-setting is the process of establishing a target to be met within a given time period. Goals can keep you motivated and interested even when the going gets tough. A mass of scientific research has shown that setting goals works. It makes us try harder, perform better and ultimately achieve more. It also boosts our confidence as we build up our own sporting history.

### What Motivates You?

The best goals are those that you find motivating. Some people are results focused; they are motivated by achieving an outcome such as a particular result or selection to a squad. Others are more performance focused; they are motivated by obtaining a sense of achievement based on the quality of their own performance such as a personal best. Given this information, there are three main types of goal:

- **Outcome Goals:** these goals refer to the results you want to achieve (to win or be selected for the team).
- **Performance Goals:** these are also results based but they are less influenced by others (your race time or percentage of first-serve in).
- **Process Goals:** these goals refer to the skills and techniques you will need to gain in order to achieve your outcome goals.

Although it is important to set a balance of outcome, performance and process goals, you should keep in mind that process goals are less likely to lead to unnecessary pressure. Process goals are also in your control (e.g. doing your best) whereas outcome goals (e.g. winning gold) are not 100% in your control.

### Setting Effective Goals

Effective goal-setting is not an easy task. It is a skill that develops with experience. The process needs to be done in collaboration with your coach and other key people. Most importantly however, you need to feel that the goals are acceptable to you.

## SMART(ER) Goals

**Specific** - goals should be as specific as possible to help focus your attention.

**Measurable** - to enable you to assess your progress against a baseline or standard.

**Accepted** - by you, your coach(es) and other key support staff.

**Realistic** - your goals should be challenging but within your capability or potential.

**Time-based** - you should have a clear time frame and deadline for your goal(s).

**Exciting** - your goals should be inspiring and rewarding to you.

**Recorded** - your goals should be written down by you, your coach and others to evaluate progress, provide feedback and provide motivation.

## Short- and Long-Term Goals

You should set one or two long-term goals and several short-term goals. Your long-term goals should be your ultimate aim, for example completing a 5 km or 10 km race, winning a medal in your chosen sport or even Paralympic qualification. Your short-term goals work as a series of steps that build towards your ultimate aim. Short-term goals might include improving technique, slowly increasing your training load or competing in key practise events. The idea of this bite-size approach is that it makes your dream, long-term goal less daunting and more achievable.





## The '4 Cs'

The '4 Cs' have been identified as being the basic psychological skills that can help you get the best out of yourself in training and competition:

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### 1 Concentration

- your ability to maintain focus.

### 2 Confidence

- the belief you have in your ability to perform at your desired level.

### 3 Control

- your ability to maintain emotional control regardless of any distractions you might encounter.

### 4 Commitment

- your ability to continue working hard to achieve your agreed goals, particularly during 'the tough times'.

1

1

## Concentration

The ability to focus on the right thing, at the right time while under pressure is a central part of sporting performance. You have probably been told to focus or concentrate by your coach or indeed by yourself but focus on what?

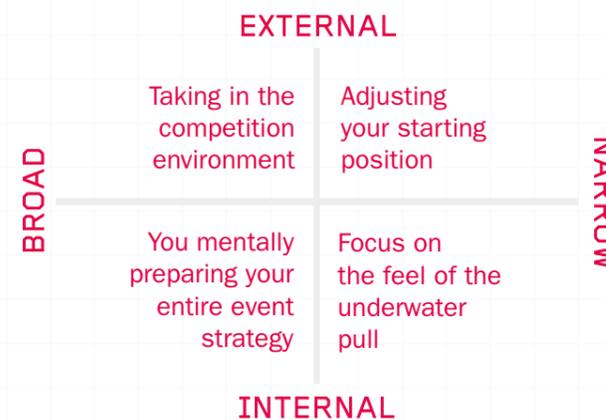
Effective concentration is all about knowing exactly what you need to focus on.

During training you need to focus on your process goals (i.e. techniques, skills). During competition you need to focus on how you, with your coach, have decided you are going to approach the event. By doing this you select the most important aspects of your performance on which to concentrate. To help you clarify how to concentrate more effectively on your goals, look at the two dimensions of attention and see which one, or combination fits your own sporting needs best.

**Dimension 1: Width (broad-narrow)** This refers to how many things you are paying attention to at any one time. When your attention is broad you are paying attention to many things. When you have a narrow attentional focus you are usually concentrating on one thing or at most two to three things at once. For example, team sports such as Wheelchair Basketball demand a broad attentional focus, whereas Archery or Shooting require narrow concentration.

**Dimension 2: Direction (internal-external)** This is defined by whether your attention is focused internally on your own thoughts, feelings and behaviour (performance) or externally toward the events in the training or competition environment.

The graphic below presents the two dimensions of attentional style using an example from Swimming.



Once you know the type of concentration style your sport requires (it may change to suit different situations within a match/competition), you need to identify the level of intensity you require.

- Sustained concentration is used in sports like distance Running and Hand Cycling.
- Short bursts of concentration are used in sports like Shooting, Archery and field events in Athletics.
- Intense concentration is used in sprinting events such as Wheelchair Racing and Alpine Skiing.

Distraction can significantly undermine your ability to concentrate, effectively resulting in poor performances and 'below par' results. Examples of common distractions include:

- Anxiety, focusing on mistakes
- Fatigue
- Weather
- Equipment problems/failure
- Difficulties in key relationships (e.g. coach, teammate, family)
- Media
- Your opponent
- Negative thoughts

Therefore, distraction management is an important set of skills that can be learnt. Distraction management typically involves you thinking and behaving in ways that you know help you to remain positively focused. These skills include focusing on your process (technique-based) and performance (results-based) goals and identifying specific 'trigger words' that remind you to concentrate on your performance and not the outcome. Focusing and refocusing can be a very useful tool. Refocusing is necessary when something has distracted you and you are at risk of letting the quality of your performance drop because of it. Here is a routine that you can use to help you refocus:

1. **React** - take a moment to release the build-up of emotional tension. This could include silently saying 'let it go' to yourself; then
2. **Relax** - take a moment to calm down by taking a deep breath in and simultaneously tense your upper body muscles then 'let go' and release the tension as you breathe out.
3. **Reflect** - decide what action you need to take to improve your next point, lap or whatever you are doing in the next couple of minutes.
4. **Refocus** - get yourself ready to put into practise what you have decided to do. A trigger word such as 'drive' or 'smooth' can help switch your focus.



2

## Confidence

Confidence is something you know you have or you know you don't. What is more difficult to know is how to gain or regain it. Confidence is the feeling you get that lets you know you can achieve the level of performance you desire. Goal setting and imagery are two effective techniques used to improve confidence.

### Imagery

Sometimes referred to as "visualisation" or "mental practise", imagery is the process of imagining a performance in your mind's eye. You might see yourself preparing at the start line of a race or alternatively you might visualise scoring a goal and hearing your teammates cheer. It can be a really powerful tool and is something most of us already have some experience of (e.g. mentally planning how a meeting with your boss will go so that you feel prepared and relaxed when you actually have the meeting). As well as enhancing confidence, imagery can increase focus and improve relaxation. It can also help you maintain your technique when you are injured by allowing you to mentally rehearse your performance.

Imagery can be used at any time because it requires little, if any equipment. You might visualise your performance while travelling to the event or in the changing room right before. Similarly, in the build-up to the event use "dead time" as an imagery opportunity. When you have more time, you may benefit from performing more carefully planned, structured imagery. This technique can be really helpful but accurate, detailed imagery is a skill and takes plenty of practise.

Good imagery is vivid and detailed so try to incorporate a variety of senses to bring the process to life (e.g. the smell of the pool, the sound of the ball bouncing or the feel of the ice). It is a lot to think about so sport psychologists often advise creating what is called an "imagery script" that provides all the necessary details. This can be audio recorded and played back to guide your imagery. Finally, think positively. Visualising everything going wrong will wreak havoc with your confidence. That said, visualising how you will deal with setbacks can be a useful strategy but this needs to be done well in advance, not the night before or the morning of your competition.

## Control

Maintaining control of your thoughts and feelings and being able to remain focused on your performance goals under pressure is important. One of the most used phrases in sport is to focus on 'controlling the controllables'. Focus on managing the situations that you have some influence over; how you think, feel and behave (perform). You have moderate influence over others and very little influence over the environment within which you're training or competing.

Ideally you need to focus most of your energy and coping resources on the areas that you have the greatest influence; yourself! To do this you need to have a good understanding of how you react to pressure (your thoughts, feelings and behaviour) and you need to identify which situations (types of relationships, circumstances during competition) 'rub you up the wrong way'. This includes developing the ability to consciously identify what you're thinking and feeling, and why. Learning about how you react to these situations will help you develop helpful coping strategies to reduce any negative effects on your performance.

There are two main emotions that typically pose the greatest challenge to maintaining focus that you may need to manage: anxiety and anger/frustration.

3

**Anxiety** is an emotion associated with numerous side-effects. If you are anxious you may experience nausea, a racing heart, sweating or muscle tension. You may also feel preoccupied, distracted or find it difficult to sleep. Anxiety often occurs when our performance is really important to us, for instance at a National Championships. Interpreting anxiety as a positive indication of how important this event is to you will help make your anxiety work for you. Is your thinking focused on you having a good or bad performance? The previously highlighted skills of goal-setting and visualisation can help you challenge unhelpful thoughts. Effective goal-setting should give you the self-confidence to tackle tough situations and you can visualise how you will overcome the cause of your anxiety. Relaxation techniques can also be helpful to reduce the level of anxiety and help you to focus on succeeding. See Relaxation Techniques on page 50.

**Anger/frustration** can distract you at critical times during your performance. You generally experience this emotion when you think that something unfair has happened to you. Anger/frustration are closely associated with blame. Some athletes will blame themselves: 'I knew this would happen and I should have done something about it'. Others will blame people, situations or things around them; 'the referee is a fool' or 'the organisation of the tournament was awful'.

Anger/frustration will generally serve to distract you from your stated game plan. It is important to acknowledge your feelings and then encourage yourself to re-focus on the task in hand. It can be useful to call on the refocusing routine highlighted earlier. The quicker you move on, the quicker you can get back to competing at your best.

## Commitment

Many athletes have talent. Many will put in some of the required time to develop their talent. Only a few will 'do what it takes' to get to the top. Is this you?! Your level of commitment will shape whether or not you reach your true sporting potential. "Winning a gold medal takes living a gold medal, it's a lifestyle, which must be present every conscious moment" Randy Snow (2000). It's useful to regularly reflect on your commitment. Below are some warning signs that if left unmanaged can weaken your commitment:

- You perceive that there is a lack of progress or improvement in your performance.
- You feel that you aren't sufficiently involved in the development of your programme.
- You feel that you don't fully understand or agree with the objectives of your programme.
- You experience injury or delays in rehabilitation from injury.
- You feel a lack of enjoyment.
- You experience unhelpful anxiety about competition.
- You are becoming bored with your sporting life.
- You feel that your coach and/or support staff are not working as a team.
- You feel that there is a lack of commitment, as you see it, by other team members, your coach or support staff.

If you become aware of anything affecting your performance you need to act promptly and find ways to resolve the challenges you have identified, otherwise your commitment to your goals may suffer.

4





'BREATHE SLOWLY'

'STAY STRONG'

## Striving for Success

In addition to the C's there are other techniques that are often applied by athletes.

### Relaxation Techniques

Relaxation is an important part of preparing to perform. The body needs time to recover from the physical and mental stresses it has been subjected to, especially during stressful or high pressure periods. Regular use of relaxation techniques has become a popular and valuable performance strategy.

There are two main categories of relaxation techniques; those which target physiological (physical) tensions and those which provide a cognitive (mental) focus. Both categories of technique can often help with physical and mental relaxation; a relaxed mind often leads to a relaxed body and vice-versa.

### Preparing to Relax

As with any new skill, relaxation techniques need to be learned and practised to be effective. When using a new method give yourself a chance to perform it successfully and prepare the environment by removing any distractions or potential stressors. Once you've practised and become successful in a calm environment, with time it should be possible to transfer the skill to other situations.

Relaxation should initially be practised in a warm (but not hot or stuffy) room, which is quiet and has low levels of lighting. Prevent potential interruptions by switching off your phone or putting a 'do not disturb' sign on the door. Clothing should be loose and comfortable. The body should be well-supported using pillows or cushioning as required. Music can be used successfully, particularly using personal headsets but volume should be low and tunes should be calming. Try to assign some time each day specifically for relaxation.

### Progressive Muscular Relaxation

This physical technique involves the tensing or medium contraction of large groups of muscles followed by release or relaxation of the same muscles. Different muscle groups are worked in sequence, often progressing up the body but may be performed in reverse, or in part. For individuals who have a SCI these routines can easily be adapted to suit your needs. Often an athlete will listen to a verbal recording of key cues that guide them through the relaxation process. An outline of the cues for this technique is as follows:

1. Tuck your stomach in and hold for 4-5 seconds then relax for 4-5 seconds. This may be repeated two to three times if desired. Remember to breathe in as you tense each muscle group, briefly hold that breath and then slowly breathe out as you relax.
2. Now follow step 1 with the muscle groups below using similar contraction and relaxation times.
3. Clench your fists and tense your biceps and triceps, and relax.
4. Brace or shrug your shoulders, and relax.
5. Push your head back into your pillow/support, and relax.
6. Clench your teeth, and relax.
7. Frown or furrow your brow, and relax.

#### Advantages:

- This is a simple technique which you can use by yourself.
- It can easily be performed at an event.

#### Disadvantages:

- Some athletes find it difficult to let go of the tension and prefer to just focus on the relaxing element of the technique.

Remember that even if you are not able to tense and relax a specific muscle group, concentrating on that area and focusing on good, slow breathing can help you feel emotionally calmer even though there might be little or no actual physical changes in your muscles. Imagining a pleasant and calm place can also help you relax.

**TOP TIP** Borrow CDs from the local library or listen to samples online to see if you like the technique and the narrator's voice before you buy your own version.

### Massage

Massage can also be used as a valuable form of relaxation, however as it requires another person it should not be your only method. You should make sure that you are able to relax by yourself without any help anywhere in the world. It is important to note that relaxation massages are different to remedial or sports massages. You might need sports massage as part of your training programme but this type of massage is unlikely to be relaxing.

### Positive Distractions, or "Switching Off"

Relaxation can be as simple as doing something that you find relaxing such as listening to music, reading a book, watching a movie or spending time with family or friends. Pay attention to what helps you switch off and relax when you need to recover and plan these activities for times when you know you may need to make a special effort to relax.



'Believe'

'Keep going'

### Self-Talk

Unsurprisingly self-talk concerns all the talking we do to ourselves either out loud or internally when we think. Many of us do it naturally but sport psychologists have shown that it can have a big impact on how we feel and how we behave. As such it is important to keep our self-talk positive as this will lead to positive feelings and behaviours. Alternatively, shouting "you're hopeless" after a particularly tough training session won't do you any favours an obvious point but many people do it! Self-talk is usually divided into two main categories: motivational ('keep going') and instructional ('speed up').

Positive self-talk can be an important skill to call upon when you are struggling for motivation or lacking confidence. You might use simple words or phrases that remind you of a previous success or your motivations for taking part such as '**BELIEVE**' or '**STAY STRONG**'. It is important that the words you choose mean something to you and can be associated with your own positive experiences. Factors such as nervousness and tiredness can result in a dip in technical performance and when our energy is focused on just getting through we can easily forget about our technique. For example, in events like Running, Hand Cycling and Swimming, controlled and rhythmic breathing is very important but can easily be ignored in the heat of the action. Instructional self-talk such as '**BREATHE SLOWLY**' or '**CONTROL YOUR BREATHING**' can help to regain the technical focus necessary in such a situation.

The biggest problem can be keeping this talk positive. Sport psychologists often use 'thought stopping' to help athletes with this. Thought stopping uses trigger words or actions to stop negative thoughts in their tracks. As soon as you become aware that your self-talk is unhelpful you counteract this by saying words such as '**POSITIVE**' or '**STRENGTH**' and then immediately focus on something positive and goal-related. You can even try using a physical trigger to break the negative thought cycle such as a single hand clap or a fist clench.



## Pre-Competition Plan

This refers to a sequence of preparatory steps, conducted in order, in the build-up to an event. At the elite level pre-performance routines are often elaborate and should always be well practised. They allow athletes to focus on the upcoming competition and provide a sense of control that can be calming. By knowing exactly what you should be doing and when, you remove many potentially stressful decisions from your day.

When to start your routine will depend on your competitive level. If you are a Paralympian it may begin one or two weeks before you are scheduled to perform but the pre-performance routine becomes particularly important the night before an event. It is often useful to have a set time to be in bed to avoid getting distracted, plan when you will wake up, know what you will eat for breakfast (take it with you if necessary), be sure of your route to the venue and have an alternative planned in case of unforeseen circumstances. There are many other simple steps like these that may seem trivial but will help to ensure that everything runs smoothly. Always be prepared to adjust your routine as things beyond your control may happen.

Aristotle once said,  
 “We are what we repeatedly  
 do. Excellence, then, is not  
 an act, but a habit.”

Consider the following structure to help you develop new routines as well as refine existing ones. This structure is based on the scenario of you travelling abroad to a major competition.

- Establish a time-line. Identify the date of your event(s) and work backwards to identify how much time you ideally need to allocate to each phase of training/preparation.
- Draw up a list of the kit that you need to take with you. Include your sport-specific kit as well as anything else you need to help you manage your down-time or make you feel more comfortable. Take time to pack your kit checking it against your list.
- The journey out: Consider what your usual reaction to travel is including the effort involved during the flight, train or car journey and any adjustments to time difference. Build meal times into your journey and plan what you will take/where you will buy it and include recovery time into your schedule upon arrival.
- Set up a ‘home away from home’. Allow time upon arrival to set up your immediate environment so it is as familiar as possible. Bring a few personal items with you and take time to get to know your environment including the sporting and general facilities.
- Training preparation: Use this time to fine-tune and practise the important skills that you identified prior to leaving home. As well as physically practising activities you can also mentally rehearse these skills. In this way you are preparing yourself psychologically and physically to deliver your desired performance.
- Post-event routines: Consider what you are going to do immediately post-event after you have met any official protocols by the organisers or the media. Decide when and how you are going to evaluate the event. Review and appraise your performance in terms of your pre-event goals. Identify lessons learned and how you are going to adapt to accommodate these changes in your subsequent training and competition routines.

## Practise to Excel

Psychological skills, like all skills, require practise to learn and execute, especially under pressure. The more you practise, the more proficient you get, and the more useful the psychological skills become. It is always sensible to practise in events that may not be as important to you. Serious athletes who are considering integrating a full mental skills programme into their training regime should consult a sport psychologist for advice and support. If you are not a competitive person, you can simply pick and choose any practical, common sense suggestions that you find useful.

Always keep in mind that you will have developed many important psychological skills without realising. A number of experts believe that as a disabled person you have already overcome a variety of life challenges and you are often well prepared for whatever sport has to offer. This is known as the ‘growth through adversity’ hypothesis and it suggests that disabled people enter the sporting world mentally strong. The tips in this guide may supplement your existing mental strength and help you on your way to achieving whatever goals you set for yourself.

## Summary

Overall, while detailed and specific evidence for exercise and nutrition for people who have a SCI is scarce the most important thing is to understand your own body. Listen to how it feels after a workout, recognise how long it takes to recover from a hard session, understand the effects your medication can have, learn how long it takes to digest a meal and what foods you can eat before, during and after exercise, and how to cope with winning and losing. Once you can do this, you will be on your way to achieving your personal goals.



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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](http://www.thecoca-colacompany.com/citizenship/foundation_coke.html)

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If you are new to exercise, newly injured/impaired or have any secondary medical conditions, or you are unsure about the content of any of the information within the Toolkit we recommend that you consult a qualified medical professional such as your physician, before engaging in new types or intensities of activity. Remember it is important to start with small amounts of exercise and progress slowly.

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email: [phc@lboro.ac.uk](mailto:phc@lboro.ac.uk)

Find the online resources at: [www.lboro.ac.uk/phc-toolkit](http://www.lboro.ac.uk/phc-toolkit)

Useful links:

[www.parasport.org.uk](http://www.parasport.org.uk) - Discover which sports you can play and where

[www.paralympics.org.uk](http://www.paralympics.org.uk) - Find out what's going on in the world of Paralympic sport

[www.ukad.org.uk](http://www.ukad.org.uk) - Information on anti-doping issues for athletes

[www.efds.co.uk/inclusive\\_fitness/ifi\\_gyms](http://www.efds.co.uk/inclusive_fitness/ifi_gyms) - Find your local accessible fitness facility

