KENT SPORTS DEVELOPMENT UNIT

Sportssheet

Sport, Leisure & Olympics Service, Kent County Council

Injury prevention for sports people

Athletes want to spend their time training and competing and not stuck on the side lines or in a treatment room. Being injured can decrease the amount of time an athlete is able to train and compete effectively and injury rates could be cut by up to 25 per cent if athletes took the proper preventative steps. Should an injury occur, it is recommended that medical advice is sought as soon as possible from a suitably qualified practitioner. The quicker an injury is diagnosed and treatment is started the less likely the injury will become chronic and persistent in nature.

The popular quote "no pain no gain" holds no credibility within the sports world. Pain indicates that something is wrong and training should stop immediately to determine the source of the pain. It is important to understand the difference between discomfort felt when training hard, and exercising when injured. When injured, common sense is of prime importance. Injuries are to a large extent preventable and whilst some are due to accidents, others are due to poor training, insufficient warm up, improper equipment, and an athlete being in poor physical condition. By following some simple guidelines training can be made safer and more effective.

Warm up / Cool down

A warm up should take place before any training session. This will prepare the body for exercise by increasing body temperature and heart rate, as well as blood flow to the muscles. This allows muscles and tendons to become more elastic, which enables muscles to be stretched further without the fear of injury. A warm up should last around 10-15 minutes and training or activity should start immediately following the warm up routine. A good warm up routine will usually start with light exercise to raise the heart rate and warm up the muscles and light sweating is a good indication that the muscle temperature has increased. At this point gentle stretching is usually recommended, concentrating on the muscles to be used during the activity.

Immediately after training has finished a cool down period is essential and should consist of a period of gentle exercise. This helps to stabilise blood pressure and lower the heart rate, allowing the body to gradually return to its resting state. The period of gentle exercise should be followed by a routine of static stretches for the muscles that have been used during training. These stretches should be held for longer than in the warm up, in order to help reduce the feeling of muscle soreness or 'heavy legs'.

Flexibility

Maintaining a good level of flexibility is essential, is important for successful performance, and can also help to prevent injuries. A lack of flexibility is likely to result in uncoordinated or awkward movements that may ultimately lead to injury. A flexibility programme can assist in increasing the range of motion around various joints and stretching the muscles and tendons around joints will in time, increase the range of motion possible.

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Improving flexibility will also increase performance due to a variety of factors, including improved balance and reaction time. Stretching exercises for all areas of the body used in training, should be included in the warm up and cool down sessions. The safest way to stretch is with static stretches and it is recommended that each stretch is held for thirty seconds and repeated three times.

Muscle Imbalance

Muscle imbalance is when one muscle group becomes stronger or weaker than the other. Muscles can be divided into two types, mobilisers and stabilisers, which have different characteristics. Mobilisers are found close to the body's surface and tend to produce power but lack endurance. With time and use they tend to tighten and shorten. Stabilisers, are found deeper, are for endurance and tend to become weaker and longer with time. Both groups of muscles work alongside each other to move the body, but the mobilisers can stop the stabilisers working, which is when an imbalance occurs.

An example of a common muscle imbalance is in the muscles of the upper leg. Most people work hard to strengthen the front part of their leg (quadriceps) but often do less when it comes to exercising the back of the leg (hamstrings). A muscle imbalance in the upper leg can result in knee injuries, hamstring strains and back pain.

Technique

In sport a series of techniques is often combined to create a more complex movement pattern and good technique often involves well-timed and coordinated muscle movements. Using the correct techniques in any sport will optimise high level performance and can also reduce the risk of injury. An athlete with poor technique may at first perform well, but they ultimately place themselves at risk of injury. Sports performance usually involves a high level of coordination, so some form of coordination work should be built into an athlete's training.

Posture and flexibility should also be considered when looking at technique, as incorrect posture during activity can place excess strain on certain areas of the body. A training programme for the trunk and limbs may aid posture and technique, thus improving performance and decreasing the risk of injury.

Training Errors / Over-training

Training errors are among the most common factors in causing sports injuries and therefore a basic understanding of different training elements is important.

There are a number of general training principles that apply to all sports, including overload, specificity, recovery, reversibility and individuality.

Overload involves a stress being applied to the body over and above that which is normally encountered in performance and usually relates to the intensity and duration of training. Provided that the stress is not excessive and adequate time for the body to rest and adapt is allowed, the capacity of the athlete to work harder in future will be increased. However, over-training can lead to injury, hence any new increases in training should be followed by adequate recovery time.

If the training exercise does not stress the body sufficiently, it will not adapt accordingly. In general terms the amount, or volume, of training should be increased gradually before the intensity of training. Determining the amount of overload that will benefit performance without incurring injury is difficult as all athletes are different. Therefore, athletes should be carefully monitored for signs of over-training and unexplained decreases in performance, particularly during periods of high-intensity training. As well as a gradual progression of volume and intensity, care must also be taken that the amount and intensity of new training activities are introduced slowly, as these can stress different muscle groups and joints, especially in children.

A training programme that suits one individual may be quite inappropriate for another individual even in the same sport and therefore training must be tailored to the individual's needs. Differences between individuals occur in their ability to deal with training loads, their response to specific training, their speed of recovery, as well as their genetic and psychological make-up, their diet and lifestyle. For these reasons, an individualised approach to training is needed.

Adequate recovery is essential if the full effect of training is to be gained and injuries prevented. Inadequate recovery impairs performance and the athlete can show signs of tiredness and lethargy. In these circumstances rest is required but it is often the case that athletes respond by increasing training, as they believe they are lacking fitness. This may lead on to the development of 'over training syndrome' and it is important for the athlete and coach to monitor training, including rest days, the amount of sleep and possibly dietary information within a training diary.

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Distinguishing over-training from normal tiredness from training is difficult and can only be recognised once an athlete has failed to recover within a 3 week period of reduced training. If an athlete doesn't recover once the training load has been reduced, medical advice should be sought.

If an athlete over-trains they may show one or more of the following symptoms:

- **Underperformance**
- **Depression with loss of motivation**
- **Increased anxiety and irritability**
- **Sleep disturbance**
- **Loss of appetite and weight**
- **Tiredness, heavy feeling muscles**
- **Frequent minor infections, particularly respiratory infections**
- **Raised resting pulse rate**

Nutrition

Inadequate nutrition may indirectly lead to injury as it can affect the recovery process. Inadequate glycogen (e.g. carbohydrates such as bread, pasta etc.) repletion following exercise may cause a chronic glycogen depleted state, if this happens recurrently over a period of time. Research shows that in this state, the body relies on fat and protein stores as alternative energy sources which may result in increased protein (muscle) breakdown and possibly lead to soft tissue injury. Female athletes who exercise intensively but have low body fat tend to develop menstrual irregularities and it appears that this group of women can be susceptible to stress fractures. Similarly, people suffering from eating disorders such as anorexia nervosa and bulimia, are also likely to have an increased susceptibility to bone injuries. For more information on nutrition and diet see the 'Nutrition for Sports People' Sportssheet.

Another key factor in preventing injuries is to stay well hydrated. A dehydrated body does not absorb the stresses of exercise so well and by exercising when dehydrated, the likelihood of developing an overuse injury may be increased. However, water for some can lack taste and can 'turn off your thirst' before rehydration. Water also lacks the electrolytes and energy needed for optimal performance and therefore some athletes choose other drinks which provide these. Tea, coffee and alcohol intake should be minimised as these are diuretics that lead to dehydration. An athlete should try to drink regularly (every 10 – 15 minutes during workouts) rather than wait to feel thirsty as, by then, dehydration has already occurred.

Equipment and clothing

Protective equipment and clothing made specifically for sports and different ages can help prevent injuries in contact and collision sports. Protective pads, mouth guards, helmets, gloves and other equipment recommended by governing bodies of sport should be worn in training and for matches. Protective equipment that fits well can prevent a range of injuries and athletes should not play without correctly fitting or required safety gear.

Know and abide by the rules of the sport

Rules are designed to keep things safe during a game. It is extremely important for anyone who participates in a contact sport to stick to the rules - they are there to keep athletes safe.

Previous Injury

One of the best predictors of injury is having a prior history of injury to an area, which has not been adequately treated or rehabilitated. The best way to prevent an initial injury re-occurring frequently is to seek advice from a suitably qualified medical practitioner when the initial injury occurs. It is important to follow their advice and the rehabilitation programme they set. This will help recovery and a return to performing in the recommended time frame, will help to minimise the chance of the original injury re-occurring in the future.

What is Prehab / How to Prehab?

Prehab is an individual exercise programme that is usually carried out prior to an operation to ensure that an injury is treatable. However, for the purposes of this paper a Prehab programme provides sports specific exercises tailored to an athlete's needs and aims to prevent injuries. A Prehab programme should address a balance between range of motion, strength, coordination and stabilisation and should compare left to right, front to back, upper to lower body. Exercises and sports specific skills and drills are focused on an athlete's weaknesses, with the majority of the programme concentrating on co-ordination and stabilisation of the hips, stomach and back (sometimes referred to as 'core stability'). Core instability is common and is often due to the lack of a proper training programme. Many athletes and coaches use traditional

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methods of upper and lower body lifting or basic sprinting routines, outside of regular practice drills which can leave the hips, stomach and back without a direct training routine.

What should you do if you're injured?

A useful acronym that may help when an athlete is initially injured is: **'PRICE'**

Protection: Support the injured area by taping or strapping it, to help prevent further injury to the area. Withdraw from training and/or competition if injured.

Rest: Continuing to exercise immediately after an injury has occurred can make the injury worse. Resting for 48-72 hours is usually a good initial treatment strategy. Avoid applying heat or soaking in a bath at this stage as this may make things worse.

Ice: Apply an ice pack to the injury as soon as possible (frozen vegetables make a good substitute). Protect the skin by wrapping the ice pack in a damp towel and apply the pack for about ten minutes and repeat every two hours.

Compression: Compression is important to help reduce swelling, however if applying a compression bandage, use a stretchy one and don't apply it too tightly.

Elevation: Try to elevate the injured part whenever possible - ideally elevate it above the level of the heart.

When to seek medical advice?

In most instances, the severity of an injury is usually indicated by the level of pain; the worse the pain, the more serious the injury is likely to be. If severe pain or immediate swelling is experienced medical advice should be sought. In other situations the best policy is to apply the 'PRICE' principle straight away, and if the injury does not improve significantly within 48 hours, seek advice from a qualified practitioner such as a Physiotherapist.

How do you know when you are ready to return?

If you are undergoing treatment by a qualified practitioner they will advise on which activities and at what stage in the rehabilitation programme they can be undertaken. Generally the criteria for returning to sport will be that the athlete has: **(1)** No pain, **(2)** full range of motion at the injured area, **(3)** maximum strength, **(4)** taken part in several training sessions without any recurrence of the injury, and **(5)** will feel ready within themselves to return to full competitive activity.

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