

Drugs and methods in sport – their effects and risks

Using a drug to improve athletic performance is cheating. The World Anti-Doping Agency lists all those drugs that are prohibited either because they are classed as performance enhancing, a health risk or they 'violate the spirit of sport'.

New drugs are being developed all of the time, so the list of banned substances is updated at least once every year. To find out whether or not any particular drug is banned you can check its status on the UK Sport Drug Information Database or click on Fact Sheets.

Although the names of the drugs may differ, some of the types of substances that could be misused in sport are:

- Steroids**
- Stimulants**
- Diuretics**
- Peptide Hormones and Analogues**
- Beta-blockers**
- Narcotic Analgesics**
- Alcohol**
- Cannabis**
- Tobacco**
- Supplements**
- Blood Doping**
- Anti-Oestrogenic Substances (fact sheet coming soon!)**
- Masking Agents (fact sheet coming soon!)**
- Gene Doping (fact sheet coming soon!)**
- Physical, Chemical and Pharmacological manipulation (fact sheet coming soon!)**



Steroids

also called **anabolic agents**
and **androgenic anabolic steroids**

What are they?

Steroids are natural or man-made substances that act like the hormone testosterone. Both men and women have testosterone naturally in their bodies but males have more, which is why they tend to grow larger, stronger and hairier than females. Steroids stimulate the development of male sexual characteristics and the build-up of muscle tissue. They are sometimes used medically to help recovery from an operation and to treat breast cancer.

Why do some athletes use them?

Because of their effect on the build-up of muscle tissue, athletes may be tempted to use steroids in any sport where strength, speed or size is an advantage in order to increase their muscle strength and power. Athletes have been known to take steroids during training to allow them to train harder and in competition to increase their aggression and competitiveness.

WHAT ARE THE RISKS?

Steroids affect the body's natural hormonal balance and cause a range of serious side effects. Many of the side effects are permanent and do not disappear once steroid use has stopped.

HARMFUL EFFECTS ON BOTH MALES AND FEMALES CAN INCLUDE:

- increased violence, aggression, extreme mood swings and personality changes (sometimes known as 'Roid Rage')
- serious damage to the liver
- an increased risk of heart disease, kidney damage and cancer
- an increased risk of muscle injury
- adolescents may permanently stop growing

HARMFUL EFFECTS ON MALES CAN INCLUDE:

- development of breasts (these do not always disappear when the steroid use is stopped)
- hardening and shrinking of testicles and reduced sperm production
- impotence

HARMFUL EFFECTS ON FEMALES CAN INCLUDE:

- development of male features such as a deep voice, facial and body hair
- stopping of menstrual periods
- changes in the sexual organs
- miscarriage or damage to the baby if steroids are used during pregnancy
- infertility

increased violence, aggression, extreme mood swings and personality changes (sometimes known as 'Roid Rage')

an increased risk of heart disease, kidney damage and cancer

an increased risk of muscle injury

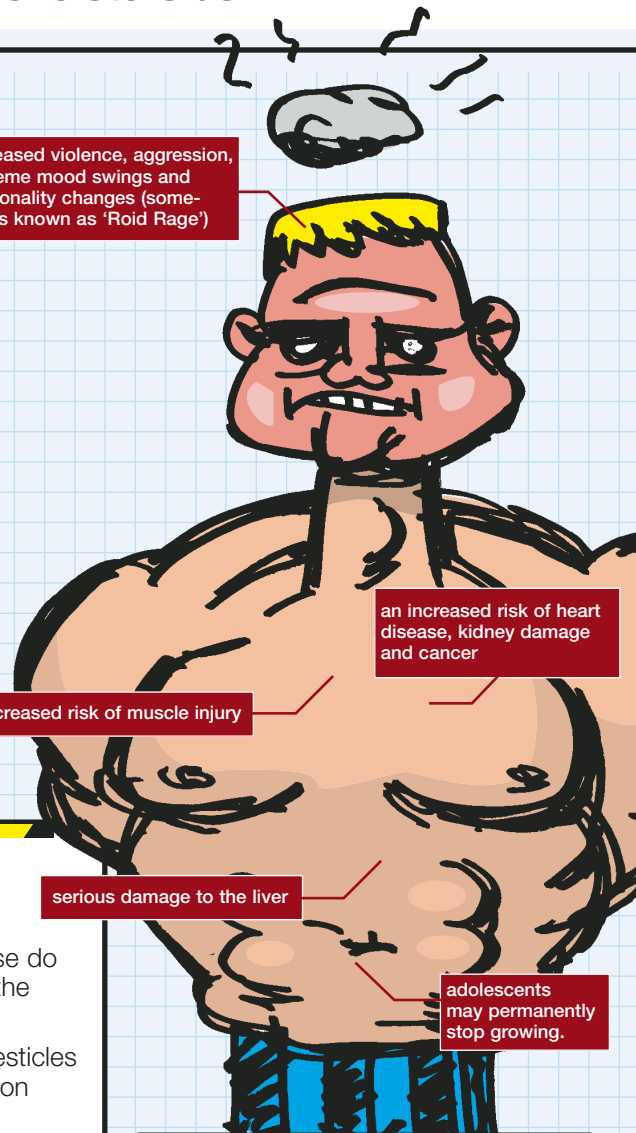
serious damage to the liver

adolescents may permanently stop growing.

ARE THEY BANNED?

Steroids are banned both for use in and out of competition in all sports. In the UK steroids are a Class C drug which means that it is a criminal offence to produce or supply them.

For further information about steroids, visit the UK Sport Drug Information Database and click on Fact Sheets.



Stimulants

What are they?

Stimulants are a class of drugs that act on the central nervous system in the same way as the hormone adrenalin, by speeding up parts of the brain and the body's reactions. Common street drugs that are stimulants include cocaine, amphetamines (Speed) and Ecstasy.

Caffeine in coffee, tea, chocolate and cola drinks is a stimulant and has only recently been removed from the list of banned substances.

Stimulants are also often found in cold and hay fever remedies and in herbal and nutritional substances that can be bought without a prescription. Athletes must take great care to check any medication or supplements that they take in order to avoid unknowingly taking more than an allowed level of a stimulant.

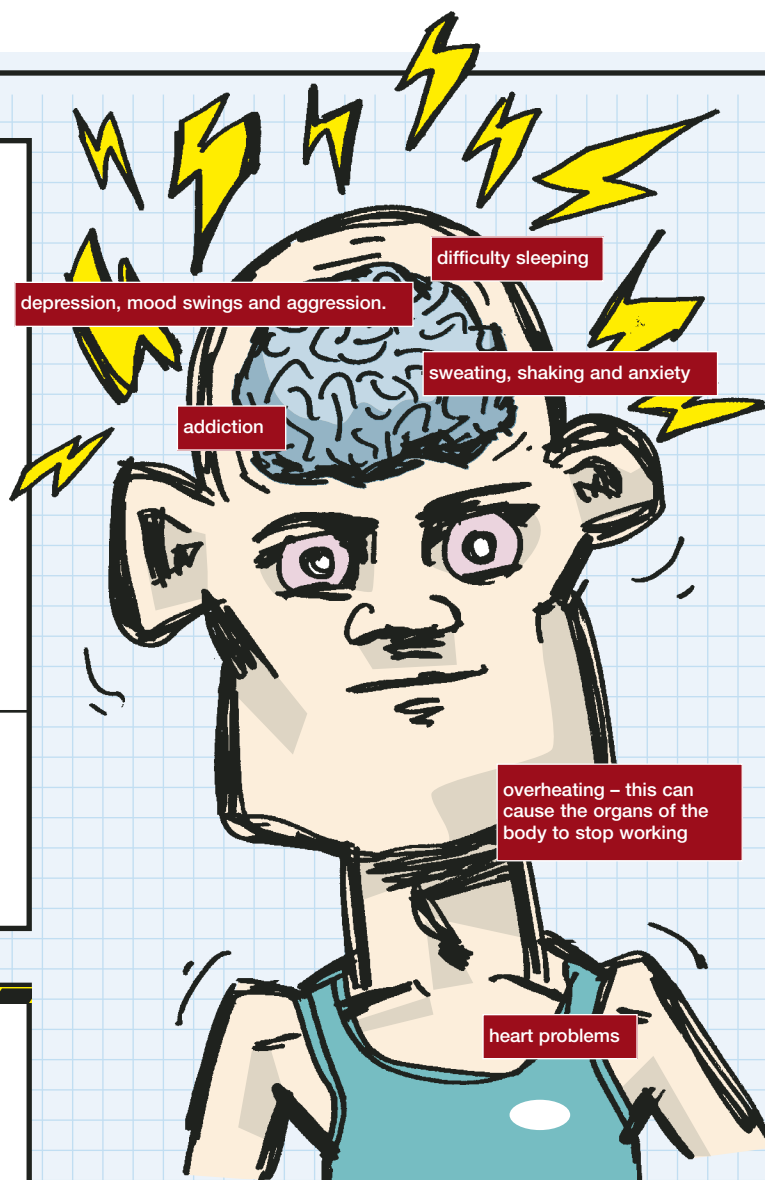
Why do some athletes use them?

Stimulants can make an athlete feel more competitive and more alert. They stop the athlete feeling tired or hungry. Athletes might use stimulants to help lose weight and to help them exercise for longer.

WHAT ARE THE RISKS?

Stimulants make the heart beat faster and increase the body temperature and breathing rate. They can also cause the following harmful effects:

- overheating – this can cause the organs of the body to stop working
- difficulty sleeping
- heart problems
- sweating, shaking and anxiety
- addiction
- depression, mood swings and aggression



Are they banned?

Most types of stimulant are prohibited in competition. Some stimulants, such as cocaine, are classified in the UK as a Class A drug and amphetamines and related substances are classified as a Class B drug (or Class A if prepared for injection), making possession and supply a criminal offence.

For further information on stimulants, visit the UK Sport Drug Information Database and click on Fact Sheets.

Diuretics

What are they?

Diuretics are a type of drug that increase the amount of urine produced and therefore reduce the amount of fluid in the body. They can help to reduce tissue swelling and are used medically to treat kidney disease and high blood pressure.

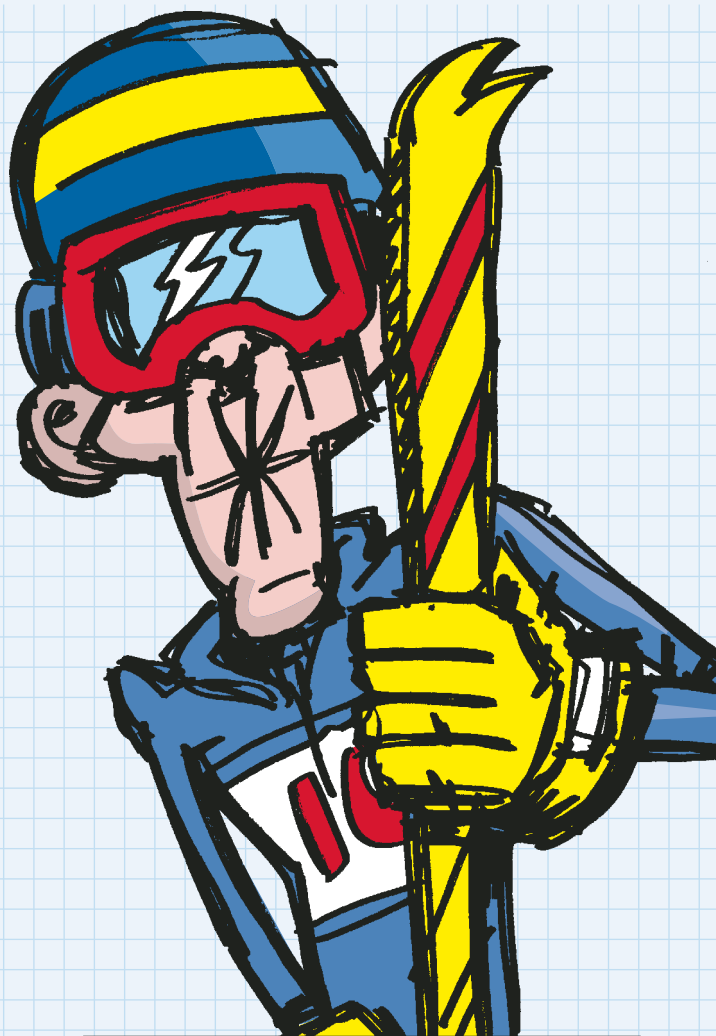
Why do some athletes use them?

Athletes who are involved in sports that have weight categories may be tempted to use diuretics to help lose weight quickly. Sports where weight loss may be an advantage include the martial arts, rowing, boxing, weight lifting and ski jumping. Athletes have also taken diuretics to speed up the rate that other banned drugs are passed out of their body.

WHAT ARE THE RISKS?

The main risk of using diuretics is dehydration. Dehydration means that the body does not have enough water to work properly and can have the following effects:

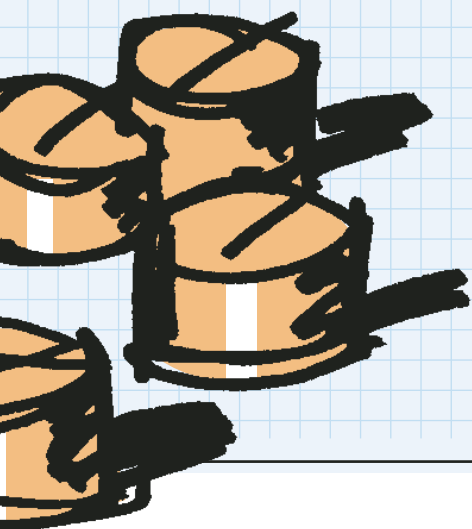
- headaches
- feeling sick and dizzy
- heart and kidney disease
- collapse



Are they banned?

Diuretics are banned in all sports as masking agents (to hide the effects of another prohibited substance) both in and out of competition. In some sports diuretics can be used for medical reasons with permission from a doctor. The use of diuretics is completely prohibited in and out of competition in sports where weight categories are applied.

For further information about diuretics, visit the UK Sport Drug Information Database and click on Fact Sheets.



Peptide Hormones and Analogues

What are they?

Hormones are chemicals that send signals to parts of the body and control certain functions. Hormones are made of peptides which are chains of amino acids. Analogues are man-made chemicals that have the same effect as a hormone.

Why do some athletes use them?

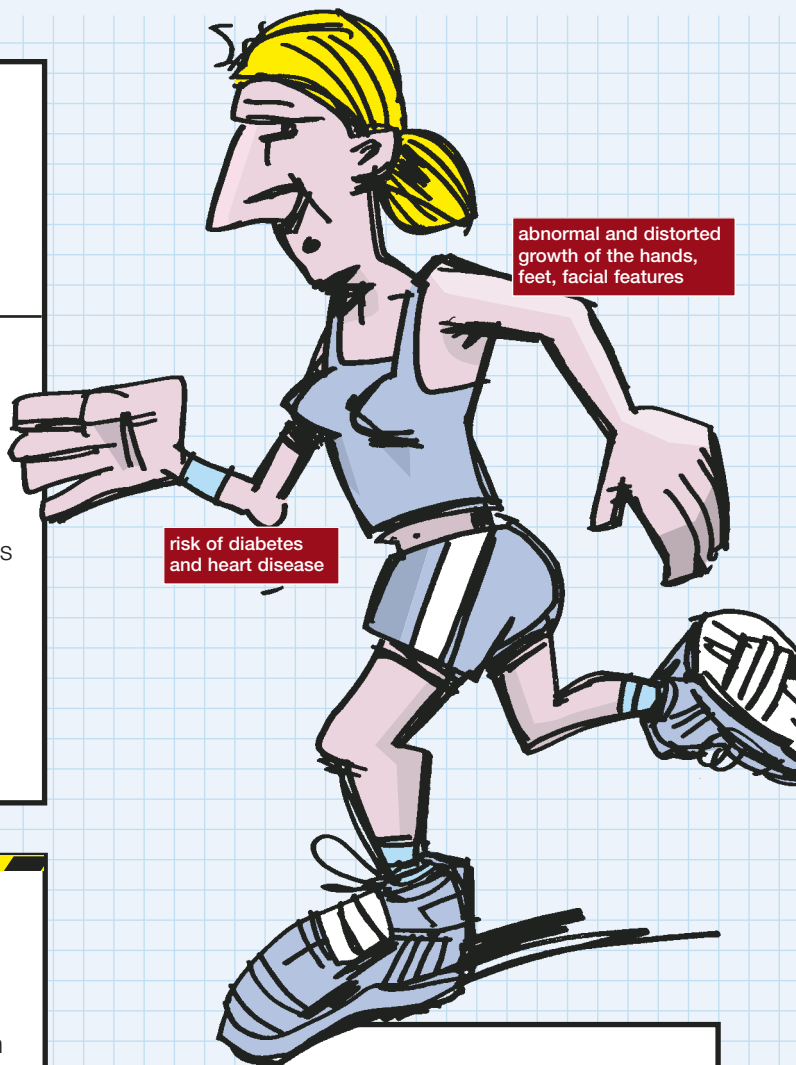
Athletes may be tempted to use a range of different hormones for a variety of reasons. In particular athletes have been known to take human Growth Hormone (hGH) to increase muscle growth and the hormone erythropoietin (EPO) to stimulate the production of oxygen-carrying red blood cells. This might be an advantage in endurance sports such as marathon running and cross country skiing.

Other hormones that have been used by athletes are the female pregnancy hormone chorionic gonadotrophin (hCG) which increases testosterone production and corticotrophin (ACTH) which helps repair damaged muscle and creates a feeling of well-being.

WHAT ARE THE RISKS?

The use of additional hormones in an otherwise healthy person upsets the normal hormonal balance of the body which then attempts to redress the balance. Excess human Growth Hormone in adults causes acromegaly. This is the abnormal and distorted growth of the hands, feet, facial features and bodily organs. It also has other serious side effects including increased risk of diabetes and heart disease.

The use of erythropoietin (EPO) brings with it the serious dangers caused by thickening of the blood, such as the risk of blood clots, stroke and heart attack.



Are they banned?

The use of hormones and their analogues is prohibited in sport. Males only are prohibited from using the female pregnancy hormone hCG and athletes with diabetes are permitted to use insulin with permission from a doctor.

For further information about peptide hormones, visit the UK Sport Drug Information Database and click on Fact Sheets.

Beta-blockers

also known as
anxiety reducing drugs

What are they?

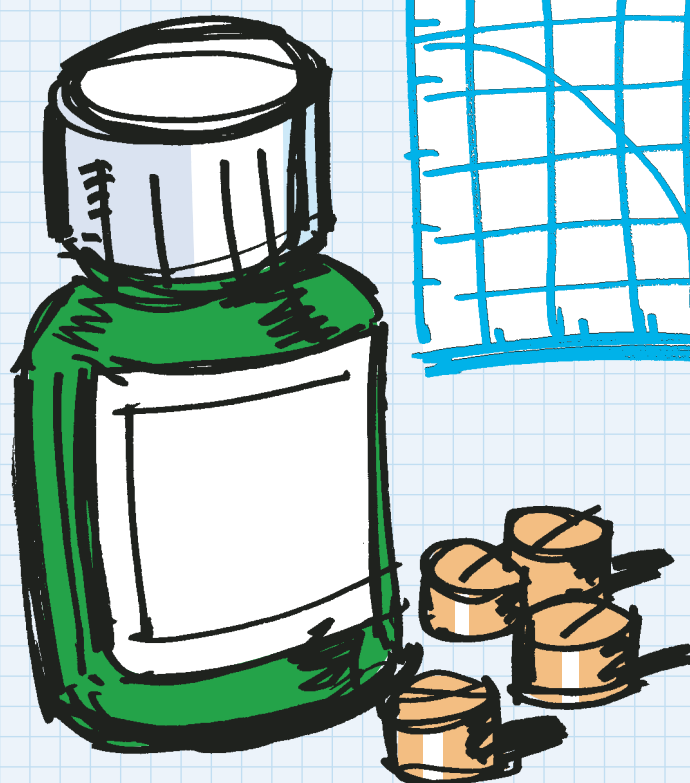
Beta-blockers are a group of drugs used to reduce blood pressure. They work by slowing down the heart rate and preventing dilation of the blood vessels. These effects reduce the workload of the heart and help to prevent heart attacks in people who have heart trouble and high blood pressure.

Why do some athletes use them?

Beta-blockers reduce energy and increase fatigue and so would not improve an athlete's performance in sports requiring stamina or strength. However, they have been used by athletes competing in sports requiring control. Beta-blockers slow down the heart rate and competitors may use them to steady their hand in target sports or to reduce anxiety in sports requiring controlled bodily movements or vehicle control.

WHAT ARE THE RISKS?

If a healthy person takes beta-blockers they run the risk of lowering their blood pressure and slowing their heart rate to dangerously low levels. Some beta-blockers have also been found to increase the chances of depression and actually to increase feelings of anxiety and tension.



Are they banned?

Beta-blockers are prohibited in competition in specified sports, particularly target sports such as archery, shooting, curling and nine-pin bowling. They are also banned in sports involving controlled body movements such as gymnastics, ski jumping and synchronised swimming

and in sports involving control of a vehicle such as bobsleigh and motor cycling.

For a full list of the sports for which beta-blockers are prohibited see the World Anti-Doping Code list of Prohibited Substances and Methods.



Narcotic Analgesics

also known as
painkillers

What are they?

Narcotic analgesics are strong painkillers made from opiates taken from the poppy plant. They work by reducing the amount of pain that is felt by the brain and some narcotic analgesics can give the user a feeling of powerfulness and fearlessness. Well known narcotic analgesics include diamorphine (heroin) and the milder analgesic codeine which is often used in over-the-counter remedies for colds and diarrhoea.

Why do some athletes use them?

Athletes may need to use painkillers to treat an injury. However it may be tempting for an athlete to continue to train or compete with an injury, by using a narcotic analgesic to mask the pain. This could make the original injury worse. Athletes have also been known to use narcotic analgesics in sports such as boxing to raise their pain threshold and reduce fear.

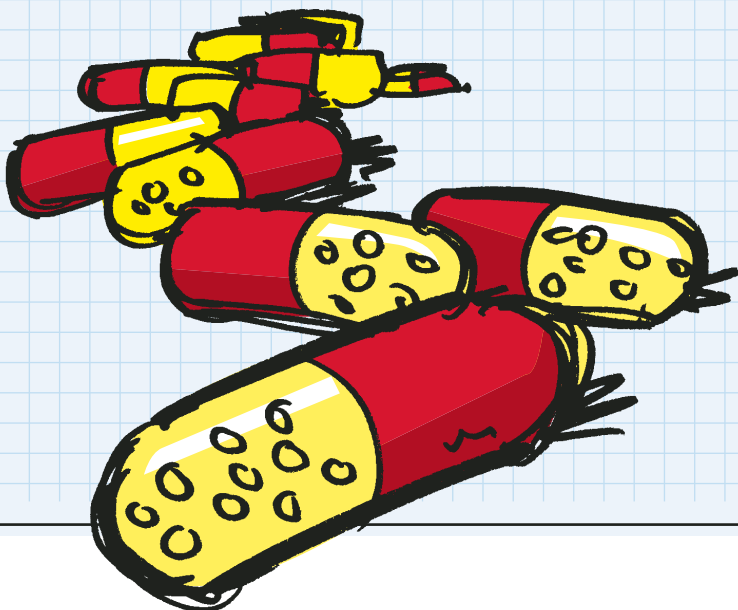
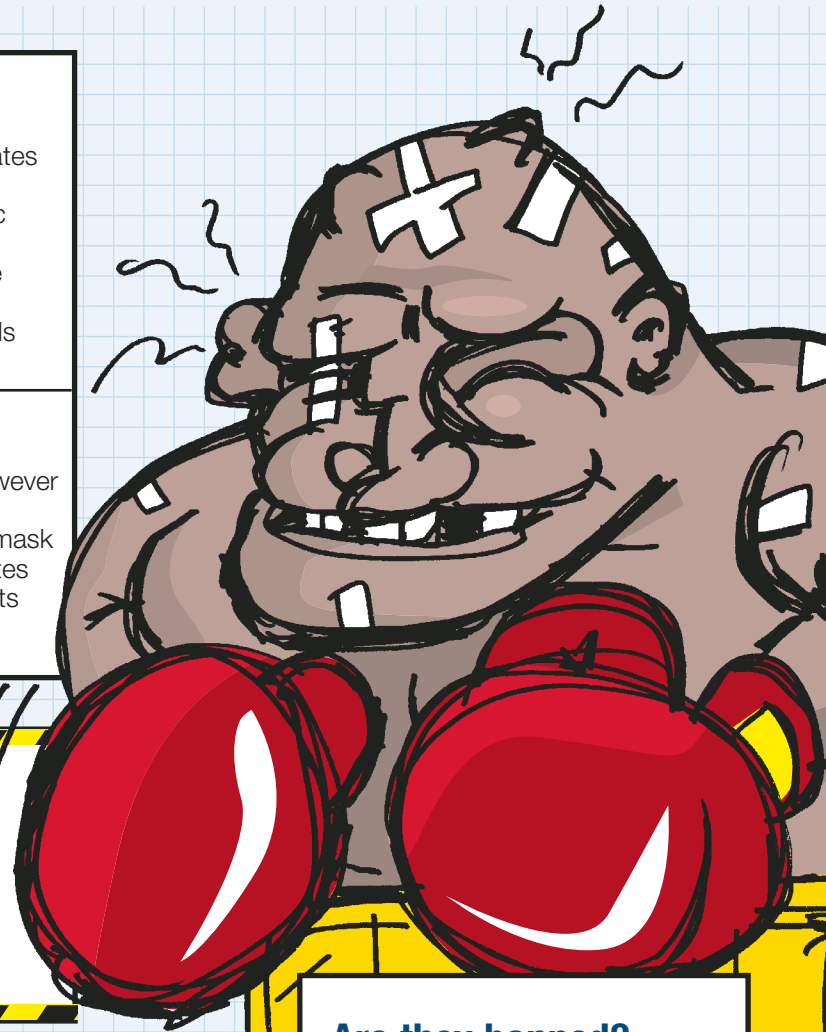
WHAT ARE THE RISKS?

Narcotic analgesics are highly addictive and in high doses they can cause drowsiness, slow breathing, loss of concentration, co-ordination and balance. Overdoses can cause coma and death.

Are they banned?

Certain narcotic analgesics, such as codeine, are permitted in sport. Many others, such as heroin, are prohibited in all sports. Many narcotic analgesics are categorised as Class A drugs in the UK, meaning manufacture, supply and possession of them is a criminal offence.

For further information about narcotic analgesics, visit the UK Sport Drug Information Database and click on Fact Sheets.



Alcohol

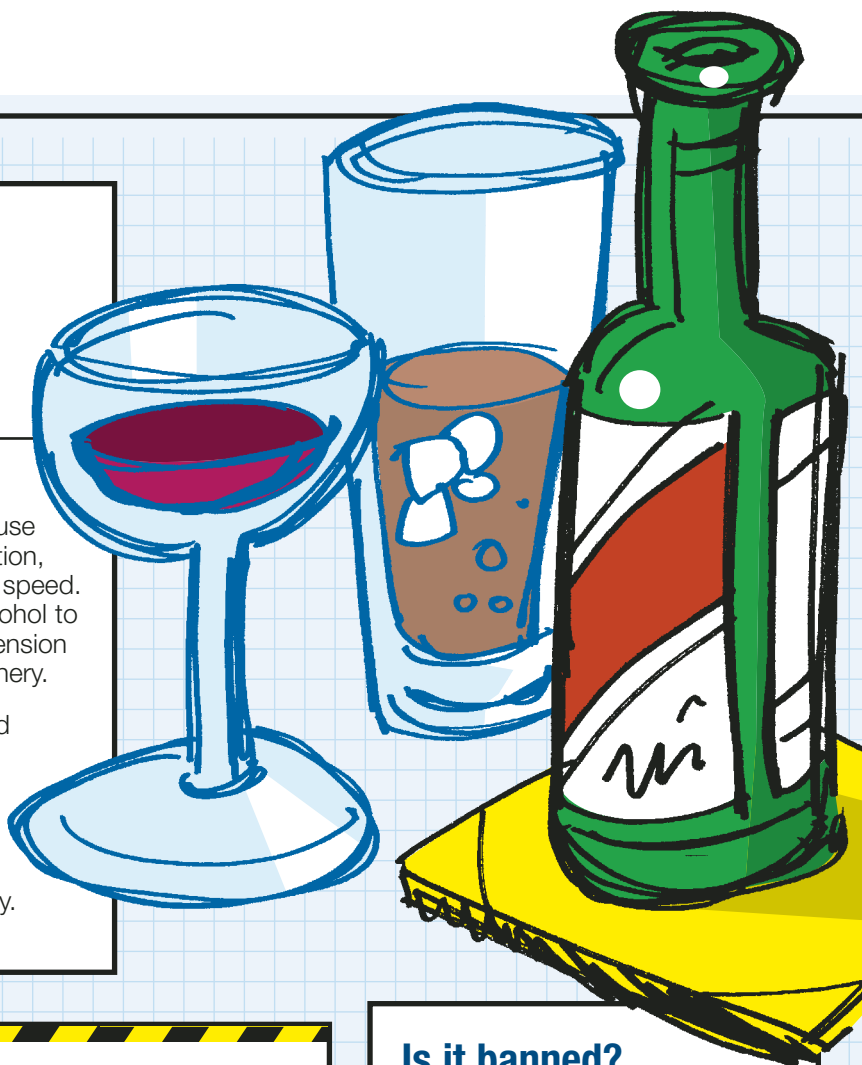
What is it?

Alcoholic drinks contain varying levels of the chemical ethanol. Alcohol acts as a depressant on the central nervous system and in moderate quantities it creates a feeling of relaxation in the user. It causes the blood vessels to dilate and increases the heart rate.

Why do some athletes use it?

Alcohol does not improve athletic performance, because even in small quantities it can interfere with co-ordination, impair balance and vision and decrease strength and speed. However, there have been cases of athletes using alcohol to boost their aggression and confidence or to reduce tension and nerves in target sports such as shooting and archery.

Just as in society generally, alcohol is most often used by athletes as a recreational drug, for example when socialising with team mates or celebrating a victory. Some athletes wrongly believe that they can increase their energy levels from the carbohydrates in beer but in fact alcohol is metabolised slowly in the liver and actually contributes nothing to muscle energy.



WHAT ARE THE RISKS?

In moderate quantities, alcohol can give the user a feeling of over confidence, causing them to take dangerous risks. Alcohol has a diuretic effect (although it is not classed as a diuretic) which can lead to a risk of dehydration. It decreases strength, power, muscular and cardiovascular endurance and impairs reaction time, balance and co-ordination. These effects continue long after the blood alcohol concentration has fallen to zero. So an athlete's performance can be badly affected in competition after a night of only moderate drinking.

Alcohol is addictive and heavy drinking over a long period can cause serious mental and physical disorders. Alcoholics have a high risk of developing pancreas, kidney and liver diseases, as well as causing permanent brain damage and impairing many other chemical and hormonal reactions throughout their body.

Is it banned?

Alcohol is prohibited in competition in certain sports. These include sports requiring control of a vehicle such as aeronautics and motor cycling, as well as others such as triathlon, karate and gymnastics. The levels of alcohol permitted in the bloodstream vary from sport to sport and it is the responsibility of the athlete to ensure that they comply with the rules of their sport.

For a full list of the sports and the levels at which alcohol is prohibited see the World Anti-Doping Code list of Prohibited Substances and Methods.

Cannabis

also known as marijuana, hashish, cannabinoids, pot

What is it?

Cannabis is the most commonly used illicit drug in the UK and is made from the dried flowers, leaves or resin of the cannabis plant. The active chemical in cannabis is THC (delta-9-tetrahydrocannabinol) and this causes a series of reactions in the brain that lead to feelings of relaxation and reduced inhibition.

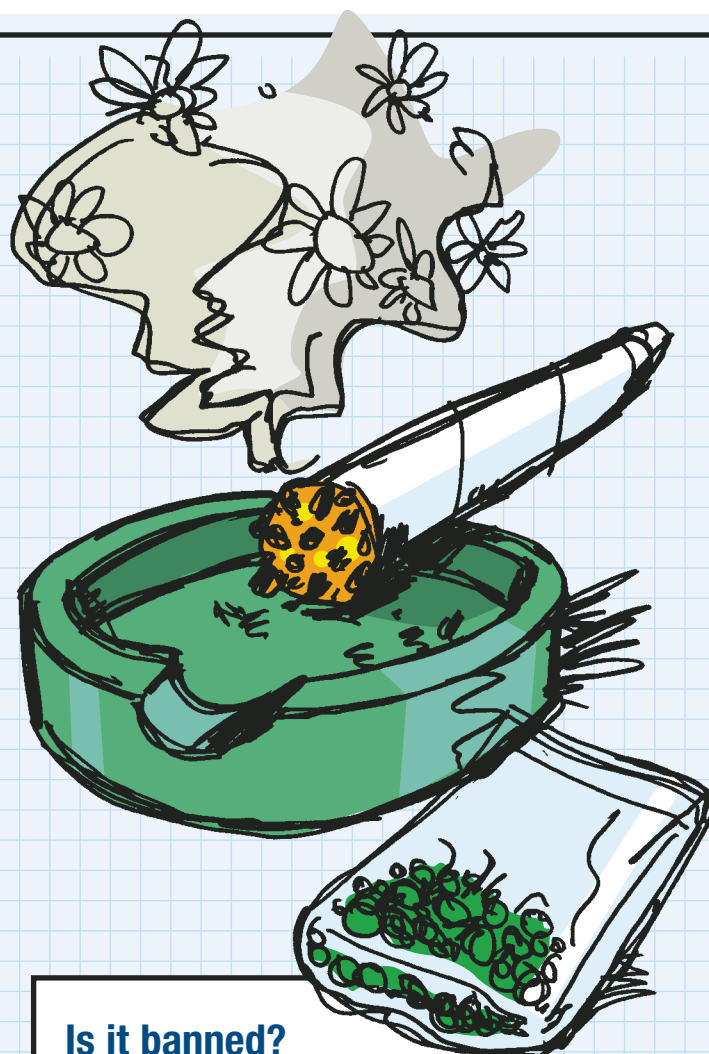
Why do some athletes use it?

Athletes are unlikely to use cannabis to improve their performance because of its effects of increasing drowsiness and impairing balance, co-ordination and concentration. It is more likely to be used as a recreational drug. However cannabis could possibly be used to reduce a competitor's anxiety or to steady their nerves.

WHAT ARE THE RISKS?

In small amounts, cannabis can distort perception of time and space and can impair an athlete's co-ordination, perception and thinking skills. It also increases the heart rate and reduces the oxygen-carrying capacity of the blood. In the first hour after taking cannabis the user's risk of a heart attack quadruples.

Long term use of cannabis has been found to be even more dangerous than smoking tobacco. Marijuana smoke contains 50% more carcinogens (cancer causing chemicals) than tobacco smoke and regular users are more likely to suffer from chest illnesses and breathing problems. Long term marijuana use can lead to addiction for some users and its adverse affect on memory, attention and learning lasts for weeks after the drug is last taken.



Is it banned?

The use of cannabis is prohibited in competition in all sports. Users should be aware that detectable traces of cannabis can remain in the bloodstream for several weeks after it is last used. In the UK, cannabis is a Class C substance meaning that it is a criminal offence to produce, possess or supply it.

For more information see the World Anti-Doping Code list of Prohibited Substances and Methods.

Tobacco

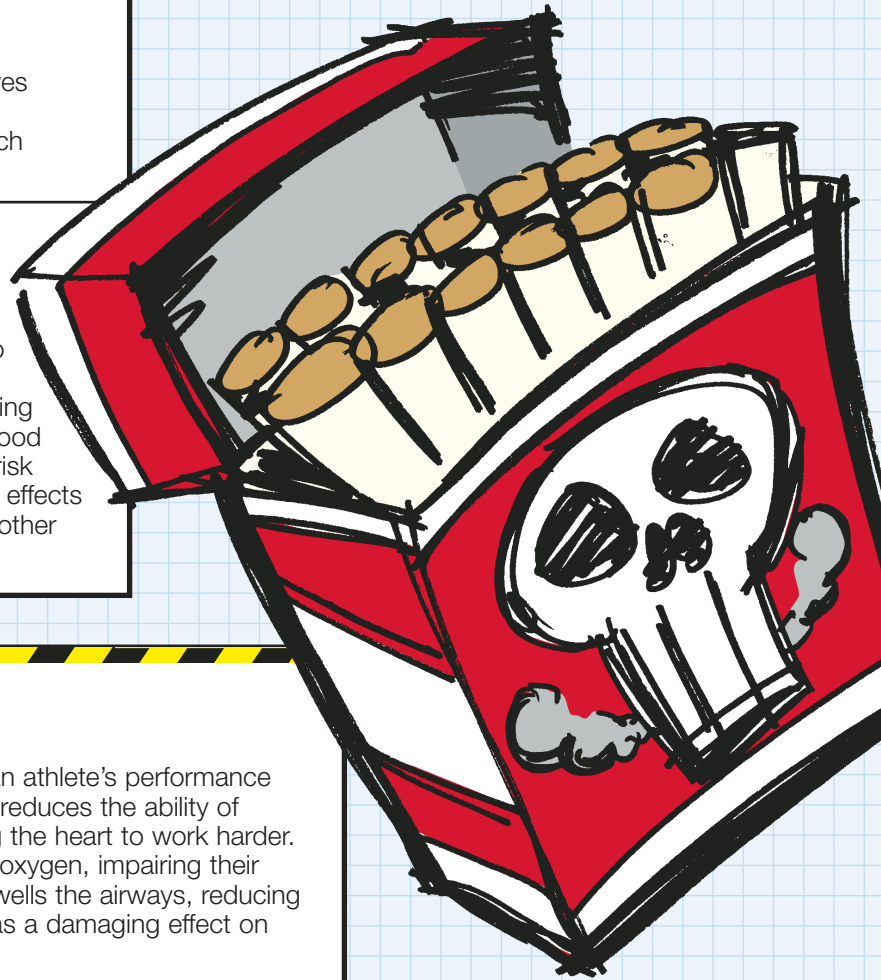
also known as
cigarettes, smoking

What is it?

The tobacco in cigarettes comes from the dried leaves of the tobacco plant. Cigarette smoke contains a cocktail of more than 4,000 chemicals, many of which are extremely poisonous.

Why do some athletes use it?

Very few athletes smoke because they are aware of the damaging effect that smoking has on athletic performance. Smoking is addictive and athletes who smoke may lose up to half of their potential fitness gains from training because of the effects that smoking will have on their oxygen take-up, endurance and blood flow. Even non-smoking athletes put themselves at risk of contracting smoking related diseases through the effects of 'passive' smoking – breathing in the smoke from other people's cigarettes.



WHAT ARE THE RISKS?

The most severe short-term effects of smoking on an athlete's performance are caused by the chemical carbon monoxide. This reduces the ability of blood cells to carry oxygen around the body, forcing the heart to work harder. It also reduces the ability of muscle cells to take up oxygen, impairing their performance. At the same time carbon monoxide swells the airways, reducing the amount of air that the athlete breathes in and has a damaging effect on vision and co-ordination.

Nicotine in cigarettes is highly addictive and also has a seriously damaging effect on athletic performance. It causes an increased heart rate and constriction of the blood vessels which leads to high blood pressure and strain on the heart. Overall, an athlete who smokes is likely to have reduced endurance, to become exhausted more quickly, to have slower reaction times and to suffer from shortness of breath.

Among the better known long-term effects of smoking are the facts that smoking causes a much increased risk of many types of cancers and chest illnesses, and an increased risk of heart disease and strokes. It is less well known that among many other risks, smokers have a higher risk of losing their eyesight, of having hearing problems and of a reduced blood flow to their hands and feet, sometimes making amputation necessary.

Is it banned?

Smoking is permitted in sport as it is unlikely that an athlete would gain any athletic advantage by smoking.

Supplements

also known as herbal and nutritional supplements, vitamins, minerals

What are they?

The use of homeopathic remedies, herbal medicines, vitamins and nutritional supplements has increased greatly over the last few years and there are a wide range of herbal and nutritional supplements on the market aimed both at athletes and the general public. These products are unlicensed which means that their contents are not tested, labelled or controlled strictly as medicines are.

Why do some athletes use them?

Athletes are often keen to supplement their diet with substances that they believe may help to maximise their potential. For example, many athletes take vitamin and mineral supplements believing these could help to 'top up' on any vitamin deficiencies that they suffer from.

WHAT ARE THE RISKS?

An important risk in taking supplements is that these products are unlicensed. This means that the contents may not be labelled accurately and products may contain banned substances through contamination. Manufacturers may not always know exactly what is in the product and contamination may occur because manufacturing and labelling standards are not as strict as they are for licensed medicines.

Further risk may come from the product itself. For example, our vitamin requirements can be met by eating a healthy, balanced diet. Large additional doses of vitamins do not have any beneficial effect on the body and instead may cause a range of side effects such as nausea, diarrhoea and pain.



Are they safe?

It is the responsibility of the athlete to ensure that they don't take banned substances and so the use of supplements is not recommended because no guarantee can be given about the safety or legality of supplements.

For further information about supplements, visit the UK Sport Drug Information Database and click on Supplements.



Blood Doping

What is it?

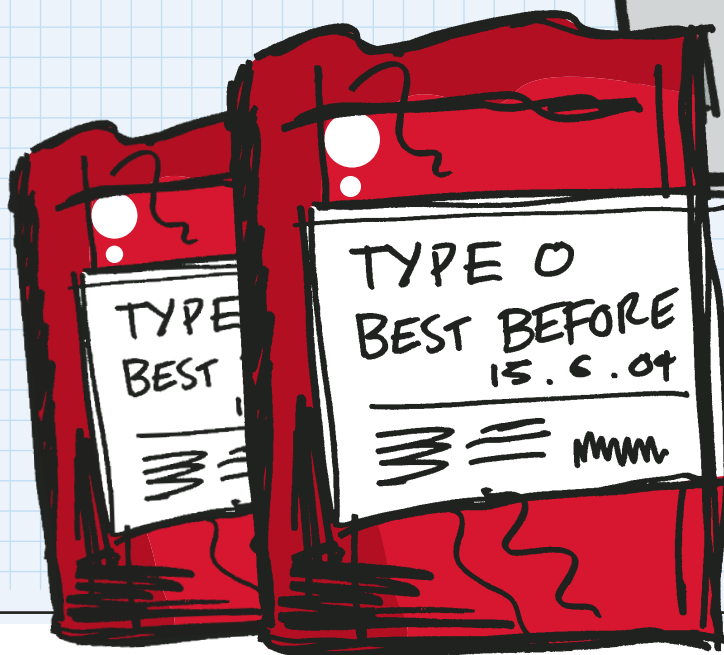
Blood doping is a prohibited technique (not a substance). It involves removing some of the athlete's blood a few months before a competition and storing it. The athlete's blood levels return to normal over time and then about a week before competition the blood is injected back into the athlete's system.

Why do some athletes use it?

The technique increases the amount of red blood cells in the athlete's body, increasing their oxygen-carrying capacity. This can help to improve performance in endurance sports such as cycling and running.

WHAT ARE THE RISKS?

Blood doping can cause blood clots and overload of the blood system, as well as carrying with it the risk of introducing infectious diseases such as HIV and hepatitis.



Is it banned?

Blood doping is banned in all sports.

For further information about blood doping and other prohibited techniques, visit the UK Sport Drug Information Database and click on Fact Sheets.