



**Wick Academy Football Club  
Harmsworth Park Wick  
Sports Science Guidance**



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## 1. Sports Science Introduction

This document sets out basic advice and guidance for Wick Academy Football Club players and coaches regarding Sports Science. This is a very complex area and this document has been produced to only give broad advice and guidance. Specialist Sports Science or medical advice should always be sought for any further information that may be required, or to answer any specific queries resulting from this document.

## 2. Diet and Nutrition

Nutrition can play a pivotal role in supporting the training and competition demands of any elite footballer.

Food alone will not make you pass the ball faster or knock seconds off your personal best, but the right diet is absolutely central in supporting training to make those achievements possible.



Good food choices help ensure fuel needs are met to promote adaptations to training, to aid recovery in order to continue and intensify training and to ensure good health to prevent illness and injury.

What a footballer consumes before, during and after a game is important for comfort and performance during the game. While eating soon before a game doesn't provide the bulk of the fuel needed for the activity, it can prevent the distracting symptoms of hunger during it. The major source of fuel for active muscles is carbohydrate which gets stored in the muscles as glycogen in the days before the match. This is one reason that the post-game meal is critical to recovery and being ready for the next match.

### When To Eat

Exercising on a full stomach is not ideal. Food that remains in your stomach during an event may cause stomach upset, nausea, and cramping. To make sure you have enough energy, yet reduce stomach discomfort, you should allow a meal to fully digest before the start of the event. This generally takes 1 to 4 hours, depending upon

what and how much you've eaten. Everyone is a bit different, and you should experiment prior to training sessions to determine what works best for you.

If you have an early morning game or training session, it's best to get up early enough to eat your pre-exercise meal. If not, you should try to eat or drink something easily digestible about 20 to 30 minutes before the event. The closer you are to the time of your event, the less you should eat. You can have a liquid meal closer to your event than a solid meal because your stomach digests liquids faster.

## **What To Eat**

Because glucose is the preferred energy source for most exercise, a pre-exercise meal should include foods that are high in carbohydrates and easy to digest. This includes foods such as pasta, fruits, breads, energy bars and drinks.

## **Planning**

Planning is essential if you are competing in an all-day event, such as a tournament. Consider the time of your event, the amount of your meal and the energy required. Also, be aware of the amount of fluid you consume. You should plan ahead and prepare meals and snacks that you have tried before and know will sit well with you. Do not experiment with something new on the event day.

## **Suggested Pre-Training Foods**

Eating before training is something only the footballer can determine based upon experience, but some general guidelines include eating a solid meal 4 hours before exercise, a snack or a high carbohydrate energy drink 2 to 3 hours before exercise, and fluid replacement (sports drink) 1 hour before exercise.

### **1 hour or less before competition**

- Fruit or vegetable juice such as orange, tomato, or V-8, and/or
- Fresh fruit such as apples, watermelon, peaches, grapes, or oranges and/or
- Energy gels
- Up to 1 1/2 cups of a sports drink.

### **2 to 3 hours before competition**

- Fresh fruit
- Fruit or vegetable juices
- Bread, bagels
- Low-fat yogurt
- Sports drink.

### **3 to 4 hours before competition**

- Fresh fruit
- Fruit or vegetable juices
- Bread, bagels
- Pasta with tomato sauce
- Baked potatoes
- Energy bar
- Cereal with low-fat milk
- Low-fat yogurt
- Toast/bread with limited peanut butter, lean meat, or low-fat cheese
- 30 oz of a sports drink.

### **Sugar and Performance**

If you are an endurance athlete, evidence suggests that eating some sugar (like energy bars, some types of candy bars, or sports drinks) 35 to 40 minutes before an event may provide energy (glucose) to your exercising muscles when your other energy stores have dropped to low levels. However, you should experiment with such strategies before competition because some people do not perform well after a blood glucose spike.

### **Caffeine and Performance**

Caffeine (tea and coffee) acts as a stimulant on the central nervous system. It had been thought to boost endurance by stimulating a greater use of fat for energy, and thereby reserving glycogen in the muscles. Research, however, doesn't support that theory. When caffeine improves endurance, it does so by acting as a stimulant.

Caffeine can have serious side effects for some people. Those who are very sensitive to its effects may experience nausea, muscle tremors, and headaches. Too much caffeine is a diuretic, and can result in dehydration, which decreases performance.

### **Foods to Avoid Before Exercise**

Any foods with a lot of fat can be very difficult and slow to digest and remain in the stomach a long time. They also will pull blood into the stomach to aid in digestion, which can cause cramping and discomfort. Meats, doughnuts, fries, crisps, and sweeties should be avoided in a pre-exercise meal.

Keep in mind that everyone is a bit different and what works for you may not work for you teammate or training partner. Factor in individual preferences and favourite foods, and an eating plan is a highly individualize thing.

### **Eating After Exercise**

It is also important to consume carbohydrate, such as fruit or juice within 15 minutes post-exercise to help restore glycogen - your muscles' energy store.

Research has shown that eating 100-200 grams of carbohydrate (such as pasta) within two hours of heavy training is essential to building adequate glycogen stores for the next session. Waiting longer than two hours to eat results in 50 percent less glycogen stored in the muscle. The reason for this is that carbohydrate consumption stimulates insulin production, which aids the production of muscle glycogen.

### **Carbohydrate Plus Protein Speeds Recovery**

Research shows that combining protein with carbohydrate in the two hours after exercise nearly doubles the insulin response, which results in more stored glycogen. The optimal carbohydrate to protein ratio for this effect is 4:1 (four grams of carbohydrate for every one gram of protein). Eating more protein than that, however, has a negative impact because it slows rehydration and glycogen replenishment.

### **Protein Needs After Training**

Consuming protein has other important uses after exercise. Protein provides the amino acids necessary to rebuild muscle tissue that is damaged during intense, prolonged exercise. It can also increase the absorption of water from the intestines and improve muscle hydration. The amino acids in protein can also stimulate the immune system, making you more resistant to colds and other infections.

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## **3. Flexibility**

Flexibility refers to the ability to move joints through their entire range of motion, from a flexed (bent) to an extended (straight) position. The flexibility of a joint depends on many factors including the length and suppleness of the muscles and ligaments and the shape of the bones and cartilage that form the joint. Flexibility can be genetic, but it can also be developed by stretching.

Flexibility is an important component of fitness and exercise tends to increase the amount of flexibility in a joint. Flexibility is also specific to the type of movement needed for a sport so it is more important for some sports than others. Cyclists, for example, require less hip flexibility than hurdles, and swimmers need more shoulder flexibility than runners.

### **Can You Increase Flexibility?**

Improving flexibility is done mainly by performing stretching exercises. The most common forms of stretching exercises are static, sustained stretching exercises that are slow and controlled. Static stretches are thought to be safe for most people. They

involve a slow, gentle stretch of the muscle that is held in a lengthened position for 10 to 60 seconds and repeated about three times.

Another type of stretching exercise is called dynamic stretching. Dynamic stretching involves gradual increases in your range of motion and speed of movement with a controlled swing (not bounce) that reach the limits of your range of motion in a controlled manner. You never force this type of stretch. Examples of dynamic stretching are slow, controlled leg swings, arm swings, or torso twists.

Dynamic stretching exercises improve flexibility required in most sports and are often performed after a warm up before aerobic exercise training. Dynamic stretching exercises includes 10 to 12 repetitions of the movement.

### **How to Increase Flexibility**

Before stretching, it's important to warm up the muscles and joints. Stretching cold, tight muscles can lead to injury, so perform some gentle joint rotation exercises and an easy aerobic exercise first. Joint rotations are done by using small, slow circles (clockwise and counter-clockwise) at every joint until they all move smoothly and easily. You can also do some marching or even jumping jacks to raise your core temperature and increase your circulation before you stretch.

For a stretch exercise to improve flexibility, it needs target the specific joint and provide enough stretch to the muscles and ligaments over time to allow an adaptation to a new, increased, range of motion. Basically, what this means is that when you stretch, you need to feel the tightness and slight burning sensation that comes from going slightly beyond your normal range of motion. By doing so, you will develop a new range of motion over time. It is important to avoid over-stretching the muscles and causing an injury or muscle strain. The recommendation is to stretch to the point of mild discomfort but not to the point of pain.

To develop long-term improvements in flexibility, stretch every other day for at least six weeks. Keep in mind that when you stop using or stretching this new flexibility, you are likely to lose the gains you made.

### **The Benefits of Flexibility**

As a footballer, keep in mind that overall flexibility is less important than having the right flexibility for football. Having more flexibility doesn't necessarily mean fewer injuries and an athlete with poor flexibility isn't more likely to get injured. The key is to have the right flexibility for your sport, so you can easily move through the range of motion without straining muscles.

In fact, research also supports the idea that performing a proper warm up before exercise is far more likely to help reduce injuries. Warm up by lightly exercising the major muscle groups to be used in football. Your coach will help you with this area. You can also warm up with marching, arm circles, or starting at a very slow pace.

## **Flexibility and Strength Training**

If you lift weights, it's every more important that you stretch, and the best time to stretch is right after a workout. Static stretching of fatigued muscles can increase flexibility and improve muscle building. Static stretching helps loosen muscles, removes lactic acid and prevent the muscle tissues from healing at a shorter length after a heavy workout.

### **Can You Be Too Flexible?**

It is possible for the muscles and ligaments around a joint to become too flexible. Extreme flexibility may be due to loose ligaments and muscles which may offer less joint support and may even increase the risk of injuries such as joint dislocations. Excessive flexibility can be just as bad as not enough.

### **Proper Stretching Technique**

- *Perform balanced stretching.* This means you should always stretch the muscles on both sides of your body evenly. Don't stretch one side more than the other side.
- *Avoid over-stretching.* Never stretch to the point of pain or discomfort. You will feel slight tension or a pull on the muscle at the peak of the stretch.
- *Go slow!* Always stretch slowly and evenly. Hold the stretch for about fifteen seconds and release slowly as well.
- *Never bounce or jerk while stretching.* This can cause injury as a muscle is pushed beyond its ability. All stretches should be smooth, and slow.
- *Don't forget to breathe.* Flexibility exercises should be relaxing. Deep easy, even breathing is key to relaxation. Never hold your breath while you stretch.

### **Recommended Stretches**

#### **Hamstrings**

Sit on the floor with one leg straight in front of you and the other leg bent (with the sole of the foot touching the inside thigh of the outstretched leg). Keep your back straight and lean forward from the hips. Slide your arms forward toward your outstretched foot. Stop when you feel a pull in the hamstring. Hold for 15 seconds and repeat with the other leg extended.

#### **Hips**

Lie on your back. Bend your left leg and bring it toward you. Grasp your left knee gently with your right hand and pull it slightly down and to the right until you feel a stretch. Turn your head to the left. Your right leg should stay flat on the floor. Hold for 10 seconds and repeat with the other leg.

## **Low back**

Lay flat on the floor with knees bent. Use your hands to pull them toward your chest. Lift your head and shoulders off the floor until your head is approximately six inches from your knees. Cross your ankles. Gently rock yourself back and forth in this position for 30 seconds.

## **Quadriceps**

Lie on your right side with your right knee bent at a 90-degree angle. Bend your left leg and hold onto the ankle with your left hand. Gently pull your left heel in toward the left side of your butt. As soon as you feel a stretch in your left quad, slowly lower your left knee toward the floor behind your right knee. Hold for 15 seconds and repeat with the other leg.

## **Calves**

Stand an arm's length away from a wall with your feet shoulder-width apart. Slide the left foot back approximately 18 inches, keeping the knee straight and both heels flat on the floor. Bend your right knee and slowly move your pelvis forward until you feel a stretch in the calf and Achilles of the left leg. Hold for 15 seconds and repeat with the other leg.

## **4. Hydration**

Proper hydration is especially important during exercise. Adequate fluid intake for footballers is essential to comfort, performance and safety. The longer and more intensely you exercise, the more important it is to drink the right kind of fluids.

### **Dehydration**

Footballers need to stay hydrated for optimal performance. Studies have found that a loss of two or more percent of one's body weight due to sweating is linked to a drop in blood volume. When this occurs, the heart works harder to move blood through the bloodstream. This can also cause muscle cramps, dizziness and fatigue and even heat illness including:

- Heat Exhaustion
- Heat Stroke

### **Causes of Dehydration**

- Inadequate fluid intake
- Excessive sweating
- Failure to replace fluid losses during and after exercise
- Exercising in dry, hot weather
- Drinking only when thirsty



## Hyponatremia - Water Intoxication

Although rare, you could be at risk of drinking too much water and suffering from hyponatremia or water intoxication. Clearly, drinking the right amount of the right fluids is critical for performance and safety while exercising.

## Adequate Fluid Intake for Footballers

Because there is wide variability in sweat rates, losses and hydration levels of individuals, it is nearly impossible to provide specific recommendations or guidelines about the type or amount of fluids footballers should consume.

Finding the right amount of fluid to drink depends upon a variety of individual factors including the length and intensity of exercise and other individual differences. There are, however, two simple methods of estimating adequate hydration:

- **Monitoring urine volume output and colour.** A large amount of light coloured, diluted urine probably means you are hydrated; dark coloured, concentrated urine probably means you are dehydrated.
- **Weighing yourself before and after exercise.** Any weight lost is likely from fluid, so try to drink enough to replenish those losses. Any weight gain could mean you are drinking more than you need.

## Things that Affect Fluid Loss in Footballers

- **Temperature.** Exercising in the heat increases your fluid losses through sweating and exercise in the cold can impair your ability to recognize fluid losses and increase fluid lost through respiration. In both cases it is important to hydrate.
- **Sweating.** Some athletes sweat more than others. If you sweat a lot you are at greater risk for dehydration. Again, weigh yourself before and after exercise to judge sweat loss.
- **Exercise Duration and Intensity.** Exercising for hours (endurance sports) means you need to drink more and more frequently to avoid dehydration.

To find the correct balance of fluids for exercise, the American College Of Sports Medicine suggests that "*individuals should develop customized fluid replacement programs that prevent excessive (greater than 2 percent body weight reductions from baseline body weight) dehydration. The routine measurement of pre- and post-exercise body weights is useful for determining sweat rates and customized fluid replacement programs. Consumption of beverages containing electrolytes and carbohydrates can help sustain fluid-electrolyte balance and exercise performance.*"

## What about Sports Drinks?

Sports drinks can be helpful to athletes who are exercising at a high intensity for 60 minutes or more. Fluids supplying 60 to 100 calories per 250ml helps to supply the needed calories required for continuous performance. It's really not necessary to replace losses of sodium, potassium and other electrolytes during exercise since you're

unlikely to deplete your body's stores of these minerals during normal training. If, however, you find yourself exercising in extreme conditions over 3 or 5 hours (a marathon, Ironman or ultramarathon, for example) you may likely want to add a complex sports drink with electrolytes.

## **General Guidelines for Fluid Needs During Training**

While specific fluid recommendations aren't possible due to individual variability, most footballers can use the following guidelines as a starting point, and modify their fluid needs accordingly.

### **Hydration Before Training**

- Drink about 250-500ml, 2-3 hours before exercise
- Drink 250ml 10-15 min before exercise

### **Hydration During Exercise**

- Drink 250ml every 10-15 min during exercise.
- If exercising longer than 90 minutes, drink 250ml of a sports drink (with no more than 8 percent carbohydrate) every 15 - 30 minutes.

### **Hydration After Exercise**

- Weigh yourself before and after exercise and replace fluid losses.
- Drink 500-700ml water for every 1 lb lost.
- Consume a 4:1 ratio of carbohydrate to protein within the 2 hours after exercise to replenish glycogen stores.

## **5. Performance Analysis**

Performance Analysis is the provision of feedback to performers trying to get a positive change in performance. Essentially it is about telling the player what actually happened as opposed to what they perceived to be happening. Research shows that on average, athletes and coaches can only recall 30% of performance correctly - performance analysis helps with the remaining 70%.

The analysis can either take place immediately following the performance i.e. side of the pitch or training ground, or can take place in the laboratory in a more controlled environment. One of the benefits of providing immediate feedback is providing the player with the opportunity to make adjustments to improve performance straight away. But the coach is valuable to the analysis as spotting the problem is easy, but the trick is how to fix it and that's where the coach comes in.

There are a variety of performance analysis techniques employed by advisors and which type used depends largely on whether the session takes place in training or competition. Within a training environment immediate visual feedback software would be used which offer images pre and post-feedback for comparison. In a competitive environment, the performer would look at the profile and stats of their

opponent for the next day; they would then discuss the data and that would contribute, along with past experiences, to a game-plan.

## **6. Strength and Conditioning**

Strength and Conditioning is the physical and physiological development of players for elite sport performance. The role of the coach is to bridge the gap between the theory of training and actual training, helping players to become faster, stronger and more flexible and to build their muscular endurance so they perform better and remain injury free.

Strength and Conditioning is about more than lifting weights - it encompasses the entire development of the player and what is needed to improve physical performance. This includes plyometrics, speed and agility, endurance and core stability with strength training being just one piece of the jigsaw.

A Strength and conditioning coach works alongside the football coach to assist them in designing specific programmes that will address the particular need of the player and team. There are many ways that a well-constructed programme can add to the rehabilitation, speed, agility, endurance and strength of the footballers - a periodised programme that targets both strengths and weaknesses will produce the best possible performance.

### **Core Conditioning**

Core conditioning and abdominal conditioning are not the same. Working the abdominal muscles alone is over-rated when it comes to real core strength or conditioning. In reality, the abdominal muscles have very limited and specific action. The "core" actually consists of many different muscles that stabilize the spine and pelvis and run the entire length of the torso. These muscles stabilize the spine, pelvis and shoulder and provide a solid foundation for movement in the extremities.

Core conditioning exercise programs need to target all these muscle groups to be effective. The muscles of the core make it possible to stand upright and move on two feet. These muscles help control movements, transfer energy, shift body weight and move in any direction. A strong core distributes the stresses of weight-bearing and protects the back.

### **What are the Core Muscles?**

The list of muscles that make up the "core" is not exact and different experts include different muscles. In general, the muscles of the core run the length of the trunk and torso; and when they contract they stabilize the spine, pelvis and shoulder girdle and create a solid base of support. We are then able to generate powerful movements of the extremities. The following list includes the most commonly identified core muscles as well as the lesser known groups. The goal of core stability is to maintain a solid, foundation and transfer energy from the centre of the body out to the limbs. Muscles that accomplish this goal include:

- **Rectus Abdominis** - located along the front of the abdomen, this is the most well-known abdominal muscle and is often referred to as the "six-pack" due to its appearance in fit and thin individuals.
- **Erector Spinae** - This group of three muscles runs along your neck to your lower back.
- **Multifidus** - located under the erector spinae along the vertebral column, these muscles extend and rotate the spine.
- **External Obliques** - located on the side and front of the abdomen.  
**Internal Obliques** - located under the external obliques, running in the opposite direction.
- **Transverse Abdominis (TVA)** - located under the obliques, it is the deepest of the abdominal muscles (muscles of your waist) and wraps around your spine for protection and stability.
- **Hip Flexors** - located in front of the pelvis and upper thigh.
- **Gluteus medius and minimus** - located at the side of the hip
- **Gluteus maximus, hamstring group, piriformis** - located in the back of the hip and upper thigh leg.
- **Hip adductors** - located at medial thigh.

## **Strengthening the Core Reduces Back Pain**

Abdominals get all the credit for protecting the back and being the foundation of strength, but they are only a small part of what makes up the core. In fact, it is weak and unbalanced core muscles that are linked to low back pain. Weak core muscles result in a loss of the appropriate lumbar curve and a swayback posture. Stronger, balanced core muscles help maintain appropriate posture and reduce strain on the spine.

## **Core Strength Training and Athletic Performance**

Because the muscles of the trunk and torso stabilize the spine from the pelvis to the neck and shoulder, they allow the transfer of powerful movements of the arms and legs. All powerful movements originate from the center of the body out, and never from the limbs alone. Before any powerful, rapid muscle contractions can occur in the limbs, the spine must be solid and stable and the more stable the core, the most powerful the extremities can contract.

Training the muscles of the core also corrects postural imbalances that can lead to injuries. The biggest benefit of core training is to develop functional fitness - that is, fitness that is essential to both daily living and regular activities.

Core strengthening exercises are most effective when the torso works as a solid unit and both front and back muscles contract at the same time, multi joint movements are performed and stabilization of the spine is monitored.

## **Strengthening the Core Muscles**

There are many exercises that will strengthen the core, as well as exercise equipment that will aid this training. Some of the best products for developing core strength include:

- Medicine Balls
- Kettlebells
- Stability Balls
- Balance Products such as the Bosu Ball, balance boards, wobble boards and others

### **No Equipment Core Strength Exercises**

Body weight exercises are very effective for developing core strength. They are also the type of exercises many athletes and coaches rely on for regular core training. They include:

**Abdominal Bracing** - This is the main technique used during core exercise training. It refers to the contraction of the of the abdominal muscles. To correctly brace, you should attempt to pull your navel back in toward your spine. This action primarily recruits transverse abdominus. Be careful not to hold your breath – you should be able to breathe evenly while bracing.

#### **Plank Exercise:**



Plank: Start Position



Plank: Finish Position

### Side Plank Exercise:



Side Plank: Start Position



Side Plank: Finish Position

- The Basic Push Up
- Back Bridge
- Hip Lift
- Squats
- V-sits
- Lunges
- Side Lunges
- Back Extensions

Other exercises that develop core strength include exercises on a stability ball, work with medicine balls, wobble boards and Pilate's exercise programs. Yoga is also an excellent way for athletes to build core strength. For a simple core strength program you can begin with push-ups and crunches, but your coach will find the exercises that work best for you.

## 7. Warm Up and Down

Most footballers perform some type of regular warm-up and cool down during training and matches. A proper warm up can increase the blood flow to the working muscle which results in decreased muscle stiffness, less risk of injury and improved

performance. Additional benefits of warming up include physiological and psychological preparation.

### **Benefits of a Proper Warm Up**

- **Increased Muscle Temperature** - The temperature increases within muscles that are used during a warm-up routine. A warmed muscle both contracts more forcefully and relaxes more quickly. In this way both speed and strength can be enhanced. Also, the probability of overstretching a muscle and causing injury is far less.
- **Increased Body Temperature** - This improves muscle elasticity, also reducing the risk of strains and pulls.
- **Blood Vessels Dilate** - This reduces the resistance to blood flow and lower stress on the heart.
- **Improve Efficient Cooling** - By activating the heat-dissipation mechanisms in the body (efficient sweating) an athlete can cool efficiently and help prevent overheating early in the event or race.
- **Increased Blood Temperature** - The temperature of blood increases as it travels through the muscles, and as blood temperature rises, the amount of oxygen it can hold becomes reduced. This means a slightly greater volume of oxygen is made available to the working muscles, enhancing endurance and performance.
- **Improved Range of Motion** - The range of motion around a joint is increased.
- **Hormonal Changes** - Your body increases its production of various hormones responsible for regulating energy production. During warm-up this balance of hormones makes more carbohydrates and fatty acids available for energy production.
- **Mental Preparation** - The warm-up is also a good time to mentally prepare for training by clearing the mind, increasing focus, reviewing skills and strategy. Positive imagery can also relax the athlete and build concentration.

### **Advice on How to Warm Up**

Warm up for about 5-10 minutes. How long you warm up will often depend on what you're doing and how much time you need to transition into exercise. For example, if you're working out on a cold day or doing a very hard work-out, you may need 10 or more minutes to warm up. If you're doing a light workout or you're already warm from doing other activities, you may need just a few minutes.

Stretch if you need it. There's some controversy over whether to stretch before or after your workout. I often recommend that my clients do the bulk of their stretching after the cool down. But, if you have chronically tight muscles (like your lower back or hips) doing a few stretches beforehand may make your workout more comfortable.

Take your time. The idea is to warm up gradually. Allowing your heart rate and respiration to increase slowly will make the transition into your workout easier and give your body time to prepare for what's to come.

Your coach will provide you with a series of warm up exercises that you can do at home as well as on the training ground.

## **10 Ways to Recover Quickly After Exercise**

There are as many methods of recovery as there are athletes. The following are some of the most commonly recommended by the experts.

### **1. Rest**

Time is one of the best ways to recovery (or heal) from just about any illness or injury and this also works after a hard training session. Your body has an amazing capacity to take care of itself if you allow it some time. Resting and waiting after a hard session allows the repair and recovery process to happen at a natural pace. It's not the only thing you can or should do to promote recovery, but sometimes doing nothing is the easiest thing to do.

### **2. Stretch**

If you only do one thing after a tough training session, it should be stretching. This is a simple and fast way to help your muscles recovery.

### **3. Cool Down**

Cooling down simply means slowing down (not stopping completely) after exercise. Continuing to move around at a very low intensity for 5 to 10 minutes after a training session helps remove lactic acid from your muscles and may reduce muscles stiffness. warming up and cooling down are more helpful in cooler temperatures or when you have another exercise session or an event later the same day.

### **4. Eat Properly**

After depleting your energy stores with exercise, you need to refuel if you expect your body to recover, repair tissues, get stronger and be ready for the next challenge. This is even more important if you are performing endurance exercise day after day or trying to build muscle. Ideally, you should try to eat within 60 minutes of the end of your workout and make sure you include some high-quality protein and complex carbohydrate.

### **5. Replace Fluids**

You lose a lot of fluid during exercise and ideally, you should be replacing it during exercise, but filling up after exercise is an easy way to boost your recovery. Water supports every metabolic function and nutrient transfer in the body and having plenty of water will improve every bodily function. Adequate fluid replacement is even more important for endurance athletes who lose large amounts of water during hours of sweating.



## **6. Try Active Recovery**

Easy, gentle movement improves circulation which helps promote nutrient and waste product transport throughout the body. In theory, this helps the muscles repair and refuel faster.

## **7. Have a Massage**

Massage feels good and improves circulation while allowing you to fully relax. You can also try self-massage.

## **8. Alternate Hot and Cold Baths or Showers**

Some athletes swear by ice baths, ice massage or alternating hot and cold showers to recover faster, reduce muscle soreness and prevent injury. The theory behind this method called contrast water therapy is that by repeatedly constricting and dilating blood vessels helps remove (or flush out) waste products in the tissues. Limited research has found some benefits of contrast water therapy at reducing delayed onset muscle soreness (DOMS).

**The process:** While taking your post-exercise shower, alternate 2 minutes of hot water with 30 seconds of cold water. Repeat four times with a minute of moderate temperatures between each hot-cold spray. If you happen to have a spa with hot and cold tubs available, you can take a plunge in each for the same time.

## **9. Get Lots of Sleep**

While you sleep, amazing things are taking place in your body. Optimal sleep is essential for anyone who exercises regularly. During sleep, your body produces Growth Hormone (GH) which is largely responsible for tissue growth and repair.

## **10. Avoid Overtraining**

One simple way to recovery faster is by designing a smart workout routine in the first place. Excessive exercise, heavy training at every session or a lack of rest days will limit your fitness gains from exercise and undermine your recovery efforts.